Package 'r4ss'

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Type Package

Title R code for Stock Synthesis

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Depends R (>= 2.10.0), tcltk, coda

Description Functions for reading output, plotting, exploring and manipulating input files for Richard Methot's Stock Synthesis fisheries stock assessment modeling platform.

License MIT License

LazyLoad yes

URL http://code.google.com/p/r4ss/

Repository CRAN

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R topics documented:

`r4ss-package` *R tools for Stock Synthesis*

Description

A collection of R functions for use with Stock Synthesis, a fisheries stock assessment modeling platform written in ADMB by Dr. Richard D. Methot at the NMFS Northwest Fisheries Science Center. The functions include tools for summarizing and plotting results, manipulating files, visualizing model parameterizations, and various other tasks.

Details

Package:	r4ss
Type:	Package
Version:	1.16
Date:	2011-06-28
License:	MIT license
LazyLoad:	yes
URL:	http://www.r-project.org http://code.google.com/p/r4ss/

Should be compatible with Stock Synthesis versions 3.11, 3.20, and 3.21.

Author(s)

Ian Taylor, Ian Stewart, Allan Hicks, Tommy Garrison, Andre Punt, John Wallace, Chantel Wetzel, and other contributors

Package maintainer: Ian Taylor <Ian.Taylor@noaa.gov>

References

More info on the R code: http://code.google.com/p/r4ss/
Download Stock Synthesis: http://nft.nefsc.noaa.gov/

Examples

```
## Not run:
# source updated files from the web (not always needed, but often helps)
```

```
update_r4ss_files()

# read in the report file using SS_output
myreplist <- SS_output(dir='c:/SS/simple/')

# make a collection of plots using SS_plots
SS_plots(replist=myreplist)

## End(Not run)
```

`addSSsummarize` *Add a model to the list of models to compare*

Description

Adds specified quantities from any model to the list of models returned from `SSsummarize` for further comparison.

Usage

```
addSSsummarize(origModels,newModels)
```

Arguments

`origModels`	A list of models created by `SSsummarize`.
`newModels`	A list of models to add to the originals models list. Each new model is an element of the list, and is a list itself with possible components described in the details below.

Details

The models to add do not need to contain all of the entries. Missing entries are given NA values, so are not plotted. Each model is a list with the following elements:

npars the number of parameters in the model

maxgrad the maximum gradient component (if used)

nsexes the number of sexes

likelihoods likelihoods from the model. A data.frame with the 2nd column as names, which matches on names from origModels. Names which do not match will be added SS uses the following names

- TOTAL
- Equil_catch
- Survey
- Length_comp
- Age_comp
- Recruitment

- recast_Recruitment
- Parm_priors
- Parm_softbounds
- Parm_devs
- Crash_Pen
- Size_at_age

likelambdas NOT IMPLEMENTED

pars NOT IMPLEMENTED YET FOR DIFFICULTY IN MATCHING PARAMETERS

parsSD NOT IMPLEMENTED YET FOR DIFFICULTY IN MATCHING PARAMETERS

parsphases NOT IMPLEMENTED YET FOR DIFFICULTY IN MATCHING PARAMETERS

SpawnBio Spawning biomass matrix

- 1st column is year
- 2nd column is spawning biomass in same units as original models (SS reports female spawning biomass)
- 3rd column is the standard deviation of estimated spawning biomass
- 4th column is a lower bound of the confidence interval to be plotted (say from an MCMC)
- 5th column is an upper bound of the confidence interval to be plotted (say from an MCMC)

Bratio Depletion matrix

- 1st column is year
- 2nd column is depletion
- 3rd column is the standard deviation of depletion (optional)
- 4th column is a lower bound of the confidence interval to be plotted (say from an MCMC)
- 5th column is an upper bound of the confidence interval to be plotted (say from an MCMC)

SPRratio SPR ratio matrix

- 1st column is year
- 2nd column is depletion
- 3rd column is the standard deviation (optional)
- 4th column is a lower bound of the confidence interval to be plotted (say from an MCMC)
- 5th column is an upper bound of the confidence interval to be plotted (say from an MCMC)

recruits Recruitment matrix

- 1st column is year
- 2nd column is recruitment as in original models (SS reports age-0 recruits)
- 3rd column is the standard deviation (optional)
- 4th column is a lower bound of the confidence interval to be plotted (say from an MCMC)
- 5th column is an upper bound of the confidence interval to be plotted (say from an MCMC)

recdevs Recruitment deviate matrix

- 1st column is year

- 2nd column is deviate (matched with original models)

growth NOT IMPLEMENTED

indices Matrix of fits to indices

- 1st column is year
- 2nd column is observed index (data)
- 3rd column is expected index (prediction)
- 4th column is catchability coefficient (q)
- 5th column is standard error of index (total used in fitting)
- 6th column is a likelihood for this point, or enter any value to make sure it plots, or enter NA not to plot the estimate

InitAgeYrs NOT IMPLEMENTED

Value

Returns list as is returned from SSsummarize, but contains additions for the new models.

Note

This function was made to compare TINSS results and SS results, and assumed that you would always start with a list of SS models output from SSsummarize. It has not been tested to see how it works when starting with an empty list.

Author(s)

Allan Hicks

See Also

SSsummarize SSplotComparisons

Examples

```
## Not run:
#####################################
#DO NOT RUN
tinss1 <- list(npars=A$fit$npar,maxgrad=A$fit$maxgrad,nsexes=1,
         SpawnBio=data.frame(c(1964,1965,A$yrs),c(A$sbo,A$sbo,A$sbt)*1e6,0,qnorm(0.025,c(A$so,A$so,A$sbt)*1e6
         Bratio=data.frame(A$yrs,A$sbt/A$sbo,0,qnorm(0.025,A$sbt/A$sbo,0),qnorm(0.975,A$sbt/A$sbo,0)),
          SPRratio=data.frame(A$yr,A$spr,0,qnorm(0.025,A$spr,0),qnorm(0.975,A$spr,0)),
         recruits=data.frame(A$yr,A$nt[,1]*1e6,0,qnorm(0.025,A$nt[,1]*1e5,0),qnorm(0.975,A$nt[,1]*1e6,0)),
         recdevs=data.frame(A$recYrs,A$wt),  #I'm not sure exactly what wt are, but it is important to line them u
         indices = data.frame(A$iyr,1e6*A$yt,1e6*A$qbt,rep(A$q,length(A$iyr)),rep(0.4,length(A$iyr)),rep(0,le
          )
tinss <- list(tinss1,tinss1)   #can add more models here


#add TINSS model to SS models already summarized
SSnTINSS <- addSSsummarize(models,tinss)
mcmcInd <- seq(burnin+1,nrow(A$mc.sbt),thin)
```

```
SSnTINSS$mcmc[[2]] <- data.frame(A$mc.sb0[mcmcInd],A$mc.sbt[mcmcInd,],A$mc.depl[mcmcInd,],A$mc.spr[mcmcInd,],A
names(SSnTINSS$mcmc[[2]]) <- c("SPB_Virgin",paste("SPB",A$yrs,sep="_"),paste("Bratio",A$yrs,sep="_"),paste("SP
 modelnames <- c("SS", "TINSS","TINSS.MLE")

SSplotComparisons(SSnTINSS, legendlabels=modelnames, subplot=2,endyr=2011,mcmcVec=c(T,T,F))
 title(main="MCMC")
SSplotComparisons(SSnTINSS, legendlabels=modelnames, subplot=4,endyr=2011,mcmcVec=c(T,T,F))
 title(main="MCMC")
 ###############################################

## End(Not run)
```

---

bubble3 *Create a bubble plot.*

Description

Bubble plot based on function vaguely based on bubble by Edzer Pebesma in gstat package. By default, positive values have closed bubbles and negative values have open bubbles.

Usage

```
bubble3(x, y, z, col = c(1, 1), maxsize = 3, do.sqrt = TRUE, main = "",
cex.main = 1, xlab = "", ylab = "", minnbubble = 8, xlimextra = 1,
add = FALSE, las = 1, allopen = TRUE)
```

Arguments

x	Vector of x-values.
y	Vector of y-values.
z	Vector of bubble sizes.
col	Vector of two color values for positive and negative bubbles. Default=c(1,1).
maxsize	Size of largest bubble. Default=3.
do.sqrt	Should size be based on the area? (Diameter proportional to sqrt(z)). Default=TRUE.
main	Title of plot. Default="".
cex.main	Charecter expansion for title. Default=1.
xlab	X-axis label.
ylab	Y-axis label.
minnbubble	Minimum number of unique x values below which extra space is added to horizontal axis (to make plot look better). Default = 8.
xlimextra	Extra space (see minnbubble above). Default = 1.
add	Add bubbles to existing plot? Default=FALSE.
las	Style of axis labels (see ?par for more info).
allopen	Should all bubbles be open (instead of just negative values)?

Author(s)

Ian Stewart and Ian Taylor

`DoProjectPlots` *Make plots from Rebuilder program*

Description

Make a set of plots based on output from Andre Punt's Rebuilder program.

Usage

```
DoProjectPlots(dirn="C:/myfiles/",fileN=c("res.csv"),Titles="",
  ncols=200,Plots=list(1:25),Options=list(c(1:9)),LegLoc="bottomright",
  yearmax=-1,Outlines=c(2,2),OutlineMulti=c(2,2),AllTraj=c(1,2,3,4),
  AllInd=c(1,2,3,4,5,6,7),BioType="Spawning biomass",CatchUnit="(mt)",
  BioUnit="(mt)",BioScalar=1,ColorsUsed="default",Labels="default")
```

Arguments

`dirn`	Directory where rebuilder output files are stored.
`fileN`	Vector of filenames containing rebuilder output. Default=c("res.csv").
`Titles`	Titles for plots when using multiple filenames. Default="".
`ncols`	Number of columns to read in output file (fileN). Deafult=200.
`Plots`	List to get specific plots (currently 1 through 8). Default=list(1:25). If there are multiple files, supply a list of vectors, e.g. list(c(1,5),c(2:5))
`Options`	List to get specific strategies in the trajectory plots. Default=list(c(1:9)).If there are multiple files, supply a list of vectors, e.g. list(c(1,5),c(2:5))
`LegLoc`	Location for the legend (for plots with a legend). Default="bottomright".
`yearmax`	Maximum year to show in the plots. Set negative to show all years. Default=-1.
`Outlines`	Number of rows, columns for some of the plots. Default=c(2,2).
`OutlineMulti`	Number of rows, columns for other plots. Default=c(2,2).
`AllTraj`	Vector of trajectories to show. Default=c(1,2,3,4).
`AllInd`	Vector of individual plots to show. Default=c(1,2,3,4,5,6,7).
`BioType`	Label for biomass type. Default="Spawning biomass".
`CatchUnit`	Units of catch. Default="(mt)".
`BioUnit`	Units of biomass. Default="(mt)".
`BioScalar`	Scalar for biomass plot. Default=1.
`ColorsUsed`	Optional vector for alternative line colors. Default="default".
`Labels`	Optional vector for alternative legend labels. Default="default".

Author(s)

Andre Punt

Examples

```
## Not run:
# example with one file
 DoProjectPlots(dirn="c:/myfiles/", Plots=1:8,
                Options=c(1,2,3,4,5,9), LegLoc="bottomleft")

# example with multiple files
 # Plots - set to get specific plots
 # Options - set to get specific strategies in the trajectory plots

 Titles <- c("Res1","Res2","Res3")
 Plots <- list(c(1:9),c(6:7))
 Options <- list(c(7:9,3),c(5,7))
 DoProjectPlots(fileN=c("res1.csv","res2.csv"),Titles=Titles,Plots=Plots,
                Options=Options,LegLoc="bottomleft",yearmax=-1,
                Outlines=c(2,2),OutlineMulti=c(3,3),AllTraj=c(1:4),
                AllInd=c(1:7),BioType="Spawning numbers",BioUnit="(lb)",
                BioScalar=1000,CatchUnit="(lb)",
                ColorsUse=rep(c("red","blue"),5),
                Labels=c("A","B","C","D","E","F"))

## End(Not run)
```

`IOTCmove` *Make a map of movement for a 5-area Indian Ocean model*

Description

Run the `SSplotMovementMap` function with defaults related to a 5-area model for tunas in the Indian Ocean as discussed at the Indian Ocean Tuna Commission Working Party on Tropical Tunas in October, 2010. Obviously this is not useful for the majority of r4ss users, but it could serve as an example of how a wrapper function might be written for any other model.

Usage

```
IOTCmove(replist=NULL, moveage=5, moveseas=1, legend=FALSE, title=NULL)
```

Arguments

`replist`	optional list created by `SS_output`
`moveage`	age for which movemement rates will be represented
`moveseas`	season for which movement rates will be represented
`legend`	add a legend to show the movement rate associated with the widest arrows
`title`	optional title to be added above map

Author(s)

Ian Taylor

`make_multifig` *Create multi-figure plots.*

Description

Function created as an alternative to lattice package for multi-figure plots of composition data and fits from Stock Synthesis output.

Usage

```
make_multifig(ptsx, ptsy, yr, linesx = 0, linesy = 0, ptsSD = 0,
sampsize = 0, effN = 0, showsampsize = TRUE, showeffN = TRUE,
sampsizeround = 1, maxrows = 6, maxcols = 6, rows = 1, cols = 1,
fixdims = TRUE, main = "", cex.main = 1, xlab = "", ylab = "",
size = 1, maxsize = 3, do.sqrt = TRUE, minnbubble = 8, allopen = TRUE,
horiz_lab = "default", xbuffer = c(0.1, 0.1), ybuffer = c(0, 0.15),
ymin0 = TRUE, axis1 = "default", axis2 = "default", linepos = 1,
type = "o", bars = FALSE, barwidth = "default", ptscex = 1, ptscol = 1,
ptscol2 = 1, linescol = 2, lty = 1, lwd = 1, pch = 1, nlegends = 3,
legtext = list("yr","sampsize", "effN"), legx = "default",
legy = "default", legadjx = "default", legadjy = "default",
legsize = c(1.2, 1), legfont = c(2, 1), ipage = 0, scalebins = FALSE)
```

Arguments

`ptsx`	vector of x values for points or bars
`ptsy`	vector of y values for points or bars of same length as ptsx
`yr`	vector of category values (years) of same length as ptsx
`linesx`	optional vector of x values for lines
`linesy`	optional vector of y values for lines
`ptsSD`	optional vector of standard deviations used to plot error bars on top of each point under the assumption of normally distributed error
`sampsize`	optional sample size vector of same length as ptsx
`effN`	optional effective sample size vector of same length as ptsx
`showsampsize`	show sample size values on plot?
`showeffN`	show effective sample size values on plot?
`sampsizeround`	rounding level for sample size values
`maxrows`	maximum (or fixed) number or rows of panels in the plot
`maxcols`	maximum (or fixed) number or columns of panels in the plot
`rows`	number or rows to return to as default for next plots to come or for single plots

cols	number or cols to return to as default for next plots to come or for single plots
fixdims	fix the dimensions at maxrows by maxcols or resize based on number of elements in yr input.
main	title of plot
cex.main	character expansion for title
xlab	x-axis label
ylab	y-axis label
size	vector of bubbles sizes if making a bubble plot
maxsize	maximum size of bubbles
do.sqrt	scale bubbles based on sqrt of size vector. see ?bubble3 for more info.
minnbubble	number of unique x values before adding buffer. see ?bubble3 for more info.
allopen	should all bubbles be open? see ?bubble3 for more info.
horiz_lab	axis labels set horizontal all the time (TRUE), never (FALSE) or only when relatively short ("default")
xbuffer	extra space around points on the left and right as fraction of total width of plot
ybuffer	like xbuffer
ymin0	fix minimum y-value at 0?
axis1	position of bottom axis values
axis2	position of left size axis values
linepos	should lines be added on top of points (linepos=1) or behind (linepos=2)?
type	type of line/points used for observed values (see 'type' in ?plot for details) on top of a grey polygon. Default is "o" for overplotting points on lines.
bars	should the ptsx/ptsy values be bars instead of points (TRUE/FALSE)
barwidth	width of bars in barplot, default method chooses based on quick and dirty formula also, current method of plot(...type='h') could be replaced with better approach
ptscex	character expansion factor for points (default=1)
ptscol	color for points/bars
ptscol2	color for negative value points in bubble plots
linescol	color for lines
lty	line type
lwd	line width
pch	point character type
nlegends	number of lines of text to add as legends in each plot
legtext	text in legend, a list of length=nlegends. values may be any of 1. "yr", 2. "sampsize", 3. "effN", or a vector of length = ptsx.
legx	vector of length=nlegends of x-values of legends (default is first one on left, all after on right)
legy	vector of length=nlegends of y-values of legends (default is top for all plots)

legadjx	left/right adjustment of legends around legx
legadjy	left/right adjustment of legends around legy
legsize	font size for legends. default=c(1.2,1.0) (larger for year and normal for others)
legfont	font type for legends, same as "font" under ?par
ipage	which page of plots when covering more than will fit within maxrows by maxcols.
scalebins	Rescale expected and observed proportions by dividing by bin width for models where bins have different widths? Caution!: May not work correctly in all cases.

Author(s)

Ian Taylor

`mcmc.nuisance` *Summarize nuisance MCMC output*

Description

Summarize nuisance MCMC output (used in combination with `mcmc.out` for key parameters).

Usage

```
mcmc.nuisance(directory = "c:/mydirectory/", run = "mymodel/",
file = "posteriors.sso", file2 = "derived_posteriors.sso",
bothfiles = FALSE, printstats = FALSE, burn = 0, header = F, thin = 1,
trace = 0, labelstrings = "all", columnnumbers = "all", sep = "")
```

Arguments

directory	Directory where all results are located, one level above directory for particular run.
run	Directory with files from a particular run.
file	File containing posterior samples for nuisance parameters. This could be posteriors.sso or something written by the function `SSgetMCMC`.
file2	Optional second file containing posterior samples for nuisance parameters. This could be derived_posteriors.sso.
bothfiles	TRUE/FALSE indicator on whether to read `file2` in addition to `file1`.
printstats	Return all the statistics for a closer look.
burn	Optional burn-in value to apply on top of the option in the starter file and `SSgetMCMC`.
header	Data file with header?
thin	Optional thinning value to apply on top of the option in the starter file, in the `mcsave` runtime command, and in `SSgetMCMC`.

trace	Plot trace for param # (to help sort out problem parameters).
labelstrings	Vector of strings that partially match the labels of the parameters you want to consider.
columnnumbers	Vector of column numbers indicating the columns you want to consider.
sep	Separator for data file passed to the read.table function.

Author(s)

Ian Stewart

See Also

mcmc.out, SSgetMCMC

---

mcmc.out *Summarize, analyze and plot key MCMC output.*

Description

Makes four panel plot showing trace plots, moving average, autocorrelations, and densities for chosen parameters from MCMC output.

Usage

```
mcmc.out(directory = "c:/mydirectory/", run = "mymodel/",
file = "keyposteriors.sso", namefile = "postplotnames.sso",
names = FALSE, headernames = TRUE, numparams = 1, closeall = TRUE,
burn = 0, thin = 1, scatter = FALSE, surface = FALSE, surf1 = 1,
surf2 = 2, stats = FALSE, plots = TRUE, header = F, sep = "",
print = FALSE)
```

Arguments

directory	Directory where all results are located, one level above directory for particular run.
run	Directory with files from a particular run.
file	File containing posterior samples for key parameters. This could be written by the function SSgetMCMC.
namefile	The (optional) file name of the dimension and names of posteriors.
names	Read in names file (T) or use generic naming (F).
headernames	Use the names in the header of file?
numparams	The number of parameters to analyze.
closeall	By default close all open devices.

burn	Optional burn-in value to apply on top of the option in the starter file and SSgetMCMC.
thin	Optional thinning value to apply on top of the option in the starter file, in the -mcsave runtime command, and in SSgetMCMC.
scatter	Can add a scatter-plot of all params at end, default is none.
surface	Add a surface plot of 2-way correlations.
surf1	The first parameter for the surface plot.
surf2	The second parameter for the surface plot.
stats	Print stats if desired.
plots	Show plots or not.
header	Data file with header?
sep	Separator for data file passed to the read.table function.
print	Send to screen unless asked to print.

Author(s)

Ian Stewart

See Also

mcmc.nuisance, SSgetMCMC

---

mountains *Make shaded polygons with a mountain-like appearance*

Description

Designed to replicate like the cool-looking Figure 7 in Butterworth et al. (2003).

Usage

```
mountains(zmat, xvec=NULL, yvec=NULL, zscale=3, nshades=100,
          xaxs='i', yaxs='i', xlab="", ylab="", las=1, addbox=FALSE, ...)
```

Arguments

zmat	a matrix where the rows represent the heights of each mountain range
xvec	optional input for the x variable
yvec	optional input for the y variable
zscale	controls the height of the mountains relative to the y-axis and max(zmat)
nshades	number of levels of shading
xaxs	x-axis as internal or regular (see ?par for details)
yaxs	y-axis as internal or regular (see ?par for details)

xlab	optional label for x-axis
ylab	optional label for y-axis
las	axis label style (see ?par for details). Default = 1 = horizontal axis labels.
addbox	puts a box around the whole plot
...	extra inputs passed to the plot command

Author(s)

Ian Taylor

References

Butterworth D.S., Ianelli J.N., Hilborn R. (2003) A statistical model for stock assessment of southern bluefin tuna with temporal changes in selectivity. South African Journal of Marine Science 25:331-362.

---

movepars *explore movement parameterizations*

Description

A function to visualize parameterization of movement in Stock Synthesis. It creates a GUI interface for movement exploration.

Usage

```
movepars(nareas = 4, accuage = 40, getpars = T, getrates = T)
```

Arguments

nareas	Number of areas
accuage	Accumulator age
getpars	T/F switch to get chosen parameters as output
getrates	T/F switch to get derived movement rates as output

Author(s)

Ian Taylor

plotCI *Plot points with confidence intervals.*

Description

Given a set of x and y values and upper and lower bounds, this function plots the points with error bars. This was Written by Venables and modified to add access to ylim and contents.

Usage

```
plotCI(x, y = NULL, uiw, liw = uiw, ylo = NULL, yhi = NULL, ...,
sfrac = 0.01, ymax = NULL, add = FALSE, col = "black")
```

Arguments

x	The x coordinates of points in the plot
y	The y coordinates of the points in the plot.
uiw	The width of the upper portion of the confidence region.
liw	The width of the lower portion of the confidence region.
ylo	Lower limit of y range.
yhi	Upper limit of y range.
...	Additional inputs that will be passed to the function `plot(x,y,ylim=ylim,...)`
sfrac	Fraction of width of plot to be used for bar ends.
ymax	Additional input for Upper limit of y range.
add	Add points and intervals to existing plot? Default=FALSE.
col	Color for the points and lines.

Author(s)

Bill Venables, Ian Stewart, Ian Taylor, John Wallace

rich.colors.short *Make a vector of colors.*

Description

A subset of rich.colors by Arni Magnusson from the gplots package, with the addition of alpha transparency.

Usage

```
rich.colors.short(n, alpha = 1)
```

Arguments

n	Number of colors to generate.
alpha	Alpha transparency value for all colors in vector. Value is passed to rgb function.

Author(s)

Arni Magnusson, Ian Taylor

---

sel.line *a function for drawing selecitivity curves*

Description

This function is primarily inteded for use by the selfit function.

Usage

```
sel.line(x, model, sp, min.dist, max.dist)
```

Arguments

x	vector of x values (age or length)
model	selectivity model "Double_Normal" or "Double_Logistic"
sp	vector of parameters
min.dist	minimum value for selectivity
max.dist	maximum value for selectivity

Author(s)

Tommy Garrison

See Also

selfit

Examples

```
## Not run:
plot(0, xlim = c(0, 50), ylim = c(0, 1),
xlab = 'Length', ylab = 'Selectivity', type = 'n',
xaxs = 'i', yaxs = 'i')
sel.line(model = 'Double_Normal', min.dist = 10, max.dist = 50,
sp = c(25, -0.5, 3, 3, -5, 0))

## End(Not run)
```

selfit *A function to visual parameterization of double normal and double logistic selectivity in Stock Synthesis*

Description

A GUI interface for exploring selectivity.

Usage

```
selfit(minLength = 10, maxLength = 65, silent = FALSE)
```

Arguments

minLength	Minimum size to show
maxLength	Maximum size to show
silent	T/F switch to return fit at the end

Author(s)

Tommy Garrison

See Also

sel.line

Examples

```
## Not run:
selfit()

## End(Not run)
```

SSFishGraph *A function for converting Stock Synthesis output to the format used by FishGraph*

Description

Only skeleton of a function right now, needs work. Intended as a translator to convert the output from object created by SS_output to the format used by FishGraph.

Usage

```
SSFishGraph(replist, title = "SSv3 output",
species = "some kind of fish")
```

Arguments

replist	Object created by SS_output
title	Title of output
species	Species name

Author(s)

Ian Taylor

References

A website related to FishGraph is http://r-forge.r-project.org/projects/fishgraph/

SSgetMCMC *Read MCMC output.*

Description

Reads the MCMC output (in the posteriors.sso and derived_posteriors.sso files) from one or more models.

Usage

```
SSgetMCMC(dir = NULL, verbose = TRUE, writecsv = FALSE,
csv1 = "keyposteriors.csv", csv2 = "nuisanceposteriors.csv",
keystrings = c("NatM", "R0", "steep", "RecrDev_2008", "Q_extraSD"),
nuisancestrings = c("Objective_function", "SPB_", "InitAge", "RecrDev"),
modelnames = "default", burnin = 0, thin = 1)
```

Arguments

dir	A string (or vector of strings) of the directory (or directories) with MCMC output.
verbose	TRUE/FALSE switch to get more or less information about the progress of the function.
writecsv	Write key parameters and certainty nuisance quantities to a CSV file.
csv1	First CSV file for key parameters.
csv2	Second CSV file for nuisance quantities.
keystrings	Vector of strings that partially match parameter names to write to the file csv1. This file intended to feed into mcmc.out.
nuisancestrings	Vector of strings that partially match derived quantity names to write to the file csv2. This file intended to feed into mcmc.nuisance.
modelnames	Either "default" or a vector of names to use in naming elements of list that is output by the function. Default is "model1", "model2", etc.

burnin	Optional burn-in value to apply on top of the option in the starter file.
thin	Optional thinning value to apply on top of the option in the starter file and in the -mcsave runtime command.

Author(s)

Ian Taylor

See Also

mcmc.out, mcmc.nuisance, SSplotPars

SSgetoutput *Get output from multiple Stock Synthesis models.*

Description

Apply the function SS_output multiple times and save output as individual objects or a list of lists.

Usage

```
SSgetoutput(keyvec = NULL, dirvec = NULL, getcovar = TRUE, getcomp = TRUE,
forecast = FALSE, verbose = TRUE, ncols = 210, global = FALSE, replace =
FALSE, listlists = TRUE, underscore=FALSE)
```

Arguments

keyvec	A vector of strings that are appended to the output files from each model if models are all in one directory. Default=NULL.
dirvec	A vector of directories (full path or relative to working directory) in which model output is located. Default=NULL.
getcovar	Choice to read or not read covar.sso output (saves time and memory). Default=TRUE.
getcomp	Choice to read or not read CompReport.sso output (saves time and memory). Default=TRUE.
forecast	Choice to read or not read forecast quantities. Default=FALSE.
verbose	Print various messages to the command line as the function runs? Default=TRUE.
ncols	Maximum number of columns in Report.sso (same input as for SS_output). Default=210.
global	Save output from each model as a global variable with a unique name. Default=FALSE.
replace	Replace existing global variables if they already exist. Default=FALSE.
listlists	Save output from each model as a element of a list (i.e. make a list of lists). Default = TRUE.
underscore	Add an underscore '_' between any file names and any keys in keyvec. Default=FALSE.

Author(s)

Ian Taylor

See Also

SS_output SSrunsims SSsummarize

SSmakesims *Make files and set up folders for simulations*

Description

This is less general than other functions in this package, but is put here for Ian Taylor's convenience and may be useful for others, especially if they adapt it to their own needs

Usage

```
SSmakesims(copymasters=TRUE, makecases=FALSE, olddir=NULL, newdir=NULL,
         exe="ss3.exe", steep=FALSE, M=FALSE, CV=FALSE, trend=FALSE)
```

Arguments

copymasters	Switch for whether to copy master data and control files to new directory. Default=TRUE.
makecases	Switch for whether to create ctl files for individual cases. Default=FALSE.
olddir	Optional old directory from which to copy files. Default = NULL = current working directory.
newdir	Optional new directory to put files in. Default = NULL = current working directory.
exe	Name of Stock Synthesis executable. Default="ss3.exe".
steep	Estimate steepness? Default=FALSE.
M	Estimate natural mortality? Default=FALSE.
CV	Estimate CV in growth? Default=FALSE.
trend	Create files for trend in selectivity? Default=FALSE.

Author(s)

Ian Taylor

See Also

SSgetoutput SSsummarize SSrunsims

SSplotBiology *Plot biology related quantities.*

Description

Plot biology related quantities from Stock Synthesis model output, including mean weight, maturity, fecundity, and spawning output.

Usage

```
SSplotBiology(replist,
 plot=TRUE,print=FALSE,add=FALSE,subplots=1:10,seas=1,
 col1="red",col2="blue",
 legendloc="topleft",
 plotdir="default",
 labels=c("Length (cm)",
   "Age (yr)",
   "Maturity",
   "Mean weight (kg) in last year",
   "Spawning output",
   "Length (cm, middle of the year)",
   "Natural mortality",
   "Female weight (kg)",
   "Female length (cm)",
   "Fecundity",
   "Default fecundity label"),
 pwidth=7,pheight=7,punits="in",res=300,ptsize=12,cex.main=1,
 verbose=TRUE)
```

Arguments

replist	list created by SS_output
plot	plot to active plot device?
print	print to PNG files?
add	add to existing plot
subplots	vector controlling which subplots to create
seas	which season to plot (obviously only works in seasonal models, but maybe not fully implemented even then)
col1	color of some points/lines
col2	color of other points/lines
legendloc	location of legend (see ?legend for more info)
plotdir	directory where PNG files will be written. by default it will be the directory where the model was run.
labels	vector of labels for plots (titles and axis labels)

pwidth	width of plot written to PNG file
pheight	height of plot written to PNG file
punits	units for PNG file
res	resolution for PNG file
ptsize	ptsize for PNG file
cex.main	character expansion for plot titles
verbose	return updates of function progress to the R GUI?

Author(s)

Ian Stewart, Ian Taylor

See Also

SS_plots, SS_output

SSplotCatch *Plot catch related quantities.*

Description

Plot catch related quantities from Stock Synthesis output. Plots include harvest rate, continuous F, landings, and discard fraction.

Usage

```
SSplotCatch(replist, subplots = 1:15, add = FALSE, areas = 1,
plot = TRUE, print = FALSE, type = "l", fleetlty = 1,
fleetpch = 1, fleetcols = "default", fleetnames = "default", lwd = 3,
areacols = "default", areanames = "default", minyr = NULL, maxyr = NULL,
annualcatch = TRUE, forecastplot = TRUE, plotdir = "default",
showlegend = TRUE, legendloc = "topleft", xlab = "Year",
labels = c("Harvest rate/Year", "Continuous F", "Landings",
"Total catch", "Predicted Discards", "Discard fraction", "(mt)",
"(numbers x1000)", "Observed and expected",
"aggregated across seasons"),
catchasnumbers = FALSE, pwidth = 7, pheight = 7, punits = "in",
res = 300, ptsize = 12, cex.main = 1, verbose = TRUE)
```

Arguments

replist	list created by SS_output
subplots	vector controlling which subplots to create
add	add to existing plot? (not yet implemented)
areas	optional subset of areas to plot for spatial models

plot	plot to active plot device?
print	print to PNG files?
type	type parameter passed to plot function. Default "l" is lines only. Other options include "o" for overplotting points on lines.
fleetlty	vector of line type by fleet
fleetpch	vector of plot character by fleet
fleetcols	vector of colors by fleet
fleetnames	optional replacement for fleenames used in data file
lwd	line width
areacols	vector of colors by area. Default uses rich.colors by Arni Magnusson
areanames	names for areas. Default is to use Area1, Area2,...
minyr	optional input for minimum year to show in plots
maxyr	optional input for maximum year to show in plots
annualcatch	include plot of catch aggregated across seasons within each year
forecastplot	add points from forecast years
plotdir	directory where PNG or PDF files will be written. by default it will be the directory where the model was run.
showlegend	put legend on plot
legendloc	location of legend (see ?legend for more info)
xlab	x-label for all plots
labels	vector of labels for plots (titles and axis labels)
catchasnumbers	is catch in numbers instead of biomass?
pwidth	width of plot written to PNG file
pheight	height of plot written to PNG file
punits	units for PNG file
res	resolution for PNG file
ptsize	ptsize for PNG file
cex.main	character expansion for plot titles
verbose	report progress to R console?

Author(s)

Ian Taylor, Ian Stewart

See Also

SS_plots, SS_output

SSplotComparisons *plot model comparisons*

Description

Creates a user-chosen set of plots comparing model output from a summary of multiple models, where the collection was created using the SSsummarize function.

Usage

```
SSplotComparisons(summaryoutput,subplots=1:14,
  plot=TRUE,print=FALSE,
  models="all",
  endyrvec=NULL,
  indexfleets=NULL,
  indexUncertainty=FALSE,
  indexQlabel = TRUE,
  indexQdigits = 4,
  indexSEvec="default",
  indexPlotEach=FALSE,
  labels=c("Year",
    "Spawning biomass (mt)",
    "Spawning depletion",
    "Age-0 recruits (1,000s)",
    "Recruitment deviations",
    "Index",
    "Log index",
    "Density"),
  col="default", shadecol="default",
  pch="default", lty=1, lwd=2,
  spacepoints = 10, staggerpoints = 1,
  xlim="default", xaxs="r", yaxs="r",
  type="o", uncertainty=TRUE, shadealpha=0.1,
  legend=TRUE, legendlabels="default", legendloc="topright",
  btarg=0.4, minbthresh=0.25,
  pwidth=7,pheight=7,punits="in",res=300,ptsize=12,cex.main=1,
  plotdir=NULL,
  densitynames=c("SPB_Virgin",
                 "SPB_2011",
                 "Bratio_2011",
                 "SR_R0",
                 "SR_LN(R0)",
                 "TotYield_MSY"),
  densityxlabs=c("B0 (mt)",
                 "Spawning Biomass in 2011 (mt)",
                 "depletion in 2011",
                 "log(R0)",
```

```
                "MSY (mt)"),
  densityscalex=1,
  densityscaley=1,
  fix0=TRUE,
  new=TRUE,
  verbose=TRUE,
  mcmcVec="default")
```

Arguments

summaryoutput	list created by SSsummarize
subplots	Vector of subplots to be created.
plot	plot to active plot device?
print	send plots to PNG files in directory specified by plotdir
models	optional subset of the models described in summaryoutput. Either "all" or a vector of numbers indicating columns in summary tables.
endyrvec	optional single year or vector of years representing the final year of values to show for each model
indexfleets	vector of fleets for each model for which to compare indices of abundance. Only necessary if any model has more than one index.
indexUncertainty	show uncertainty intervals on index data? Default=FALSE because if models have any extra standard deviations added, these intervals may differ across models.
indexQlabel	add catchability to legend in plot of index fits (TRUE/FALSE)?
indexQdigits	number of significant digits for catchability in legend (if indexQlabel=TRUE)
indexSEvec	optional replacement for the SE values in summaryoutput$indices to deal with the issue of differing uncertainty by models described above.
indexPlotEach	TRUE plots the observed index for each model with colors, or FALSE just plots observed once in black dots.
labels	vector of labels for plots (titles and axis labels)
col	optional vector of colors to be used for lines. Input 'default' makes use of rich.colors.short function.
shadecol	optional vector of colors to be used for shading uncertainty intervals. Input 'default' makes use of rich.colors.short function with alpha transparency.
pch	optional vector of plot character values
lty	optional vector of line types
lwd	optional vector of line widths
spacepoints	number of years between points shown on top of lines (for long timeseries, points every year get mashed together)
staggerpoints	number of years to stagger the first point (if spacepoints > 1) for each line (so that adjacent lines have points in different years)
xlim	optional x limits

xaxs	choice of xaxs parameter (see ?par for more info)
yaxs	choice of yaxs parameter (see ?par for more info)
type	type parameter passed to points (default 'o' overplots points on top of lines)
uncertainty	show plots with uncertainty intervals
shadealpha	transparency parameter used to make default shadecol values (see ?rgb for more info)
legend	add a legend?
legendlabels	optional vector of labels to include in legend. Default is 'model1','model2',etc.
legendloc	location of legend. See ?legend for more info.
btarg	target biomass value at which to show a line (set to 0 to remove)
minbthresh	minimum biomass threshhold at which to show a line (set to 0 to remove)
pwidth	width of plot written to PNG file
pheight	height of plot written to PNG file
punits	units for PNG file
res	resolution for PNG file
ptsize	ptsize for PNG file
cex.main	character expansion for plot titles
plotdir	directory where PNG or PDF files will be written. By default it will be the directory where the model was run.
densitynames	vector of names of parameters or derived quantities contained in summaryoutput$pars$Label or summaryoutput$quants$Label for which to make density plots
densityxlabs	vector of x-axis labels to use in the density plots (must be equal in length to densitynames)
densityscalex	scalar for upper x-limit in density plots (values below 1 will cut off the right tail to provide better contrast among narrower distributions
densityscaley	scalar for upper y-limit in density plots (values below 1 will cut off top of highest peaks to provide better contrast among broader distributions
fix0	always include 0 in the density plots?
new	create new empty plot window
verbose	report progress to R GUI?
mcmcVec	vector of TRUE/FALSE values (or single value) indicating whether input values are from MCMC or to use normal distribution around MLE

Author(s)

Ian Taylor

See Also

SS_plots, SSsummarize, SS_output, SSgetoutput

SSplotComps *Plot composition data and fits.*

Description

Plot composition data and fits from Stock Synthesis output. Mult-figure plots depend on make_multifig.

Usage

```
SSplotComps(replist, subplots=1:11,
  kind="LEN", sizemethod=1, aalyear=-1, aalbin=-1, plot=TRUE,
  print=FALSE, fleets="all", fleetnames="default", sexes="all",
  datonly=FALSE, samplesizeplots=TRUE, compresidplots=TRUE, bub=FALSE,
  showsampsize=TRUE, showeffN=TRUE, minnbubble=8, pntscalar=2.6,
  pwidth=7, pheight=7, punits="in", ptsize=12, res=300,
  plotdir="default", cex.main=1, linepos=1, fitbar=FALSE, maxsize=3,
  do.sqrt=TRUE, smooth=TRUE, cohortlines=c(),
  labels = c("Length (cm)",
             "Age (yr)",
             "Year",
             "Observed sample size",
             "Effective sample size",
             "Proportion",
             "cm",
             "Frequency",
             "Weight",
             "Length",
             "(mt)",
             "(numbers x1000)",
             "Stdev (Age) (yr)",
             "Andre's conditional AAL plot, "),
  printmkt=TRUE,printsex=TRUE,
  maxrows=6,maxcols=6,maxrows2=2,maxcols2=4,rows=1,cols=1,
  fixdims=TRUE,fixdims2=FALSE,maxneff=5000,verbose=TRUE,
  scalebins=FALSE,...)
```

Arguments

replist	list created by SSoutput
subplots	vector controlling which subplots to create
kind	indicator of type of plot can be "LEN", "SIZE", "AGE", "cond", "GSTAGE", "L@A", or "W@A".
sizemethod	if kind = "SIZE" then this switch chooses which of the generalized size bin methods will be plotted.

aalyear	Years to plot multi-panel conditional age-at-length fits for all length bins; must be in a "c(YYYY,YYYY)" format. Useful for checking the fit of a dominant year class, critical time period, etc. Default=-1.
aalbin	The length bin for which multi-panel plots of the fit to conditional age-at-length data will be produced for all years. Useful to see if growth curves are ok, or to see the information on year classes move through the conditional data. Default=-1.
plot	plot to active plot device?
print	print to PNG files?
fleets	optional vector to subset fleets for which plots will be made
fleetnames	optional vector of fleet names to put in the labels
sexes	which sexes to show plots for. Default="all" which will include males, females, and unsexed. This options is not fully implemented for all plots.
datonly	make plots of data without fits as well as data with fits?
samplesizeplots	make sample size plots?
compresidplots	make plots of residuals for fit to composition data?
bub	make bubble plot for numbers at age or size?
showsampsize	add sample sizes to plot
showeffN	add effective sample sizes to plot
minnbubble	number of unique x values before adding buffer. see ?bubble3 for more info.
pntscalar	maximum bubble size for bubble plots; each plot scaled independently based on this maximum size and the values plotted. Often some plots look better with one value and others with a larger or smaller value. Default=2.6
pwidth	default width of plots printed to files in units of punits. Default=7.
pheight	default height width of plots printed to files in units of punits. Default=7.
punits	units for pwidth and pheight. Can be "px" (pixels), "in" (inches), "cm" or "mm". Default="in".
ptsize	point size for plotted text in plots printed to files (see help("png") in R for details). Default=12.
res	resolution of plots printed to files. Default=300
plotdir	directory where PNG files will be written. by default it will be the directory where the model was run.
cex.main	character expansion parameter for plot titles
linepos	should lines be added before points (linepos=1) or after (linepos=2)?
fitbar	show fit to bars instead of points
maxsize	maximum size of bubble plots
do.sqrt	scale bubbles based on sqrt of size vector. see ?bubble3 for more info.
smooth	add loess smoother to observed vs. expected index plots and input vs. effective sample size?

cohortlines	optional vector of birth years for cohorts for which to add growth curves to numbers at length bubble plots
labels	vector of labels for plots (titles and axis labels)
printmkt	show market categories in plot titles?
printsex	show gender in plot titles?
maxrows	maximum (or fixed) number or rows of panels in the plot
maxcols	maximum (or fixed) number or columns of panels in the plot
maxrows2	maximum number of rows for conditional age at length plots
maxcols2	maximum number of columns for conditional age at length plots
rows	number or rows to return to as default for next plots to come or for single plots
cols	number or cols to return to as default for next plots to come or for single plots
fixdims	fix the dimensions at maxrows by maxcols or resize based on number of years of data
fixdims2	fix the dimensions at maxrows by maxcols in aggregate plots or resize based on number of fleets
maxneff	the maximum value to include on plots of input and effective sample size. Occasionally a calculation of effective N blows up to very large numbers, rendering it impossible to observe the relationship for other data. Default=5000.
verbose	return updates of function progress to the R GUI?
scalebins	Rescale expected and observed proportions by dividing by bin width for models where bins have different widths? Caution!: May not work correctly in all cases.
...	additional arguments that will be passed to the plotting.

Author(s)

Ian Taylor

SSplotData *Timeline of presence/absence of data by type, year, and fleet.*

Description

Plot shows graphical display of what data is being used in the model. Some data types may not yet be included. Note, this is based on output from the model, not the input data file.

Usage

```
SSplotData(replist, plot=TRUE,print=FALSE,
  plotdir="default", fleetcol="default",
  datatypes="all",fleets="all",fleetnames="default",ghost=FALSE,
  pwidth=7,pheight=7,punits="in",res=300,ptsize=12,cex.main=1,
  margins = c(5.1,2.1,4.1,8.1), verbose=TRUE)
```

Arguments

replist	list created by SS_output
plot	plot to active plot device?
print	print to PNG files?
plotdir	directory where PNG files will be written. by default it will be the directory where the model was run.
fleetcol	Either the string "default", or a vector of colors to use for each fleet.
datatypes	Either the string "all", or a vector including some subset of the following: "catch", "cpue", "lendbase", "sizedbase", "agedbase", "condbase", "ghostagedbase", "ghostcondbase", "ghostlendbase", "ladbase", "wadbase", "mnwgt", "discard", "tagdbase1", "tagdbase2".
fleets	Either the string "all", or a vector of numerical values, like c(1,3), listing fleets or surveys to be included in the plot.
fleetnames	A vector of alternative names to use in the plot. By default the parameter names in the data file are used.
ghost	TRUE/FALSE indicator for whether to show presence of composition data from ghost fleets (data for which the fit is shown, but is not included in the likelihood calculations).
pwidth	width of plot written to PNG file
pheight	height of plot written to PNG file
punits	units for PNG file
res	resolution for PNG file
ptsize	ptsize for PNG file
cex.main	character expansion for plot titles
margins	margins of plot (passed to par() function), which may need to be increased if fleet names run off right-hand margin
verbose	report progress to R GUI?

Author(s)

Ian Taylor, Chantel Wetzel

See Also

SS_plots, SS_output, SS_readdat

SSplotDiscard *Plot fit to discard fraction.*

Description

Plot fit to discard fraction from Stock Synthesis output file.

Usage

```
SSplotDiscard(replist, add = FALSE, plot = TRUE, print = FALSE,
plotdir = "default", fleets = "all", fleetnames = "default",
labels = c("Year", "Discard fraction", "Total discards", "for"),
yhi = 1, pwidth = 7, pheight = 7, punits = "in", res = 300,
ptsize = 12, cex.main = 1, verbose = TRUE)
```

Arguments

replist	list created by SS_output
add	add to existing plot (not yet implemented)
plot	plot to active plot device?
print	print to PNG files?
plotdir	directory where PNG files will be written. by default it will be the directory where the model was run.
fleets	optional vector to subset fleets for which plots will be made
fleetnames	optional replacement for fleenames used in data file
labels	vector of labels for plots (titles and axis labels)
yhi	maximum y-value to include in plot (all data included regardless). Default = 1.
pwidth	width of plot written to PNG file
pheight	height of plot written to PNG file
punits	units for PNG file
res	resolution for PNG file
ptsize	ptsize for PNG file
cex.main	character expansion for plot titles
verbose	report progress to R GUI?

Author(s)

Ian Taylor, Ian Stewart

SSplotIndices *Plot indices of abundance and associated quantities.*

Description

Plot indices of abundance and associated quantities.

Usage

```
SSplotIndices(replist,subplots=1:9,
  plot=TRUE,print=FALSE,
  fleets="all",fleetnames="default",
  smooth=TRUE,add=FALSE,datplot=FALSE,
  labels=c("Year",
    "Index",
    "Observed index",
    "Expected index",
    "Log index",
    "Log observed index",
    "Log expected index",
    "Standardized index",
    "Catchability (Q)",
    "Time-varying catchability",
    "Vulnerable biomass",
    "Catchability vs. vulnerable biomass"),
  col1="default", col2="default", col3="blue", col4="red",
  pch1=1, pch2=16, cex=1,
  legend=TRUE, legendloc="topright", seasnames=NULL,
  pwidth=7,pheight=7,punits="in",res=300,ptsize=12,cex.main=1,
  addmain=TRUE, plotdir="default", verbose=TRUE)
```

Arguments

replist	list created by SS_output
subplots	vector controlling which subplots to create
plot	plot to active plot device?
print	print to PNG files?
fleets	optional vector to subset fleets for which plots will be made
fleetnames	optional replacement for fleenames used in data file
smooth	add smoothed line to plots of observed vs. expected sample sizes
add	add to existing plot (not yet implemented)
datplot	make plot of data only?
labels	vector of labels for plots (titles and axis labels)

col1	vector of colors for points in each season for time series plot. Default is red for single season models and a rainbow using the rich.colors.short function for multiple seasons.
col2	vector of colors for points in each season for obs. vs. exp. plot. Default is blue for single season models and a rainbow using the rich.colors.short function for multiple seasons.
col3	color of line showing expected index in time series plot. Default is blue.
col4	color of smoother shown in obs. vs. exp. plots. Default is red.
pch1	single value or vector of plotting characters (pch parameter) for time-series plots of index fit. Default=1.
pch2	single value or vector of plotting characters (pch parameter) for sample size plots of index fit. Default=16.
cex	character expansion factor for points showing observed values. Default=1.
legend	add a legend to seasonal colors (only for seasonal models)
legendloc	add a legend to seasonal colors (default is "topright")
seasnames	optional vector of names for each season to replace defaults if a legend is used
pwidth	width of plot written to PNG file
pheight	height of plot written to PNG file
punits	units for PNG file
res	resolution for PNG file
ptsize	ptsize for PNG file
cex.main	character expansion for plot titles
addmain	switch which allows the plot title to be left off
plotdir	directory where PNG files will be written. by default it will be the directory where the model was run.
verbose	report progress to R GUI?

Author(s)

Ian Stewart, Ian Taylor

SSplotMCMC_ExtraSelex *Plot uncertainty around chosen selectivity ogive from MCMC.*

Description

Plot uncertainty in selectivity from an MCMC output for whichever fleet/year was chosen in the optional extra "more stddev reporting"

Usage

```
SSplotMCMC_ExtraSelex(post, add = FALSE, nsexes = 1, shift = 0,
fleetname = "default", col = "blue")
```

Arguments

post	A data frame containing either derived_posteriors.sso or a good subset of it. This can be an element of the list created by the the SSgetMCMC function.
add	TRUE/FALSE option to add results to an existing plot.
nsexes	Number of sexes in the model (should match model values but is only used in the title).
shift	Optional adjustment to the x values to avoid overlap of intervals when overplotting on an existing plot.
fleetname	Optional input to make the title better. Default will be something like "Fleet 1", using the numbering from the model.
col	Color for points and lines.

Author(s)

Ian Taylor

SSplotMnwt *Plot mean weight data and fits.*

Description

Plot mean weight data and fits from Stock Synthesis output. Intervals are based on T-distributions as specified in model.

Usage

```
SSplotMnwt(replist, add = FALSE, plot = TRUE, print = FALSE,
fleets = "all", fleetnames = "default", labels =
c("Year", "discard", "retained catch", "whole catch",
"Mean individual body weight (kg)", "Mean weight in", "for fleet"),
col1="blue", col2="red",
pwidth = 7, pheight = 7, punits = "in", res = 300, ptsize = 12,
cex.main=1, plotdir = "default", verbose = TRUE)
```

Arguments

replist	list created by SS_output
add	add to exising plot (not yet implemented)
plot	plot to active plot device?
print	print to PNG files?
plotdir	directory where PNG files will be written. by default it will be the directory where the model was run.
fleets	optional vector to subset fleets for which plots will be made

fleetnames	optional replacement for fleenames used in data file
labels	vector of labels for plots (titles and axis labels)
col1	first color to use in plot
col2	second color to use in plot
pwidth	width of plot written to PNG file
pheight	height of plot written to PNG file
punits	units for PNG file
res	resolution for PNG file
ptsize	ptsize for PNG file
cex.main	character expansion for plot titles
verbose	report progress to R GUI?

Author(s)

Ian Taylor, Ian Stewart

SSplotMovementMap *Show movement rates on a map.*

Description

Make a map with colored spatial cells and add arrows representing movement rates between cells.

Usage

```
SSplotMovementMap(replist=NULL, xlim, ylim,
           polygonlist, colvec, land="grey", xytable=NULL,
           moveage=5,moveseas=1,lwdscale=5,legend=TRUE,title=NULL)
```

Arguments

replist	optional list created by SS_output
xlim	range of longitude values in the map
ylim	range of latitude values in the map
polygonlist	a list of data frames, each with two columns representing the longitude and latitude values of the colored polygons. The order of elements in the list should match the numbering of areas in the SS model.
colvec	vector of colors for each polygon (if replist is provided)
land	color of landmasses in the map
xytable	data frame of latitude and longitude values which will be connected by the arrows representing movement rates. The order should match the order of areas in polygonlist and in the SS model. Not necessary if no arrows are shown on the map.

moveage	age for which movemement rates will be represented
moveseas	season for which movement rates will be represented
lwdscale	scaling factor for arrows in the plot. The largest rate of movement shown will be scaled to have a line width equal to this value.
legend	add a legend to show the movement rate associated with the widest arrows
title	optional title to be added above map

Note

Inspired by plots of MULTIFAN-CL movement patterns presented by Adam Langley

Author(s)

Ian Taylor

SSplotMovementRates *Show movement rates on a map.*

Description

Make a map with colored spatial cells and add arrows representing movement rates between cells.

Usage

```
SSplotMovementRates(replist, subplots=1:2, colvec="default",
  ylim="default", legend=TRUE, legendloc="topleft", moveseas="all",
  cex.main=1, verbose=TRUE)
```

Arguments

replist	list created by SS_output
subplots	which subplots to create
colvec	vector of colors for each movement rate in the plot
ylim	optional input for y range of the plot. By default plot ranges from 0 to 10% above highest movement rate (not including fish staying in an area).
legend	add a legend designating which color goes with which pair of areas?
legendloc	location passed to legend function (if used)
moveseas	choice of season for which movemement rates are shown
cex.main	Character expansion parameter for plot titles
verbose	Print information on function progress.

Author(s)

Ian Taylor

Examples

```
  ## Not run:
    SSplotMovementRates(myreplist)

## End(Not run)
```

SSplotNumbers *Plot numbers-at-age related data and fits.*

Description

Plot numbers-at-age related data and fits from Stock Synthesis output. Plots include bubble plots, mean age, equilibrium age composition, sex-ratio, and ageing imprecision patterns.

Usage

```
SSplotNumbers(replist, subplots = 1:9, plot = TRUE, print = FALSE,
areas = "all", areanames = "default", areacols = "default",
pntscalar = 2.6, period = c("B","M"), add = FALSE,
labels=c("Year",
  "Age",
  "True age (yr)",
  "SD of observed age (yr)",
  "Mean observed age (yr)",
  "Mean age (yr)",
  "mean age in the population",
  "Ageing imprecision",
  "Numbers at age at equilibrium",
  "Equilibrium age distribution",
  "Sex ratio of numbers at age (males/females)",
  "Length",
  "Mean length (cm)",
  "mean length (cm) in the population",
  "expected numbers at age",
  "Beginning of year",
  "Middle of year",
  "expected numbers at length",
  "Sex ratio of numbers at length (males/females)",
  "Sex ratio of numbers at length (females/males)"),
pwidth = 7, pheight = 7, punits = "in", res = 300,
ptsize = 12, cex.main = 1, plotdir = "default", verbose = TRUE)
```

Arguments

replist	list created by SSoutput
subplots	vector controlling which subplots to create

plot	plot to active plot device?
print	print to PNG files?
areas	optional subset of areas to plot for spatial models
areanames	names for areas. Default is to use Area1, Area2,...
areacols	vector of colors by area
pntscalar	maximum bubble size for bubble plots; each plot scaled independently based on this maximum size and the values plotted. Often some plots look better with one value and others with a larger or smaller value. Default=2.6
period	indicator of whether to make plots using numbers at age just from the beginning ("B") or middle of the year ("M") (new option starting with SSv3.11)
add	add to existing plot? (not yet implemented)
labels	vector of labels for plots (titles and axis labels)
pwidth	width of plot written to PNG file
pheight	height of plot written to PNG file
punits	units for PNG file
res	resolution for PNG file
ptsize	ptsize for PNG file
cex.main	character expansion for plot titles
plotdir	directory where PNG files will be written. by default it will be the directory where the model was run.
verbose	report progress to R GUI?

Author(s)

Ian Stewart, Ian Taylor

`SSplotPars` *Plot distributions of priors, posteriors, and estimates.*

Description

Make multi-figure plots of prior, posterior, and estimated asymptotic parameter distributions. MCMC not required to make function work.

Usage

```
SSplotPars(dir = "c:/path/", repfile = "Report.sso",
postfile = "posteriors.sso", showpost = T, showprior = T,
showmle = T, showinit = T, showrecdev = T, priorinit = T,
priorfinal = T, showlegend = T, fitrange = F, xaxs="i",
xlim=NULL, ylim=NULL, verbose = T, nrows = 3, ncols = 3,
new = T, pdf = F, pwidth = 7, pheight = 7, punits="in",
ptsize = 12, returntable = F, strings = c(), exact = F,
newheaders=NULL, burn = 0, thin = 1,
ctlfile = "control.ss_new")
```

Arguments

dir	Directory where all files are located.
repfile	Name of report file. Default="Report.sso".
postfile	Name of MCMC posteriors file (not required). Default="posteriors.sso".
showpost	Show posterior distribution as bar graph? Default=T.
showprior	Show prior distribution as black line? Default=T.
showmle	Show MLE estimate and asymptotic variance estimate with blue lines? Default=T.
showinit	Show initial value as red triangle? Default=T.
showrecdev	Include recdevs in the plot? Default=T.
priorinit	T/F for prior probability at initial value (not implemented).
priorfinal	T/F for prior probability at final value (not implemented).
showlegend	Show the legend? Default=T.
fitrange	Fit range tightly around MLE & posterior distributions, instead of full parameter range? Default=F.
xaxs	Parameter input for x-axis. See ?par for more info. Default="i".
xlim	Optional x-axis limits to be applied to all plots. Otherwise, limits are based on the model results. Default=NULL.
ylim	Optional y-axis limits to be applied to all plots. Otherwise, limits are based on the model results. Default=NULL.
verbose	Controls amount of text output (maybe). Default=T.
nrows	How many rows in multi-figure plot. Default=3.
ncols	How many columns in multi-figure plot. Default=3.
new	Open new window for plotting? Default=T.
pdf	Write to PDF file instead of R GUI? Default=F.
pwidth	Default width of plots printed to files in units of punits. Default=7.
pheight	Default height width of plots printed to files in units of punits. Default=7.
punits	Units for pwidth and pheight. Can be "px" (pixels), "in" (inches), "cm" or "mm". Default="in".
ptsize	Point size for plotted text in plots printed to files (see help("png") in R for details). Default=12.
returntable	Return table of parameter info? Default=F.
strings	Subset parameters included in the plot using substring from parameter names (i.e. "SR" will get "SR_R0" and "SR_steep" if they are both estimated quantities in this model). Default=c().
exact	Should strings input match parameter names exactly? Otherwise substrings are allowed. Default=F.
newheaders	Optional vector of headers for each panel to replace the parameter names. Default=NULL.
burn	Additional burn-in applied to MCMC posteriors. Default=0.
thin	Additional thinning applied to MCMC posteriors. Default=1.
ctlfile	Specify control file to get min and max recdev values (otherwise assumed to be -5 and 5). Default="control.ss_new".

Author(s)

Ian Taylor

Examples

```
## Not run:
pars <- SSplotPars(dir='c:/SS/Simple/')

# strings can be partial match
pars <- SSplotPars(dir='c:/SS/Simple/',strings=c("steep"))

## End(Not run)
```

SSplotRecdevs *Plot recruitment deviations*

Description

Plot recruitment deviations and associated quantities including derived measures related to bias adjustment.

Usage

```
SSplotRecdevs(replist, subplots = 1:4,
plot = TRUE, print = FALSE, add = FALSE,
uncertainty = TRUE, forecastplot = FALSE,
col1 = "black", col2 = "blue",
col3 = "green3", col4 = "red", legendloc = "topleft",
labels = c("Year", "Asymptotic standard error estimate",
"Log recruitment deviation", "Bias adjustment check",
"Bias adjustment fraction, 1 - stddev^2 / sigmaR^2"),
pwidth = 7, pheight = 7, punits = "in", res = 300, ptsize = 12,
cex.main = 1, plotdir = "default", verbose = TRUE)
```

Arguments

replist	list created by SSoutput
subplots	vector controlling which subplots to create
plot	plot to active plot device?
print	print to PNG files?
add	add to existing plot (not yet implemented)
uncertainty	include plots showing uncertainty?
forecastplot	include points from forecast years?
col1	first color used
col2	second color used

col3	third color used
col4	fourth color used
legendloc	location of legend. see ?legend for more info
labels	vector of labels for plots (titles and axis labels)
pwidth	width of plot written to PNG file
pheight	height of plot written to PNG file
punits	units for PNG file
res	resolution for PNG file
ptsize	ptsize for PNG file
cex.main	character expansion for plot titles
plotdir	directory where PNG files will be written. by default it will be the directory where the model was run.
verbose	report progress to R GUI?

Author(s)

Ian Taylor, Ian Stewart

SSplotRecdist *Plot of recruitment distribution among areas and seasons*

Description

Image plot shows fraction of recruitment in each combination of area and season. This is based on the RECRUITMENT_DIST section of the Report.sso file.

Usage

```
SSplotRecdist(replist, plot=TRUE, print=FALSE, areanames=NULL,
seasnames=NULL, xlab="", ylab="",
main="Distribution of recruitment by area and season",
plotdir="default", pwidth=7, pheight=7, punits="in",
res=300, ptsize=12, cex.main=1, verbose=TRUE)
```

Arguments

replist	list created by SS_output
plot	plot to active plot device?
print	print to PNG files?
areanames	optional vector to replace c("Area1","Area2",...)
seasnames	optional vector to replace c("Season1","Season2",...)
xlab	optional x-axis label (if the area names aren't informative enough)

ylab	optional y-axis label (if the season names aren't informative enough)
main	title for plot
plotdir	directory where PNG files will be written. by default it will be the directory where the model was run.
pwidth	width of plot written to PNG file
pheight	height of plot written to PNG file
punits	units for PNG file
res	resolution for PNG file
ptsize	ptsize for PNG file
cex.main	character expansion for plot titles
verbose	report progress to R GUI?

Author(s)

Ian Taylor

SSplotSelex *Plot selectivity*

Description

Plot selectivity, including retention and other quantities, with additional plots for time-varying selectivity.

Usage

```
SSplotSelex(replist, fleets = "all", fleetnames = "default",
sexes="all", selexlines = 1:5, subplot = 1:11,
plot = TRUE, print = FALSE, add = FALSE,
labels=c("Length (cm)",
  "Age (yr)",
  "Year",
  "Selectivity",
  "Retention",
  "Discard mortality"),
col1 = "red", col2 = "blue",
pwidth = 7, pheight = 7, punits = "in", res = 300, ptsize = 12,
cex.main = 1, plotdir = "default", verbose = TRUE)
```

Arguments

replist	list created by SS_output
fleets	optional vector to subset fleets for which to make plots
fleetnames	optional replacement for fleenames used in data file
sexes	optional vector to subset genders for which to make plots (1=females, 2=males)
selexlines	vector to select which lines get plotted. values are 1. Selectivity, 2. Retention, 3. Discard mortality, 4. Keep = Sel*Ret, 5. Dead = Sel*(Ret+(1-Ret)*Mort).
subplot	vector controlling which subplots to create
plot	plot to active plot device?
print	print to PNG files?
add	add to existing plot (not yet implemented)
labels	vector of labels for plots (titles and axis labels)
col1	color for female growth curve
col2	color for male growth curve
pwidth	width of plot written to PNG file
pheight	height of plot written to PNG file
punits	units for PNG file
res	resolution for PNG file
ptsize	ptsize for PNG file
cex.main	character expansion for plot titles
plotdir	directory where PNG files will be written. by default it will be the directory where the model was run.
verbose	report progress to R GUI?

Author(s)

Ian Stewart, Ian Taylor

See Also

SS_plots, SS_output

SSplotSpawnrecruit *Plot spawner-recruit curve.*

Description

Plot spawner-recruit curve based on output from Stock Synthesis model.

Usage

```
SSplotSpawnrecruit(replist, subplot=1:2, add = FALSE, plot = TRUE,
print = FALSE, xlim = NULL, ylim = NULL, xlab = "Spawning biomass (mt)",
ylab = "Recruitment (1,000s)", plotdir = "default",
pwidth = 7, pheight = 7, punits = "in", res = 300, ptsize = 12,
cex.main = 1,  verbose = TRUE, line1 = "blue", line2 = "green3",
line3 = "black", minyr = "default", textmindev = 0.5, ptcol = "red",
virg = TRUE, init = FALSE, forecast = FALSE)
```

Arguments

replist	list created by SS_output
subplot	vector of which subplots to show. 1=plot without labels, 2=plot with year labels.
add	add to existing plot?
plot	plot to active plot device?
print	print to PNG files?
xlim	optional control of x range
ylim	optional control of y range
xlab	x-axis label
ylab	y-axis label
plotdir	directory where PNG files will be written. by default it will be the directory where the model was run.
pwidth	width of plot written to PNG file
pheight	height of plot written to PNG file
punits	units for PNG file
res	resolution for PNG file
ptsize	ptsize for PNG file
cex.main	character expansion for plot titles
verbose	report progress to R GUI?
line1	first line color
line2	second line color
line3	third line color
minyr	minimum year of recruitment deviation to show in plot

textmindev	minimum recruitment deviation for label to be added so only extreme devs are labeled (labels are added to first and last years as well). Default=0.7.
ptcol	point color
virg	add point for equilibrium conditions (x=B0,y=R0)
init	add point for initial conditions (x=B1,y=R1)
forecast	include forecast years in the curve?

Author(s)

Ian Stewart, Ian Taylor

See Also

SS_plots, SS_output

SSplotSPR *Plot SPR quantities.*

Description

Plot SPR quantities, including 1-SPR and phase plot.

Usage

```
SSplotSPR(replist, add = FALSE, plot = TRUE, print = FALSE, uncertainty
= TRUE, subplots = 1:4, col1 = "black", col2 = "blue", col3 = "green3",
col4 = "red", sprtarg = "default", btarg = "default",
labels = c("Year", "SPR", "1-SPR"), pwidth = 7, pheight = 7,
punits = "in", res = 300, ptsize = 12, cex.main = 1,
plotdir = "default", verbose = TRUE)
```

Arguments

replist	list created by SSoutput
add	add to existing plot (not yet implemented)
plot	plot to active plot device?
print	print to PNG files?
uncertainty	include plots showing uncertainty?
subplots	vector controlling which subplots to create
col1	first color used
col2	second color used
col3	third color used
col4	fourth color used

sprtarg	F/SPR proxy target. "default" chooses based on model output.
btarg	target depletion to be used in plots showing depletion. May be omitted by setting to NA. "default" chooses based on model output.
labels	vector of labels for plots (titles and axis labels)
pwidth	width of plot written to PNG file
pheight	height of plot written to PNG file
punits	units for PNG file
res	resolution for PNG file
ptsize	ptsize for PNG file
cex.main	character expansion for plot titles
plotdir	directory where PNG files will be written. by default it will be the directory where the model was run.
verbose	report progress to R GUI?

Author(s)

Ian Stewart, Ian Taylor

See Also

SS_plots, SS_output

SSplotTags *Plot tagging data and fits*

Description

Plot observed and expected tag recaptures in aggregate and by tag group.

Usage

```
SSplotTags(replist = replist, subplots = 1:8, rows = 1, cols = 1,
tagrows = 3, tagcols = 3, plot = TRUE, print = FALSE, pntscalar = 2.6,
minnbubble = 8, pwidth = 7, pheight = 7, punits = "in", ptsize = 12, res
= 300, cex.main = 1, col1 = "blue", col2 = "red", col3 = "grey80",
labels = c("Year", "Frequency", "Tag Group",
           "Fit to tag recaptures by tag group",
           "Tag recaptures aggregated across tag groups",
           "Observed tag recaptures by year and tag group",
           "Residuals for tag recaptures: (obs-exp)/sqrt(exp)",
           "Observed and expected tag recaptures by year and tag group"),
plotdir = "default", verbose = TRUE)
```

Arguments

replist	list created by SS_output
subplots	vector controlling which subplots to create
rows	number or rows of panels for regular plots
cols	number or columns of panels for regular plots
tagrows	number or rows of panels for multi-panel plots
tagcols	number or columns of panels for multi-panel plots
plot	plot to active plot device?
print	print to PNG files?
pntscalar	maximum bubble size for balloon plots; each plot scaled independently based on this maximum size and the values plotted. Often some plots look better with one value and others with a larger or smaller value. Default=2.6
minnbubble	minimum number of years below which blank years will be added to bubble plots to avoid cropping
pwidth	default width of plots printed to files in units of punits. Default=7.
pheight	default height width of plots printed to files in units of punits. Default=7.
punits	units for pwidth and pheight. Can be "px" (pixels), "in" (inches), "cm" or "mm". Default="in".
ptsize	point size for plotted text in plots printed to files (see help("png") in R for details). Default=12.
res	resolution of plots printed to files. Default=300
cex.main	character expansion parameter for plot titles
col1	first color used
col2	second color used
col3	third color used
labels	vector of labels for plots (titles and axis labels)
plotdir	directory where PNG files will be written. by default it will be the directory where the model was run.
verbose	return updates of function progress to the R GUI?

Author(s)

Andre Punt, Ian Taylor

See Also

SS_plots, SS_output

SSplotTimeseries *Plot timeseries data*

Description

Plot timeseries data contained in TIME_SERIES output from Stock Synthesis report file. Some values have optional uncertainty intervals.

Usage

```
SSplotTimeseries(replist, subplot, add = FALSE, areas = "all",
areacols = "default", areanames = "default", forecastplot = TRUE,
uncertainty = TRUE, bioscale = "default", minyr=NULL, maxyr=NULL,
plot = TRUE, print = FALSE, plotdir = "default", verbose = TRUE,
btarg="default", minbthresh="default", xlab = "Year",
           labels=c("Total biomass (mt)",
             "Total biomass (mt) at beginning of season",
             "Summary biomass (mt)",
             "Summary biomass (mt) at beginning of season",
             "Spawning biomass (mt)",
             "Spawning depletion",
             "Spawning output (eggs)",
             "Age-0 recruits (1,000s)",
             "Fraction of total Age-0 recruits"),
pwidth = 7, pheight = 7, punits = "in", res = 300, ptsize = 12,
cex.main = 1)
```

Arguments

replist	list created by SS_output
subplot	number controlling which subplot to create
add	add to existing plot? (not yet implemented)
areas	optional subset of areas to plot for spatial models
areacols	vector of colors by area. Default uses rich.colors by Arni Magnusson
areanames	names for areas. Default is to use Area1, Area2,...
forecastplot	add points from forecast years
uncertainty	add intervals around quantities for which uncertainty is available
bioscale	scaling for spawning biomass by default it will be set to 0.5 for single-sex models, and 1.0 for all others
minyr	optional input for minimum year to show in plots
maxyr	optional input for maximum year to show in plots
plot	plot to active plot device?
print	print to PNG files?

plotdir	directory where PNG or PDF files will be written. by default it will be the directory where the model was run.
verbose	report progress to R GUI?
btarg	Target depletion to be used in plots showing depletion. May be omitted by setting to 0. "default" chooses value based on modeloutput.
minbthresh	Threshold depletion to be used in plots showing depletion. May be omitted by setting to 0. "default" assumes 0.25 unless btarg in model output is 0.25 in which case minbthresh = 0.125 (U.S. west coast flatfish).
xlab	x axis label for all plots
labels	vector of labels for plots (titles and axis labels)
pwidth	width of plot written to PNG file
pheight	height of plot written to PNG file
punits	units for PNG file
res	resolution for PNG file
ptsize	ptsize for PNG file
cex.main	character expansion for plot titles

Author(s)

Ian Taylor, Ian Stewart

See Also

SS_plots, SS_output

`SSplotYield` *Plot yield and surplus production.*

Description

Plot yield and surplus production from Stock Synthesis output. Surplus production is based on Walters et al. (2008).

Usage

```
SSplotYield(replist, subplots = 1:2, add = FALSE, plot = TRUE, print =
FALSE, labels = c("Relative depletion", "Equilibrium yield (mt)",
"Total biomass (mt)", "Surplus production (mt)"),
col = "blue", lty = 1, lwd = 2, cex.main = 1,
pwidth = 7, pheight = 7, punits = "in", res = 300, ptsize = 12,
plotdir = "default", verbose = TRUE)
```

Arguments

replist	list created by SS_output
subplots	vector controlling which subplots to create
add	add to existing plot? (not yet implemented)
plot	plot to active plot device?
print	print to PNG files?
labels	vector of labels for plots (titles and axis labels)
col	line color (only applied to equilbrium yield plot at this time)
lty	line type (only applied to equilbrium yield plot at this time)
lwd	line width (only applied to equilbrium yield plot at this time)
cex.main	character expansion for plot titles
pwidth	width of plot written to PNG file
pheight	height of plot written to PNG file
punits	units for PNG file
res	resolution for PNG file
ptsize	ptsize for PNG file
plotdir	directory where PNG files will be written. by default it will be the directory where the model was run.
verbose	report progress to R GUI?

Author(s)

Ian Stewart, Ian Taylor

References

Walters, Hilborn, and Christensen, 2008, Surplus production dynamics in declining and recovering fish populations. Can. J. Fish. Aquat. Sci. 65: 2536-2551

See Also

SS_plots, SS_output

SSrunsims *Run a collection of simulations for Stock Synthesis.*

Description

Runs simulations by looping over choices of Stock Synthesis data and control files, generating bootstrap data, and then running an estimation model using this data.

Usage

```
SSrunsims(sims = 1, newrun = TRUE, sim = FALSE, fit = FALSE,
simfolder = "sims", fitfolder = "fits", masterfolder = "fits",
MLEdata = FALSE, skipfiles = TRUE, simchoices = 1, fitchoices = 1,
samedatafile = FALSE, CAAL = TRUE, homepath = "c:/myfiles/",
recdevmatrix = NULL, rescale = TRUE, fitbiasramp = FALSE,
exe = "ss3_opt", simextras = "-nox -nohess",
fitextras = "-nox -gbs 1000000000 -cbs 1000000000",
fyr = NULL, lyr = NULL, printfile=TRUE, intern = FALSE,
 verbose = TRUE)
```

Arguments

sims	Vector of simulations to run for each case.
newrun	Define some settings? Pretty much always required. Default=TRUE.
sim	Do simulations? Default = FALSE.
fit	Do estimations? Default = FALSE.
simfolder	Name of folder where simulations are run. Default = "sims".
fitfolder	Name of folder where estimations are run. Default = "fits".
masterfolder	Name of folder to collect estimation results (if run in parallel). Default = "fits".
MLEdata	Use MLE values in estimation rather than bootstrap values. For model testing. Default = FALSE.
skipfiles	Skip any simulations that have already been run? Default = TRUE.
simchoices	Vector of indices of scenarios (combination of control and/or data file) to be simulated. Values are numeric, but correspond to letters in file names (1=ctl_simA.ss, 2=ctl_simB.ss). Default=1.
fitchoices	Vector of indices of scenarios (combination of control and/or data file) to be estimated. Values are numeric, but correspond to letters in file names (1=ctl_fitA.ss, 2=ctl_fitB.ss). Default=1.
samedatafile	Use the same data file for all simulations? (Alternative is one data file for each control file). Default=FALSE.
homepath	Location where the input files are located, and in which the above inputs for simfolder and fitfolder are located.

CAAL	Do additional bootstrapping of any conditional age-at-length (CAAL) data. This involves bootstrapping the sample sizes across length bins from a multinomial distribution with proportions determined by existing sample sizes, then using the resuling sample sizes to bootstrap composition data using MLE proportions within each length bin.
recdevmatrix	Matrix of recruit deviations. NULL = read from file or create new file if one doesn't exists. Default=NULL.
rescale	Argument passed to SS_recdevs: should the recdevs be rescaled to have mean = 0 and std. deviation = sigmaR? Default=TRUE.
fitbiasramp	Use the function SS_fitbiasramp to estimate bias adjustment inputs in control file during estimation mode? This requires running each model twice: once with no change to control file, and again with bias adjustment updated based on previous model run. Default=FALSE.
exe	Command to run executable. Default="ss3_opt".
simextras	Additional inputs to run model when in simulation mode. Default="-nox -nohess".
fitextras	Additional inputs to run model when in estimation mode. Default="-nox -gbs 1000000000 -cbs 1000000000".
fyr	First year of stochastic recruitment deviations to include in simulation models. NULL will run SS_readctl to get setting from control file. Default=NULL.
lyr	Last year of stochastic recruitment deviations to include in simulation models. NULL will run SS_readctl to get setting from control file. Default=NULL.
printfile	Switch to determine whether description of completed runs is printed to a file or not. Default=TRUE.
intern	Input passed to system command. If FALSE then output from ADMB is printed to screen during model run otherwise it is written to a file.
verbose	Print various messages to the command line as the function runs? Default=TRUE.

See Also

SSgetoutput SSsummarize

SSsummarize *Summarize the output from multiple Stock Synthesis models.*

Description

Summarize various quantities from the model output collected by SSgetoutput and return them in a list of tables and vectors.

Usage

```
SSsummarize(biglist, keyvec = NULL, numvec = NULL,
selfactor = "Lsel", selfleet = NULL, selyr = "min", selgender = 1,
lowerCI = 0.025, upperCI = 0.975)
```

Arguments

biglist	A list of lists created by SSgetoutput.
keyvec	Optional list of strings matching names of elements of biglist to subset. Default=NULL.
numvec	Optional list of numbers of elements from biglist to subset. Default=NULL.
selfactor	A string or vector of strings indicating which elements of the selectivity at length output to summarize. Default=c("Lsel").
selfleet	Vector of fleets for which selectivity will be summarized. NULL=all fleets. Default=NULL.
selyr	String or vector of years for which selectivity will be summarized. NOTE: NOT CURRENTLY WORKING. Options: NULL=all years, "min" = first year, "max" = last year. Default="min".
selgender	Vector of genders (1 and/or 2) for which selectivity will be summarized. NULL=all genders. Default=NULL.
lowerCI	Quantile for lower bound on calculated intervals. Default = 0.025 for 95% intervals.
upperCI	Quantile for upper bound on calculated intervals. Default = 0.975 for 95% intervals.

Author(s)

Ian Taylor

See Also

SSgetoutput SSrunsims

SStableComparisons *make table comparing quantities across models*

Description

Creates a table comparing key quantities from multiple models, which is a reduction of the full information in various parts of the list created using the SSsummarize function.

Usage

```
SStableComparisons(summaryoutput,
           models="all",
           likenames=c("TOTAL",
             "Survey",
             "Length_comp",
             "Age_comp",
             "priors",
```

```
  "Size_at_age"),
names=c("R0",
  "steep",
  "NatM",
  "Q",
  "L_at_Amax",
  "VonBert_K",
  "RecrDev_2008",
  "SPB_Virg",
  "Bratio_2011",
  "SPRratio_2010"),
modelnames="default",
csv=FALSE,
csvdir="workingdirectory",
csvfile="parameter_comparison_table.csv",
verbose=TRUE)
```

Arguments

summaryoutput	list created by SSsummarize
models	optional subset of the models described in summaryoutput. Either "all" or a vector of numbers indicating columns in summary tables.
likenames	Labels for likelihood values to include, should match substring of labels in summaryoutput$likelihoods.
names	Labels for parameters or derived quantities to include, should match substring of labels in summaryoutput$pars or summaryoutput$quants.
modelnames	optional vector of labels to use as column names. Default is 'model1','model2',etc.
csv	write resulting table to CSV file?
csvdir	directory for optional CSV file
csvfile	filename for CSV file
verbose	report progress to R GUI?

Author(s)

Ian Taylor

See Also

SSsummarize, SSplotComparisons, SS_output

SS_changepars *Change parameters in the control file.*

Description

A function to take advantage of SS_parlines that could be used to create a series of control files with different parameter values. This is used by SS_profile, but may also be useful for simulation work.

Usage

```
SS_changepars(dir = "C:/myfiles/mymodels/myrun/",
ctlfile = "control.ss_new", newctlfile = "control_modified.ss",
linenums = NULL, strings = NULL, newvals = NULL, estimate = FALSE,
verbose = TRUE)
```

Arguments

dir	Directory with control file to change.
ctlfile	Control file name. Default="control.ss_new".
newctlfile	Name of new control file to be written. Default="control_modified.ss".
linenums	Line numbers of control file to be modified. Either this or the Strings input are needed. Default=NULL.
strings	Strings (with optional partial matching) indicating which parameters to be modified. This is an alternative to linenums. Strings correspond to the commented parameter names included in control.ss_new, or whatever is written as comment at the end of the 14 number parameter lines. Default=NULL.
newvals	Vector of new parameter values. Default=NULL.
estimate	Vector of TRUE/FALSE for which changed parameters are to be estimated. Default=FALSE.
verbose	More detailed output to command line. Default=TRUE.

Author(s)

Ian Taylor

See Also

SS_parlines, SS_profile

Examples

```
## Not run:
SS_changepars(dir='Y:/ss/SSv3.03a/Simple/',ctlfile='Control.SS_New',
              strings=c('SR_steep','SR_sigmaR'),newvals=c(.35,.6))
# [1] wrote new file to Control_Modified.SS
#    oldvals newvals oldphase newphase     comment
# 1 0.609048    0.35        4       -4  # SR_steep
# 2 0.600000    0.60       -4       -4 # SR_sigmaR

## End(Not run)
```

`SS_fitbiasramp` *Estimate bias adjustment for recruitment deviates*

Description

Uses standard error of estimated recruitment deviates to estimate the 5 controls for the bias adjustment in Stock Synthesis

Usage

```
SS_fitbiasramp(replist, verbose=FALSE, startvalues=NULL, method="BFGS",
  twoplots=TRUE, transform=FALSE, png=FALSE, pdf=FALSE, oldctl=NULL,
  newctl=NULL, pwidth=7, pheight=7, punits="in", ptsize=12, res=300,
  cex.main=1)
```

Arguments

`replist`	Object created using `SS_output`
`verbose`	Controls the amount of output to the screen. Default=FALSE.
`startvalues`	A vector of 5 values for the starting points in the minimization. Default=NULL.
`method`	A method to apply to the 'optim' function. See ?optim for options. Default="BFGS".
`twoplots`	Make a two-panel plot showing devs as well as transformed uncertainty, or just the second panel in the set? Default=TRUE.
`transform`	An experimental option to treat the transform the 5 quantities to improve minimization. Doesn't work well. Default=FALSE.
`png`	Send plot to PNG file? Default=FALSE.
`pdf`	Send plot to PDF file? Default=FALSE.
`oldctl`	Optional name of existing control file to modify. Default=NULL.
`newctl`	Optional name of new control file to create from old file with estimated bias adjustment values. Default=NULL.
`pwidth`	Default width of plots printed to files in units of `punits`. Default=7.
`pheight`	Default height width of plots printed to files in units of `punits`. Default=7.

punits	Units for pwidth and pheight. Can be "px" (pixels), "in" (inches), "cm" or "mm". Default="in".
ptsize	Point size for plotted text in plots printed to files (see help("png") in R for details). Default=12.
res	Resolution of plots printed to files. Default=300.
cex.main	Character expansion for plot titles.

Author(s)

Ian Taylor

References

Methot, R.D. and Taylor, I.G., 2010. Modeling the variability of recruitment in fishery assessment models. In review.

See Also

SS_output

SS_makedatlist *make a list for SS data*

Description

create a list similar to those built by SS_readdat which can be written to a Stock Synthesis data file using SS_writedat. In hindsight, this function doesn't seem very useful and I haven't taken time to describe the arguments below.

Usage

```
SS_makedatlist(styr = 1971, endyr = 2001, nseas = 1, months_per_seas =
12, spawn_seas = 1, Nfleet = 1, Nsurveys = 1, N_areas = 1, fleetnames =
c("fishery1", "survey1"), surveytiming = 0.5, areas = 1, units_of_catch
= 1, se_log_catch = 0.01, Ngenders = 2, Nages = 40, init_equil = 0,
catch = NULL, CPUE = NULL, discard_units = 2, discard_data = NULL,
meanbodywt = NULL, lbin_method = 2, binwidth = 2, minimum_size = 2,
maximum_size = 90, comp_tail_compression = -1e-04, add_to_comp = 1e-04,
max_combined_lbin = 0, lbin_vector = seq(22, 90, 2), lencomp = NULL,
agebin_vector = 1:25, ageerror = data.frame(rbind(0:40 + 0.5, 0.001,
0:40 + 0.5, seq(0.525, 2.525, 0.05))), agecomp = NULL, Lbin_method = 3,
max_combined_age = 1, MeanSize_at_Age_obs = NULL, N_environ_variables =
0, N_environ_obs = 0, N_sizefreq_methods = 0, tag_data = 0,
morphcomp_data = 0)
```

Arguments

styr	start year of the model
endyr	end year of the model
nseas	number of seasons
months_per_seas	months per seasons
spawn_seas	spawning season
Nfleet	number of fishing fleets
Nsurveys	number of surveys
N_areas	number of areas
fleetnames	names of fleets
surveytiming	vector of survey timings
areas	area definitions for each fleet or survey
units_of_catch	units of catch for each fleet
se_log_catch	... description to be added ...
Ngenders	... description to be added ...
Nages	... description to be added ...
init_equil	... description to be added ...
catch	... description to be added ...
CPUE	... description to be added ...
discard_units	... description to be added ...
discard_data	... description to be added ...
meanbodywt	... description to be added ...
lbin_method	... description to be added ...
binwidth	... description to be added ...
minimum_size	... description to be added ...
maximum_size	... description to be added ...
comp_tail_compression	... description to be added ...
add_to_comp	... description to be added ...
max_combined_lbin	... description to be added ...
lbin_vector	... description to be added ...
lencomp	... description to be added ...
agebin_vector	... description to be added ...
ageerror	... description to be added ...
agecomp	... description to be added ...
Lbin_method	... description to be added ...

max_combined_age
... description to be added ...

MeanSize_at_Age_obs
... description to be added ...

N_environ_variables
... description to be added ...

N_environ_obs ... description to be added ...

N_sizefreq_methods
... description to be added ...

tag_data ... description to be added ...

morphcomp_data ... description to be added ...

Author(s)

Ian Taylor

See Also

SS_readdat, SS_writedat

SS_output *A function to create a list object for the output from Stock Synthesis*

Description

Reads the Report.sso and (optionally) the covar.sso, CompReport.sso and other files files produced by Stock Synthesis and formats the important content of these files into a list in the R workspace. A few statistics unavailable elsewhere are taken from the .par and .cor files. Summary information and statistics can be returned to the R console or just contained within the list produced by this function.

Usage

```
SS_output(dir = "C:/myfiles/mymodels/myrun/", model = "ss3",
repfile = "Report.sso", compfile = "CompReport.sso",
covarfile = "covar.sso", ncols = 200, forecast = TRUE, warn = TRUE,
covar = TRUE, checkcor = TRUE, cormax = 0.95, cormin = 0.01,
printhighcor = 10, printlowcor = 10, verbose = TRUE,
printstats = TRUE, hidewarn = FALSE, NoCompOK = FALSE,
aalmaxbinrange = 4)
```

Arguments

dir	Locates the directory of the files to be read in, double backslashes (or forward-slashes) and quotes necessary.
model	Name of the executable (leaving off the .exe). Deafult="ss3"
repfile	Name of the big report file (could be renamed by user). Default="Report.sso".
compfile	Name of the composition report file. Default="CompReport.sso".
covarfile	Name of the covariance output file. Default="covar.sso".
ncols	The maximum number of columns in files being read in. If this value is too big the function runs more slowly, too small and errors will occur. A warning will be output to the R command line if the value is too small. It should be bigger than the maximum age + 10 and the number of years + 10. Default=200.
forecast	Read the forecast-report file? Default=TRUE.
warn	Read the Warning.sso file? Default=TRUE.
covar	Read covar.sso to get variance information and identify bad correlations? Default=TRUE.
checkcor	Check for bad correlations? Default=TRUE.
cormax	The specified threshold for defining high correlations. A quantity with any correlation above this value is identified. Default=0.95.
cormin	The specified threshold for defining low correlations. Only quantities with all correlations below this value are identified (to find variables that appear too independent from the model results). Default=0.01.
printhighcor	The maximum number of high correlations to print to the R GUI. Default=10.
printlowcor	The maximum number of low correlations to print to the R GUI. Default=10.
verbose	Return updates of function progress to the R GUI? Default=TRUE.
printstats	Print summary statistics about the output to the R GUI? Default=TRUE.
hidewarn	Hides some warnings output from the R GUI. Default=FALSE.
NoCompOK	Allow the function to work without a CompReport file. Default=FALSE.
aalmaxbinrange	The largest length bin range allowed for composition data to be considered as conditional age-at-length data. Default=4.

Value

Many values are returned. Complete list would be quite long, but should probably be created at some point in the future.

Author(s)

Ian Stewart, Ian Taylor

See Also

SS_plots

Examples

```
  ## Not run:
    myreplist <- SS_output(dir='c:/SS/SSv3.10b/Simple/')

## End(Not run)
```

SS_parlines *Get parameter lines from Stock Synthesis control file*

Description

A simple function which takes as input the full path and filename of a control file for input to Stock Synthesis. Ideally, a Control.SS_New file will be used, so that it represents what SS thinks the inputs are, and not what the user thinks the inputs are.

It returns a table which should contain one line for each parameter in the model. Currently, only the first 7 values are returned, because all parameters have those values. In the future, extended parameter lines could be returned.

Parameter lines are identified as those which have 7 or 14 numeric elements followed by a non-numeric element. It's possible that this system could break down under certain circumstances

Usage

```
SS_parlines(ctlfile = "C:/myfiles/mymodels/myrun/control.ss_new",
dir=NULL, verbose = T, active = F)
```

Arguments

ctlfile	File name of control file including path.
dir	Alternative input of path, where file is assumed to be "control.ss_new". Default=NULL.
verbose	T/F switch for amount of detail produced by function. Default=T.
active	Should only active parameters (those with positive phase) be output? Default=F.

Author(s)

Ian Taylor

See Also

SS_changepars

Examples

```
## Not run:
x <- SS_parlines(ctlfile='Y:/ss/SSv3.03a/Simple/Control.SS_New')
head(x)
#       LO    HI     INIT PRIOR PR_type   SD PHASE              Label Line_num
# 42  0.05  0.15  0.10000  0.10       0  0.8    -3  NatM_p_1_Fem_GP_1       42
# 43  0.05  0.15  0.10000  0.10       0  0.8    -3  NatM_p_2_Fem_GP_1       43
# 44  1.00 45.00 32.28100 36.00       0 10.0     2 L_at_Amin_Fem_GP_1       44
# 45 40.00 90.00 71.34260 70.00       0 10.0     4 L_at_Amax_Fem_GP_1       45
# 46  0.05  0.25  0.15199  0.15       0  0.8     4 VonBert_K_Fem_GP_1       46
# 47  0.05  0.25  0.10000  0.10       0  0.8    -3  CV_young_Fem_GP_1       47

## End(Not run)
```

SS_plots *plot many quantities related to output from Stock Synthesis*

Description

Creates a user-chosen set of plots, including biological quantities, time series, and fits to data. Plots are sent to R GUI, single PDF file, or multiple PNG files. This is now just a wrapper which calls on separate functions to make all the plots.

Usage

```
SS_plots(replist = NULL, plot = 1:27, print = 0,
pdf = FALSE, printfolder = "plots", dir = "default", fleets = "all",
areas = "all", fleetnames = "default", fleetcols = "default",
fleetlty = 1, fleetpch = 1, lwd = 1, areacols = "default",
areanames = "default", verbose = TRUE, uncertainty = TRUE,
forecastplot = FALSE, datplot = FALSE, Natageplot = TRUE,
samplesizeplots = TRUE, compresidplots = TRUE, sprtarg = "default",
btarg = "default", minbthresh = "default", pntscalar = 2.6, minnbubble = 8,
aalyear = -1, aalbin = -1, aalresids = FALSE,
maxneff = 5000, cohortlines = c(), smooth = TRUE,
showsampsize = TRUE, showeffN = TRUE, showlegend = TRUE, pwidth = 7,
pheight = 7, punits = "in", ptsize = 12, res = 300, cex.main = 1,
selexlines = 1:5, rows = 1, cols = 1, maxrows = 6, maxcols = 6,
maxrows2 = 2, maxcols2 = 4, tagrows = 3, tagcols = 3, fixdims = TRUE,
new = TRUE, SSplotDatMargin = 8, catchasnumbers = FALSE,
legendloc = "topleft", minyr = NULL, maxyr = NULL, scalebins=FALSE, ...)
```

Arguments

replist	list created by SS_output
plot	Plot sets to be created, see list of plots below. Use to specify only those plot sets of interest, e.g., c(1,2,5,10). Plots for data not available in the model run will automatically be skipped, whether called or not. Default=1:24.

print	Plot set to be printed to files? PNG files are created in the specified directory for one or more requested plots. Each plot has a unique name starting with the number of the set it comes from and attempting to be mildly descriptive. This argument is independent of "plot" in that plots can be created on screen, or printed to file or both. Manual rescaling cannot be done after printing, so this option may not be the best choice for each plot; saving files from the screen allows more control. Default=0.
pdf	Send plots to PDF file instead of R GUI? Input plot must be used and input print must be 0. Default=0.
printfolder	Name of subfolder to create within the working directory into which any PNG files specified by print will be saved. By default the working directory is used with no subfolder. Default="".
dir	The directory in which any PNG files requested by print are created. By default it will be the same directory that the report file was read from by the SS_output function. Default="default".
fleets	Either the string "all", or a vector of numerical values, like c(1,3), listing fleets or surveys for which plots should be made. By default, plots will be made for all fleets and surveys. Default="all".
areas	Either the string "all", or a vector of numerical values, like c(1,3), listing areas for which plots should be made in a multi-area model. By default, plots will be made for all areas (excepting cases where the function has not yet been updated for multi-area models). Default="all".
fleetnames	Either the string "default", or a vector of characters strings to use for each fleet name. Default="default".
fleetcols	Either the string "default", or a vector of colors to use for each fleet. Default="default".
fleetlty	Vector of line types used for each fleet in some plots. Default=1.
fleetpch	Vector of point types used for each fleet in some plots. Default=1.
lwd	Line width for some plots. Default=1.
areacols	Either the string "default", or a vector of colors to use for each area. Default="default".
areanames	Optional vector of names for each area used in titles. Default="default".
verbose	Return updates of function progress to the R GUI? Default=T.
uncertainty	Include values in plots showing estimates of uncertainty (requires positive definite hessian in model and covar=T in SS_output)? Default=T.
forecastplot	Include forecast years in the plots? Obviously requires forecast options to have been used in the model. Default=T.
datplot	Plot the data by itself? This is useful in document preparation. Setting datplot=F is equivalent to leaving off plots 15 and 16. Default=F.
Natageplot	Plot the expected numbers at age bubble plots and mean-age time series? Default=T.
samplesizeplots	Show sample size plots? Default=T.

compresidplots	Show residuals for composition plots?
sprtarg	Specify the F/SPR proxy target. Default=0.4.
btarg	Target depletion to be used in plots showing depletion. May be omitted by setting to NA. Default=0.4.
minbthresh	Threshold depletion to be used in plots showing depletion. May be omitted by setting to NA. Default=0.25.
pntscalar	This scalar defines the maximum bubble size for balloon plots; each plot scaled independently based on this maximum size and the values plotted. Often some plots look better with one value and others with a larger or smaller value. Default=2.6
minnbubble	This defines the minimum number of years below which blank years will be added to bubble plots to avoid cropping. Default=8.
aalyear	Years to plot multi-panel conditional age-at-length fits for all length bins; must be in a "c(YYYY,YYYY)" format. Useful for checking the fit of a dominant year class, critical time period, etc. Default=-1.
aalbin	The length bin for which multi-panel plots of the fit to conditional age-at-length data will be produced for all years. Useful to see if growth curves are ok, or to see the information on year classes move through the conditional data. Default=-1.
aalresids	Plot the full set of conditional age-at-length Pearson residuals? Default=F.
maxneff	The maximum value to include on plots of input and effective sample size. Occasionally a calculation of effective N blows up to very large numbers, rendering it impossible to observe the relationship for other data. Default=5000.
cohortlines	Optional vector of birth years for cohorts for which to add growth curves to numbers at length bubble plots. Default=c().
smooth	Add loess smoother to observed vs. expected index plots and input vs. effective sample size? Default=T.
showsampsize	Display sample sizes on composition plots? Default=T.
showeffN	Display effective sample sizes on composition plots? Default=T.
showlegend	Display legends in various plots? Default=T.
pwidth	Default width of plots printed to files in units of punits. Default=7.
pheight	Default height width of plots printed to files in units of punits. Default=7.
punits	Units for pwidth and pheight. Can be "px" (pixels), "in" (inches), "cm" or "mm". Default="in".
ptsize	Point size for plotted text in plots printed to files (see help("png") in R for details). Default=12. =
res	Resolution of plots printed to files. Default=300.
cex.main	Character expansion parameter for plot titles (not yet implemented for all plots). Default=1.
selexlines	Vector controling which lines should be shown on selectivity plots if the model includes retention. Default=1:5.
rows	Number of rows to use for single panel plots. Default=1.

cols	Number of columns to use for single panel plots. Default=1.
maxrows	Maximum number of rows to for multi-panel plots. Default=6.
maxcols	Maximum number of columns for multi-panel plots. Default=6.
maxrows2	Maximum number of rows for conditional age at length multi-panel plots. Default=2.
maxcols2	Maximum number of rows for conditional age at length multi-panel plots. Default=4.
tagrows	Number of rows for tagging-related plots. Default=3.
tagcols	Number of columns for tagging-related plots. Default=3.
fixdims	Control whether multi-panel plots all have dimensions equal to maxrows by maxcols, or resized within those limits to fit number of plots. Default=T.
new	Open a new window or add to existing plot windows. Default=T.
SSplotDatMargin	Size of right-hand margin in data plot (may be too small if fleet names are long)
catchasnumbers	Is catch input in numbers instead of biomass? Default=F.
legendloc	Location for all legends. Default="topleft".
minyr	First year to show in time-series plots (changes xlim parameters).
maxyr	Last year to show in time-series plots (changes xlim parameters).
scalebins	Rescale expected and observed proportions in composition plots by dividing by bin width for models where bins have different widths? Caution!: May not work correctly in all cases.
...	Additional arguments that will be passed to some subfunctions.

Author(s)

Ian Stewart, Ian Taylor

References

Walters, Hilborn, and Christensen, 2008, Surplus production dynamics in declining and recovering fish populations. Can. J. Fish. Aquat. Sci. 65: 2536-2551.

See Also

SS_output, SSplotBiology, SSplotCatch, SSplotComps, SSplotDiscard, SSplotIndices, SSplotMnwt, SSplotNumbers, SSplotRecdevs, SSplotSelex, SSplotSpawnrecruit, SSplotSPR, SSplotTags, SSplotTimeseries, SSplotYield

SS_profile *Run a likelihood profile in Stock Synthesis.*

Description

Iteratively changes the control file using SS_changepars.

Usage

```
SS_profile(dir = "C:/myfiles/mymodels/myrun/",
  masterctlfile = "control.ss_new", newctlfile = "control_modified.ss",
  linenum = NULL, string = NULL, profilevec = NULL,
  command = "SS3 -nox", model = "ss3", systemcmd = F,
  saveoutput = T, verbose = T)
```

Arguments

dir	Directory where input files and executable are located.
masterctlfile	Source control file. Default = "control.ss_new"
newctlfile	Destination for new control files (must match entry in starter file). Default = "control_modified.ss".
linenum	Optional line number of parameter to be changed. Default = NULL.
string	Optional string partially matching name of parameter to be changed. Default = NULL.
profilevec	Vector of values to profile over. Default = NULL.
command	Call to executable. Default = "SS3 -nox".
model	Name of executable. Default = "ss3".
systemcmd	Should R call SS using "system" function intead of "shell". This may be required when running R in Emacs. Default = F.
saveoutput	Copy output .SSO files to unique names. Default = T.
verbose	Controls amount of info output to command line. Default = T.

Author(s)

Ian Taylor

See Also

SS_changepars, SS_parlines

SS_readctl *read control file*

Description

read Stock Synthesis control file into list object in R

Usage

```
SS_readctl(file)
```

Arguments

file	Filename either with full path or relative to working directory.

Details

This function is not fully implemented. The logic to figure out all the details of a Stock Synthesis control file is very complex, so this function may be completed in a way that is not totally consistent with the other similar files.

See Also

SS_readstarter, SS_readforecast, SS_readdat, SS_writestarter, SS_writeforecast, SS_writedat, SS_writectl

SS_readdat *read data file*

Description

read Stock Synthesis data file into list object in R

Usage

```
SS_readdat(file, verbose = TRUE, echoall = FALSE, section = NULL)
```

Arguments

file	Filename either with full path or relative to working directory.
verbose	Should there be verbose output while running the file? Default=TRUE.
echoall	Debugging tool (not fully implemented) of echoing blocks of data as it is being read.
section	Which data set to read. Only applies for a data.ss_new file created by Stock Synthesis. Allows the choice of either expected values (section=2) or bootstrap data (section=3+). Leaving default of section=NULL will read input data, (equivalent to section=1).

Author(s)

Ian Taylor

See Also

SS_readstarter, SS_readforecast, SS_readctl, SS_writestarter, SS_writeforecast, SS_writedat, SS_writectl

---

SS_readforecast *read forecast file*

Description

read Stock Synthesis forecast file into list object in R

Usage

```
SS_readforecast(file = "forecast.ss", Nfleets = NULL, verbose = TRUE)
```

Arguments

file	Filename either with full path or relative to working directory.
Nfleets	Number of fleets. Only required if fleet allocation option is used. Default=NULL.
verbose	Should there be verbose output while running the file?

Author(s)

Ian Taylor

See Also

SS_readstarter, SS_readdat, SS_readctl, SS_writestarter, SS_writeforecast, SS_writedat, SS_writectl

SS_readstarter *read starter file*

Description

read Stock Synthesis starter file into list object in R

Usage

```
SS_readstarter(file = "starter.ss", verbose = TRUE)
```

Arguments

file	Filename either with full path or relative to working directory.
verbose	Should there be verbose output while running the file?

Author(s)

Ian Taylor

See Also

SS_readforecast, SS_readdat, SS_readctl, SS_writestarter, SS_writeforecast, SS_writedat, SS_writectl

SS_recdevs *Insert a vector of recruitment deviations into the control file.*

Description

A function to insert a vector of recruitment deviations into the control file for simulation studies. This can also be achieved by using the .par file, but Ian Taylor prefers this approach for no good reason.

Usage

```
SS_recdevs(fyr, lyr, ctl = NULL, recdevs = NULL,
rescale = TRUE, scaleyrs = NULL, dir = "working_directory",
ctlfile = "control.ss_new", newctlfile = "control_modified.ss",
verbose = TRUE, writectl = TRUE, returnctl = FALSE, newmaxbias = NULL)
```

Arguments

fyr	First year of the recdev vector.
lyr	Last year of the recdev vector.
ctl	Either NULL to read anew or an already read control file. Default=NULL.
recdevs	Either NULL to generate anew or an already generated vector of recdevs. Default=NULL.
rescale	Should the recdevs be rescaled to have mean = 0 and std. deviation = sigmaR? Default=TRUE.
scaleyrs	Vector of years over which rescaling (if chosen) should occur.
dir	Directory where files are located. Default is to use the working directory in use by R. Default="working_directory".
ctlfile	Name of control file to modify. Default="control.ss_new".
newctlfile	Name of new file to output modified control file. Default="control_modified.ss".
verbose	Verbose output to R command line? Default=TRUE.
writectl	Write new file? Default=TRUE.
returnctl	Return contents ctl file as an object in the R workspace. Default=FALSE.
newmaxbias	Replace the maximum bias adjustment fraction with any non-NULL value. Default=NULL.

Author(s)

Ian Taylor

SS_splitdat *Split apart bootstrap data to make input file.*

Description

A function to split apart bootstrap data files created in data.ss_new. To get bootstraps, the input "N bootstrap file to produce" in starter.ss needs to be 3 or greater.

Usage

```
SS_splitdat(inpath = "working_directory", outpath = "working_directory",
inname = "data.ss_new", outpattern = "BootData", number = F,
verbose = T, fillblank = T, MLE = T, inputs = F, notes = "")
```

Arguments

inpath	Directory containing the input file. By default the working directory given by getwd() is used. Default="working_directory".
outpath	Directory into which the output file will be written. Default="working_directory".
inname	File name of input data file to be split. Default="Data.SS_New".
outpattern	File name of output data file. Default="BootData".
number	Append bootstrap number to the file name chosen in outpattern? Default=F.
verbose	Provide richer command line info of function progress? Default=T.
fillblank	Replace blank lines with "#". Helps with running on linux. Default=T.
MLE	Grab the maximum likelihood values from the second block in Data.SS_New (instead of bootstrap values or copies of inputs)? Default=T.
inputs	Grab the copy of the input values values from the first block in Data.SS_New (instead of MLE or bootstrap values)? Default=F.
notes	Notes to the top of the new file (comment indicator "#C" will be added). Default="".

Author(s)

Ian Taylor

SS_writectl *write control file*

Description

Write Stock Synthesis control file. Like SS_readctl, this function is not fully developed.

Usage

```
SS_writectl(ctllist, outfile, overwrite = F, verbose = T)
```

Arguments

ctllist	List object created by SS_readctl.
outfile	Filename for where to write new control file.
overwrite	Should existing files be overwritten? Default=F.
verbose	Should there be verbose output while running the file? Default=T.

Author(s)

Ian Taylor

See Also

SS_readstarter, SS_readforecast, SS_readdat, SS_readctl, SS_writestarter, SS_writeforecast, SS_writedat, SS_writectl

SS_writedat *write data file*

Description

write Stock Synthesis data file from list object in R which was probably created using SS_readdat

Usage

```
SS_writedat(datlist, outfile, overwrite = FALSE, verbose = TRUE)
```

Arguments

datlist	List object created by SS_readdat.
outfile	Filename for where to write new data file.
overwrite	Should existing files be overwritten? Default=FALSE.
verbose	Should there be verbose output while running the file?

SS_writeforecast *write forecast file*

Description

write Stock Synthesis forecast file from list object in R which was probably created using SS_readforecast

Usage

```
SS_writeforecast(mylist, dir = NULL, file = "forecast.ss",
nareas = 1, nfleets = 1, overwrite = FALSE, verbose = TRUE)
```

Arguments

mylist	List object created by SS_readforecast.
dir	Directory for new forecast file. Default=NULL (working directory).
file	Filename for new forecast file. Default="forecast.ss".
nareas	Number of areas in the model (necessary to get formatting correct).
nfleets	Number of fleets in the model (necessary to get formatting correct).
overwrite	Should existing files be overwritten? Default=FALSE.
verbose	Should there be verbose output while running the file? Default=TRUE.

Author(s)

Ian Taylor

See Also

SS_readstarter, SS_readforecast, SS_readdat, SS_readctl, SS_writestarter, SS_writedat, SS_writectl

---

SS_writestarter *write starter file*

Description

write Stock Synthesis starter file from list object in R which was probably created using SS_readstarter

Usage

```
SS_writestarter(mylist, dir = NULL, file = "starter.ss", overwrite = F,
verbose = T)
```

Arguments

mylist	List object created by SS_readstarter.
dir	Directory for new starter file. Default=NULL (working directory).
file	Filename for new starter file. Default="starter.ss".
overwrite	Should existing files be overwritten? Default=F.
verbose	Should there be verbose output while running the file? Default=T.

Author(s)

Ian Taylor

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stackpoly *function "stackpoly" by Jim Lemon from "plotrix" package*

Description

Plot one or more columns of numeric values as the top edges of polygons instead of lines.

Usage

```
stackpoly(x, y, main = "", xlab = "", ylab = "", xat = NA, xaxlab = NA,
xlim = NA, ylim = NA, lty = 1, border = NA, col = NA, axis4 = F, ...)
```

Arguments

x	A numeric data frame or matrix with the 'x' values. If 'y' is NULL, these will become the 'y' values and the 'x' positions will be the integers from 1 to dim(x)[1].
y	The 'y' values.
main	The title for the plot.
xlab	x axis labels for the plot.
ylab	y axis labels for the plot.
xat	Where to put the optional xaxlabs.
xaxlab	Optional labels for the x positions.
xlim	Optional x limits.
ylim	Optional y limits.
lty	Line type for the polygon borders.
border	Color for the polygon borders.
col	Color to fill the polygons. If NULL, 'rainbow' will be called to generate the colors. If NA, the polygons will not be filled.
axis4	option to add an axis on the right hand side
...	Additional arguments passed to 'plot'.

Author(s)

Jim Lemon

References

http://cran.r-project.org/web/packages/plotrix/index.html

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update_r4ss_files *Updates r4ss files to newest versions on web.*

Description

Sources files containing R functions r4ss package from the google code repository. These may often be newer than those available form CRAN mirrors. It is probably wise to run this function every time you load the r4ss library.

Usage

```
update_r4ss_files(local = NULL, save = FALSE, revision = "newest")
```

Arguments

local	A local directory from which to source the files instead of getting them from the web.
save	If TRUE, then copy files from web to local directory, then source from this same local directory
revision	Either "newest" (the default), or an optional revision number of the files to source. These numbers are found within the list of changes to the r4ss code at http://code.google.com/p/r4ss/source/list. If you're using an out-of-date version of SS, or some recent update to the code isn't working for your model, an older revision may help. Otherwise, we recommend using the newest revision.

Author(s)

Ian Taylor

Examples

```
## Not run:
update_r4ss_files()
# getting file names from http://r4ss.googlecode.com/svn/trunk/
# most recent change: Today (6 hours ago)
# 64 files found in http://r4ss.googlecode.com/svn/trunk/
#   sourcing IOTCmove.R
#   sourcing RebuildPlot.R
#   sourcing SSFishGraph.R
#   sourcing SS_changepars.R
#   sourcing SS_fitbiasramp.R
#   sourcing SS_makedatlist.R
#   ...
#   sourcing stackpoly.R
#   sourcing update_r4ss_files.R
# update complete.

# copy files from web to local directory and then source them
update_r4ss_files(local='c:/SS/R/r4ss_files/',save=T)

# source files from a local directory (i.e. if no network available)
update_r4ss_files(local='c:/SS/R/r4ss_files/',save=F)

# update the updater function to get the new options:
source("http://r4ss.googlecode.com/svn/trunk/update_r4ss_files.R")

# get version 523 (for latest version, no "revision" input is needed)
update_r4ss_files(revision=523)


## End(Not run)
```

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