R documentation

of 'AeronetOC2019.Rd' etc.

June 2, 2020

AeronetOC2019   *Collection of coastal AeronetOC water spectra till 2019*

Description

A dataframe contains AeronetOC data

Usage

AeronetOC2019

Format

A dataframe with 10667 rows by 14 cols

Details

AeronetOC is collected from Level 2 products provided by Aeronet Ocean Color stations located in great inland lakes (i.e., Lake_Erie, Palgrunden) and coastal waters (i.e., COVE_SEAPRISM, Galata_Platform, Gloria, Gustav_Dalen_Tower, Helsinki_Lighthouse, LISCO, MVCO, and Zeebrugge-MOW1) with bands at 410, 440, 490, 530, 550, 667, 869 nm.

Note

Colnames are "SampleID, X410nm, X440nm, X490nm, X530nm, X550nm, X667nm, X869nm, X1020nm, Pressure, Wind_Speed, Chlorophyll.a, Sea_Surface_Reflectance, Ozone"

References

All these data are available at https://aeronet.gsfc.nasa.gov.

apply_FCM_m   *Apply FCM_m to new input Rrs*

Description

Application of FCM_m method for new Rrs data based on default cluster settings or user-defined clusters (trained by FCM.new).

Usage

```
apply_FCM_m(
  Rrs,
  wavelength = NULL,
  Rrs_clusters = NULL,
  m_used = 1.36,
  stand = FALSE,
  default.cluster = TRUE,
  quality_check = FALSE,
  option.plot = FALSE
)
```

Arguments

Rrs	Data.frame, the input Rrs of FCM.
wavelength	Numeric vector, used for applying FCM. Default use the data from `Bi_clusters.rda`
Rrs_clusters	Data.frame, used for applying FCM. Default use the data from `Bi_clusters.rda`
m_used	Number, Used fuzzifier value
stand	Logical, whether to normalized the Rrs data. Default as `FALSE` means do not.
default.cluster	
	Logical, whether to use the default clusters. Default use the data from `Bi_clusters.rda`
quality_check	Logical, quality chech option (default as `FALSE`)
option.plot	Logical, whether to plot the result. Default as `FALSE`

Value

A `list` including several results of function `apply_FCM_m()`

- **x** The raw input Rrs dataframe with unit sr^-1
- **x.stand** The standardized Rrs dataframe, if `stand=F`
- **d** Distance to each cluster
- **u** Membership values
- **Area** Spectral intergration of each sample
- **cluster** Defined by the maximum of membership
- **quality** The quality of the cluster results.
- **m.used** The used value of fuzzifier(m)
- **K** Cluster number
- **p.group** A ggplot list for plotting the cluster result
- **p.group.facet** `p.group` with facet to see each cluster results more clearly
- **dt.melt** Dataframe used for ggplot

References

Bi S, Li Y, Xu J, et al. Optical classification of inland waters based on an improved Fuzzy C-Means method[J]. Optics Express, 2019, 27(24): 34838-34856.

See Also

Other Fuzzy cluster functions: `FCM.new()`, `FuzzifierDetermination()`, `apply_to_image()`, `plot_spec_from_df()`

Examples

```
## Not run:
library(FCMm)
data("WaterSpec35")
data("Bi_clusters")
Rrs <- WaterSpec35[,3:17]
result <- apply_FCM_m(Rrs=Rrs, option.plot=TRUE)

## End(Not run)
```

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