

Package: FEWSR (via r-universe)

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Title FEWS Multiplant Model

Version 1.0.0

Depends R (>= 3.3.0)

Imports rio (>= 0.5.8), readxl (>= 1.0.0), openxlsx (>= 4.1.0),
grDevices, ggplot2 (>= 2.2.0), gWidgets2 (>= 1.0.7),
gWidgets2tcltk (>= 1.0-6), fastmatch, stringi, methods,
assertthat, fpCompare, utils, tcltk (>= 2.7.0), data.table (>= 1.10.2)

Suggests Rcpp (>= 0.11.6), knitr, rmarkdown

Author Timothy H. Diehl [aut, cre] (Microsoft Excel(R) spreadsheets),
Irucka Embry [aut] (R code)

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Description FEWS river, lake, and pond models used to obtain the
evapotranspiration from surface waters in power plants. The
FEWS models appeared in 2 USGS reports
(<http://pubs.er.usgs.gov/publication/sir20145184> and
<http://pubs.er.usgs.gov/publication/sir20135188>). Irucka Embry,
while a Cherokee Nation Technology Solutions (CNTS) USGS
Contractor, translated those functions into R.

URL <https://gitlab.com/iembry/FEWSR>

BugReports <https://gitlab.com/iembry/FEWSR/issues>

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Description

FEWSR FEWS river, lake, and pond models used to obtain the evapotranspiration from surface waters in power plants. The FEWS models appeared in 2 USGS reports (<http://pubs.er.usgs.gov/publication/sir20145184> and <http://pubs.er.usgs.gov/publication/sir20135188>). Irucka Embry, while a Cherokee Nation Technology Solutions (CNTS) USGS Contractor, translated those functions into R.

fewsr1	<i>FEWS Multiplant plants – lake, pond, river (version 3.104) – interactive file input</i>
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Description

Draft Model of Forced Evaporation from a Water Surface, with user choice of wind function Multiplant Lake/Pond/River Version 3.104 - 2012/12/15

Usage

```
fewsr1(  
  file = tk_choose.files(default = "", caption = "Select file to open", multi = FALSE,  
    filters = matrix(c("Comma-separated value file", ".csv", "MS Excel spreadsheet",  
      ".xlsx", "MS Excel 97-2003 spreadsheet", ".xls"), 8, 2, byrow = TRUE)),  
  sheet = 1,  
  type = c("lake", "pond", "river"),  
  output = c("csv", "xlsx", "both")  
)
```

Arguments

file	Input file will be selected through a file dialog [.xls(x) or .csv]
sheet	Sheet number or sheet name for the input file
type	The type of surface water feature (lake, pond, river)
output	The output format of the resulting spreadsheet (.xlsx, .csv, or both)

Value

spreadsheet with the output parameters and a plot of the average evaporation per month

Author(s)

Irucka Embry, Timothy H. Diehl (Microsoft Excel spreadsheets)

Source

1. r - How can I check if a file is empty? - Stack Overflow answered by Konrad Rudolph and edited by Geekuna Matata on Apr 23 2014. See <https://stackoverflow.com/questions/23254002/how-can-i-check-if-a-file-is-empty>.
2. r - Better error message for stopifnot? - Stack Overflow answered by Andrie on Dec 1 2011. See <https://stackoverflow.com/questions/8343509/better-error-message-for-stopifnot>.
3. RDocumentation: TclInterface tcltk. See <http://www.rdocumentation.org/packages/tcltk/versions/3.3.1/topics/TclInterface>.
4. r - Convert column classes in data.table - Stack Overflow answered by Matt Dowle on Dec 27 2013. See <https://stackoverflow.com/questions/7813578/convert-column-classes-in-data-table>.
5. r - removing columns with NA values only - Stack Overflow answered by David Arenburg on Sep 18 2014. See <https://stackoverflow.com/questions/25922385/removing-columns-with-na-values-only>.
6. r - Reduce data.table by group with with different actions depending on column class? - Stack Overflow answered by Ananda Mahto on May 9 2014. See <https://stackoverflow.com/questions/23566343/reduce-data-table-by-group-with-with-different-actions-depending-on-column-class>.
7. r - operations (+, -, /, *) on unequal-sized data.table - Stack Overflow asked and answered by iembry on Jul 24 2014 and Aug 14 2014, respectively. See <https://stackoverflow.com/questions/24940246/operations-on-unequal-sized-data-table>.
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10. r - How to replace NA values in a table *for selected columns*? data.frame, data.table - Stack Overflow edited BY eddi on Jan 19 2016 on Nov 17 2011. See <https://stackoverflow.com/questions/19379081/how-to-replace-na-values-in-a-table-for-selected-columns-data-frame-data-table>.

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13. R summarizing multiple columns with data.table - Stack Overflow answered by Ricardo Saporta on May 13 2013. See <https://stackoverflow.com/questions/16513827/r-summarizing-multiple-columns-w-16513949>.
14. performance Yearly comparison timeseries ggplot2 R - Stack Overflow answered and edited by Ruthger Righart on Mar 19 2015. See <https://stackoverflow.com/questions/29124724/yearly-comparison-timeseries-ggplot2-r/29147348>.
15. r - ggplot2 line chart gives "geom_path: Each group consist of only one observation. Do you need to adjust the group aesthetic?" - Stack Overflow answered by Mario B. on Mar 12 2015. See <https://stackoverflow.com/questions/27082601/ggplot2-line-chart-gives-geom-path-each-group-27082601>.
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17. James Wettenhall & Philippe Grosjean, File Open/Save dialogs in R tcltk, December 01, 2015. See <http://www.sciviews.org/recipes/tcltk/TclTk-file-open-save-dialogs/>.
18. performance - R: need help to speed up creating new columns in a data.frame - Stack Overflow answered by Thell on Apr 26 2014 and edited by Thell on Apr 27 2014. See <https://stackoverflow.com/questions/23309300/r-need-help-to-speed-up-creating-new-columns-in-a-data-fr-23312458>.
19. warnings - How do I get rid of the NOTE's generated by R CMD check when using for example ddply in my package? - Stack Overflow answered by shadow on Mar 4 2015 and edited by shadow on Mar 5 2015. See <https://stackoverflow.com/questions/28851812/how-do-i-get-rid-of-the-not-28851812>.
20. How to check file extensions in R - Stack Overflow answered by lebatnok on May 17 2014. See <https://stackoverflow.com/questions/23713284/how-to-check-file-extensions-in-r-23713284>.
21. multiple output filenames in R - Stack Overflow asked and edited by Gabelins on Feb 1 2013. See <https://stackoverflow.com/questions/14651594/multiple-output-filenames-in-r-14651594>.
22. r - Regex return file name, remove path and file extension - Stack Overflow answered and edited by Ananda Mahto on Feb 25 2013. See <https://stackoverflow.com/questions/15073753/regex-return-file-name-remove-path-and-file-extension/15073919>.
23. r - Order data frame rows according to vector with specific order - Stack Overflow answered and edited by Edward on Aug 15 2012. See <https://stackoverflow.com/questions/11977102/order-data-frame-rows-according-to-vector-with-specific-order-11977102>.

References

1. Withdrawal and consumption of water by thermoelectric power plants in the United States, 2010: A product of the USGS National Water Census and the USGS National Streamflow Information Program By: Timothy H. Diehl and Melissa A. Harris, Scientific Investigations Report 2014-5184. See <http://pubs.er.usgs.gov/publication/sir20145184>.

2. Methods for estimating water consumption for thermoelectric power plants in the United States: USGS National Water Census and National Streamflow Information Program By: Timothy H. Diehl, Melissa Harris, Jennifer C. Murphy, Susan S. Hutson, and David E. Ladd, Scientific Investigations Report 2013-5188. See <http://pubs.er.usgs.gov/publication/sir20135188>.

Examples

```
## Not run:
library("FEWSR")
# Examples to check the input file format

# Copy and paste the following code into the R console if you
# wish to see the input file format for the Lake plants.
library("openxlsx")
openXL(file.path(system.file("extdata", "FEWS_BIG_Lake_plants_input.xlsx",
package = "FEWSR"))))
# opens the workbook using the default spreadsheet application

# Copy and paste the following code into the R console if you
# wish to see the input file format for the Pond plants.
library("openxlsx")
openXL(file.path(system.file("extdata", "FEWS_Pond_plants_input.xlsx",
package = "FEWSR"))))
# opens the workbook using the default spreadsheet application

# Copy and paste the following code into the R console if you
# wish to see the input file format for the River plants.
library("openxlsx")
openXL(file.path(system.file("extdata", "FEWS_River_plants_input.xlsx",
package = "FEWSR"))))
# opens the workbook using the default spreadsheet application

# Examples to show different use cases
fewsr1(sheet = "Input", type = "pond", output = "csv")
# The sheet name is "Input" and the surface water is pond

fewsr1(type = "river", output = "xlsx")
# The sheet number is 1 (default) and the surface water is river

fewsr1(sheet = 4, type = "lake", output = "both")
# The sheet number is 4 and the surface water is lake

## End(Not run)
```

fewsr2	<i>FEWS Multiplant plants – lake, pond, river (version 3.104) – non-interactive file input</i>
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Description

Draft Model of Forced Evaporation from a Water Surface, with user choice of wind function Multiplant Lake/Pond/River Version 3.104 - 2012/12/15

Usage

```
fewsr2(
  file,
  sheet = 1,
  type = c("lake", "pond", "river"),
  output = c("csv", "xlsx", "both")
)
```

Arguments

file	Path of input file chosen by the user [.xls(x) or .csv]
sheet	Sheet number or sheet name for the input file
type	The type of surface water feature (lake, pond, river)
output	The output format of the resulting spreadsheet (.xlsx, .csv, or both)

Value

spreadsheet with the output parameters and a plot of the average evaporation per month

Author(s)

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References

1. Withdrawal and consumption of water by thermoelectric power plants in the United States, 2010: A product of the USGS National Water Census and the USGS National Streamflow Information Program By: Timothy H. Diehl and Melissa A. Harris, Scientific Investigations Report 2014-5184. See <http://pubs.er.usgs.gov/publication/sir20145184>.
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Examples

```
## Not run:
library("FEWSR")
# Examples to check the input file format

# Copy and paste the following code into the R console if you
# wish to see the input file format for the Lake plants.
library("openxlsx")
openXL(file.path(system.file("extdata", "FEWS_BIG_Lake_plants_input.xlsx",
package = "FEWSR"))
# opens the workbook using the default spreadsheet application

# Copy and paste the following code into the R console if you
# wish to see the input file format for the Pond plants.
library("openxlsx")
openXL(file.path(file.path(system.file("extdata", "FEWS_Pond_plants_input.xlsx",
package = "FEWSR"))))
# opens the workbook using the default spreadsheet application

# Copy and paste the following code into the R console if you
# wish to see the input file format for the River plants.
library("openxlsx")
openXL(file.path(file.path(system.file("extdata", "FEWS_River_plants_input.xlsx",
```

```
package = "FEWSR")))  
  # opens the workbook using the default spreadsheet application  
  
# Examples to show different use cases  
fewsr2(file.path(system.file("extdata", "FEWS_Pond_plants_input.xlsx",  
package = "FEWSR"), type = "pond", output = "csv"))  
# The sheet number is 1 (default) and the surface water is pond  
  
fewsr2(file.path(system.file("extdata", "FEWS_River_plants_input.xlsx",  
package = "FEWSR"), type = "river", output = "xlsx"))  
# The sheet number is 1 (default) and the surface water is river  
  
fewsr2(file.path(system.file("extdata", "FEWS_BIG_Lake_plants_input.xlsx",  
package = "FEWSR"), type = "lake", output = "both"))  
# The sheet number is 1 (default) and the surface water is lake  
  
## End(Not run)
```

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