Package: croc (via r-universe)

May 11, 2026

Type Package

Title Tools for Ocean Colour

Version 0.0.9

Description Work with data from NASA's ocean colour data, primarily the 'Level-3 bin' files. There are functions to read and work with the ragged array 'L3 bins' mesh and calculate biophysical properties from remote sensing reflectance data.

License GPL-3

LazyLoad yes

Depends dplyr

Imports geosphere, progress, sp, raster, rlang, rhdf5, tibble, Rcpp

Suggests testthat, BiocInstaller, zlibbioc

NeedsCompilation no

RoxygenNote 6.0.1

URL https://github.com/sosoc/croc

BugReports https://github.com/sosoc/croc/issues

LinkingTo Rcpp

Config/pak/sysreqs libgdal-dev gdal-bin libgeos-dev libssl-dev libproj-dev libsqlite3-dev

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

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RemoteUrl https://github.com/sosoc/croc

RemoteRef HEAD

RemoteSha e91fcd64017e955922615244577fc8c803cb9a76

Contents

`roc-package` *R tools for ocean colour.*

Description

Read data from Ocean Color Level-3 bin files.

Details

Package:	roc
Type:	Package
Version:	0.0-1
Date:	2014-08-28
License:	GPL-3

Author(s)

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References

https://github.com/mdsumner, http://www.hdfgroup.org/, http://oceandata.sci.gsfc.nasa.gov/

bin2bounds *Calculate bin boundaries from bin number*

Description

Calculate bin boundaries from bin number

Usage

```
bin2bounds(bin, NUMROWS)
```

Arguments

bin	bin number
NUMROWS	relevant number of L3 bin rows

bin2lonlat *Longitude and latitude from bin number.*

Description

Generate longitude and latitude coordinates from bin number.

Usage

```
bin2lonlat(bins, nrows)
```

Arguments

bins	bin number
nrows	number of rows in this grid

binmap *Bin map*

Description

mapping between bins and a given raster

Usage

```
binmap(bin, ras, init = NULL)
```

Arguments

bin	bin number
ras	RasterLayer
init	optional initial values for bin structure

chla *Estimate chlorophyll-a from NASA ocean colour.*

Description

Estimate chlorophyll-a from Remote Sensing Reflectance wavelengths. Use SeaWiFS or MODISA with original or Johnson algorithm for the Southern Ocean.

Usage

```
chla(x, sensor, algo = c("oceancolor", "johnson"), quiet = TRUE, ...)
```

Arguments

x	list object with Remote Sensing Reflectance wavelengths (see Details)
sensor	which satellite sensor
algo	algorithm to use, oceancolor or Johnson et al. (2013)
quiet	logical to emit warnings or not
...	not used

Examples

```
#f <- "S1998001.L3b_DAY_RRS.main"
#x <- readL3(f)
#asub <- x$bin_num < initlist()$totbins / 2
#ll <- bin2lonlat(x$bin_num[asub])
#sw <- swchl(x)[asub]
#js <- swchl(x, johnson = TRUE)[asub]
#par(mfrow = c(2,1))
#plot(ll, col = palr::chlPal(sw), pch = ".")
#plot(ll, col = palr::chlPal(js), pch = ".")

## setup a polar raster
```

`crop_init` *Crop L3 init object with an extent*

Description

Crop L3 list, returns bins that fall within the extent.

Usage

```
crop_init(x, ext)
```

Arguments

`x`	initbin object
`ext`	raster extent object, or object to create an extent from

Value

integer vector of bins

Examples

```
## Not run:  init <- initbin(24)
crop_init(init, extent(100, 110, -50, -45))

## End(Not run)
```

initbin *Initialize values for a particular binning*

Description

Set up the basic values for the bin scheme for given number of rows.

Usage

```
initbin(NUMROWS = 2160)
```

Arguments

NUMROWS	relevant number of L3 bin rows

lonlat2bin *Generate bin number from longitude latitude.*

Description

Bin number from longitude and latitude for a given grid with NUMROWS unique latitudes.

Usage

```
lonlat2bin(lon, lat, NUMROWS)
```

Arguments

lon	longitude
lat	latitude
NUMROWS	number of rows

lonlatFromCell *Raster cell longitude and latitudes*

Description

Extract longitude and latitude of raster cells.

Usage

```
lonlatFromCell(object, cell = NULL, spatial = FALSE)
```

Arguments

object	a raster object
cell	the cell numbers
spatial	return locations as SpatialPoints object instead of a matrix.

Details

Extract the longitude and latitude of the center of the requested cells of a Raster* object, similar to `xyFromCell`.

from SGAT

Value

the lon,lat locations for the requested cells.

oceandata-grids *Standard Mapped Image*

Description

SMI is the Standard Mapped Image, a longitude-latitude affine grid at zonally-native resolution. See details.

Usage

```
bin_smi(bins, value, platform = "MODISA")
```

Arguments

bins	bin index values
value	values with bins
platform	name of platform, e.g. MODISA, SeaWiFS

Details

SeaWiFS is 2160 rows for 9.2 km resolution MODISA is 4320 rows for 4.6 km resolution (also provided in 9.2km) VIIRS is 4320 rows like MODIS. The zonal spread of the L3 bins is applied to the longitude-latitude regular grid by _a simple method that changed slightly in 2017 ..._ is trivial but inherently lossy. The initial focus of 'roc' on the L3 bins was precisely to put focus on the statistical fidelity features of the L3 bins, as per Technical Report No. 32.

(There's no reason to differentiate MODISA and MODIST in terms of the grid it's just that this token was chosen to distinguish from SeaWiFS in the first versions, and this might be generalized in future).

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prod_BeFa *Primary production*

Description

Primary production

Usage

```
prod_BeFa(chla, irrad, stemp, daylength)
```

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read_L3_file *Read Level-3 ocean colour.*

Description

Read the compound types (i.e. tables of variables) from ocean colour L3 NetCDF files.

Usage

```
read_binlist(file)

read_compound(file, compound_vars = NULL, select_stat = c("sum",
  "sum_squared"))
```

Arguments

file	file path
compound_vars	the variables to read
select_stat	defaults to "sum" and "sum_squared"

Details

'read_binlist' for just the 'BinList' 'read_compound' for just the compound data (not implemented) read_L3_file for everything at once

Compound vars we would usually want for MODISA are "BinList" and 'c("Rrs_443", "Rrs_488", "Rrs_555", "Rrs_547")' since these are used for calculating chlorophyll-a. This function is not very general yet, you'll always get the BinList. This function is specific to files in this form, for any of the platforms (MODISA here): https://oceandata.sci.gsfc.nasa.gov/MODIS-Aqua/L3BIN

Value

data frame of bin numbers, number of observations and scenes, weights and time record, a data frame of the compound variables and bin details

Examples

```
f <- system.file("extdata", "ocfiles", "S2008001.L3b_DAY_CHL.nc", package = "croc")
bins <- read_binlist(f)
bin2lonlat(bins$bin_num, 2160)
bin2bounds(bins$bin_num, 2160)


read_L3_file(system.file("extdata/ocfiles/S2008001.L3b_DAY_RRS.nc", package = "croc"))
```

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read_smi_image *Read NASA ocean colour browser images (PNG format)*

Description

Read ocean colour imagery from the NASA site, files will be downloaded and read in with `brick`. If a file with an identical name is already present in the current working directory the download is skipped.

Usage

```
read_smi_image(date, platform = c(A = "MODISA", S = "SeaWiFS"), tres = c(DAY
  = "", `8D` = "8 days", MO = "1 month", YR = "1 year"), varname = c(CHL =
  "chlor_a"))
```

Arguments

`date`	date of image to find
`platform`	which satellite platform (currently MODISA and SeaWiFS)
`tres`	temporal resolution to read
`varname`	name of variable (currently chlorophyll-a)

Index