

# Package ‘AeroEvapR’

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**Type** Package

**Title** Estimating Reservoir Evaporation via Aerodynamic Approach

**Version** 0.1.6

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**Description** Developed as an 'R' alternative to the 'AeroEvap' model developed by the Desert Research Institute (DRI) in 'python' <<https://github.com/WSWUP/AeroEvap/blob/master/README.rst>> which estimates open water evaporation using the aerodynamic mass transfer approach.

**Encoding** UTF-8

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**Depends** R (>= 4.2.0)

**Imports** readxl, data.table, openxlsx

**Suggests** knitr, rmarkdown, dplyr, ggplot2, lubridate

**VignetteBuilder** knitr

**NeedsCompilation** no

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**Repository** CRAN

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aero\_calc

*aero\_calc***Description**

This package uses the aerodynamic mass transfer approach on variables given in the input file to estimate open water evaporation. The output includes calculated evaporation parameters as well as the input values.

**Usage**

```
aero_calc(df, sensor_height, timestep, out_file_format, out_file_name, verbose)
```

**Arguments**

df	Dataframe containing input data. Must include all data components ('T_skin', 'WS', 'P', 'T_air', 'RH', 'date'). Ensure date is formatted as a date object before reading into function.
sensor_height	Sensor height (m)
timestep	Measurement frequency (s). For example, hourly data would be timestep = 3600
out_file_format	Format for output file
out_file_name	Name for saved file
verbose	Logical indicator to hide output messages (FALSE will hide messages)

**Details**

Returns a list with calculated values for evaporation (mm/timestep), bulk transfer coefficient, vapor pressure deficit (kPa), and most stability value

**Value**

SH	Sensor height (m)
dt	Timestep
E	Evaporation (mm/timestep)
Ce	bulk transfer coefficient (unitless)
VPD	Vapor pressure deficit (kPa)
stability	Monin-Obhukov Similarity Theory stability parameter (z/L)

**Note**

This package was developed based on AeroEvap, a Python implementation of the aerodynamic mass-transfer approach for open-water evaporation. See [AeroEvap on GitHub](#).

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**References**

AeroEvap (Python version): <https://github.com/WSWUP/AeroEvap/tree/master>

**Examples**

```
old_par <- par(no.readonly = TRUE)

df <- data.frame(
  date = seq(as.POSIXct("2020-01-01"), by = 3600, length.out = 5),
  T_skin = c(20, 21, 22, 21, 20),
  WS = c(3, 3.5, 4, 3.8, 3.2),
  P = rep(101.3, 5),
  T_air = c(18, 18.5, 19, 18.8, 18.2),
  RH = c(50, 52, 51, 49, 50)
)

# Run aero_calc with sample inputs
result <- aero_calc(df,
  sensor_height = 2,
  timestep = 3600,
  out_file_format = "none",
  out_file_name = NULL,
  verbose = TRUE)

# View results
print(result)

# Reset graphical parameters
par(old_par)
```

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