Package: PEcAn.photosynthesis (via r-universe)

March 14, 2025

Type Package

Title PEcAn functions used for leaf-level photosynthesis calculations

Version 1.7.3.9000

Description The Predictive Ecosystem Carbon Analyzer (PEcAn) is a scientific workflow management tool that is designed to simplify the management of model parameterization, execution, and analysis. The goal of PECAn is to streamline the interaction between data and models, and to improve the efficacy of scientific investigation. The PEcAn.photosynthesis package contains functions used in the Hierarchical Bayesian calibration of the Farquhar et al 1980 model.

Depends rjags

Imports coda (>= 0.18), utils, graphics, stats

Suggests knitr (>= 1.42), rmarkdown (>= 2.19), markdown

SystemRequirements JAGS (>=2.2.0)

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LazyLoad yes

LazyData FALSE

Encoding UTF-8

RoxygenNote 7.3.2

VignetteBuilder knitr, rmarkdown

Config/pak/sysreqs jags

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

RemoteUrl https://github.com/PecanProject/pecan

RemoteRef HEAD

RemoteSha 97e61070b67901b2fa9aa727c73fdaf98a69a70c

RemoteSubdir modules/photosynthesis

Contents

`estimate_mode` *estimate_mode*

Description

estimate_mode

Usage

```
estimate_mode(x, adjust = 0.1)
```

Arguments

`x`	numeric values
`adjust`	passed to stats::density

Author(s)

Mike Dietze

Xiaohui Feng

`fitA` *fitA*

Description

fitA

Usage

```
fitA(flux.data, cov.data = NULL, model = NULL)
```

Arguments

flux.data	data.frame of Licor data, concatenated by rows, and with a leading column 'fname' that is used to count the number of curves and match to covariates
cov.data	data.frame of covariate data. Column names used in formulas
model	list including at least 6 components: the fixed effects model for alpha (a.fixed) and Vcmax (V.fixed), the random effects for these (a.random, V.random), the variable used to match the gas-exchange and covariate data (match), and the number of MCMC interations (n.iter). Additional optional arguments: TPU = TRUE turns on TPU limitation; Temp == 'Bernacchi01' turns on the Bernacchi et al 2001 temperature correction. If this is turned on all parameters are estimated for 25C, otherwise no temperature correction is applied. Setting Temp = 'June2004' will turn on the June et al 2004 Funct Plant Biol temperature correction to Jmax. Note: these two corrections are not mutually exclusive, you can set Temp = c('June2004','Bernacchi2001') Right now the fixed effects are specified as a string using the standard R lm formula syntax, but without the LHS variable (e.g. '~ SLA + chl + SLA:chl'). The tilde is optional. For random effects, the two options right now are just 'leaf' for leaf-level random effects and NULL. 'model' has a default that sets all effects to NULL (fit one curve to all data) and n.iter=1000.

Author(s)

Mike Dietze

Xiaohui Feng

Licor_QC *Licor_QC*

Description

Licor_QC

Usage

```
Licor_QC(dat, curve = c("ACi", "AQ"), tol = 0.05)
```

Arguments

dat	data frame
curve	Whether to do Quality Control by examining the 'ACi' curve, the 'AQ' curve, or both
tol	Code automatically tries to separate ACi and AQ curves in the same dataset by detecting the 'reference' condition for light and CO2 respectively. This is the relative error around the mode in that detection.

Author(s)

Mike Dietze

`plot_photo` *plot_photo*

Description

plot_photo

Usage

```
plot_photo(data, out, curve = c("ACi", "AQ"), tol = 0.05, byLeaf = TRUE)
```

Arguments

`data`	input data
`out`	fitted model output from `fitA`
`curve`	Whether to do Quality Control by examining the 'ACi' curve, the 'AQ' curve, or both
`tol`	Code automatically tries to separate ACi and AQ curves in the same dataset by detecting the 'reference' condition for light and CO2 respectively. This is the relative error around the mode in that detection.
`byLeaf`	whether to plot fits on a leaf-by-leaf basis

Author(s)

Mike Dietze

`read_Licor` *read_Licor*

Description

read_Licor

Usage

```
read_Licor(filename, sep = "\t", ...)
```

Arguments

`filename`	name of the file to read
`sep`	file delimiter. defaults to tab
`...`	optional arguements forwarded to read.table

Author(s)

Mike Dietze

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