

Package ‘lazyraster’

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Version 0.5.0

Title Generate Raster Data Lazily from 'GDAL'

Description Read raster data at a specified resolution on-demand via 'GDAL' (the Geospatial Data Abstraction Library <<https://gdal.org/>>). Augments the 'raster' package by never reading data from a raster source until necessary for generating an in-memory 'raster' object. A 'lazyraster' object may be cropped and converted to 'raster' object, and by default will only read a small amount of data sufficient for an overall summary. The amount of data read can be controlled by specifying the output dimensions.

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Encoding UTF-8

LazyData true

ByteCompile true

RoxygenNote 6.1.1

Imports graphics, raster, vapour (>= 0.4.0), methods, quadmesh (>= 0.4.0)

Suggests palr, testthat (>= 2.1.0)

URL <https://github.com/hypertidy/lazyraster>

BugReports <https://github.com/hypertidy/lazyraster/issues>

NeedsCompilation no

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as_raster	<i>Convert to in-memory raster</i>
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Description

Create an actual `raster::raster` object by breaking the lazy contract and demanding pixel values at a given resolution.

Usage

```
as_raster(x, dim = NULL, resample = "NearestNeighbour",
         native = FALSE)
```

Arguments

x	a <code>lazyraster</code>
dim	dimensions, pixel size in rows and columns
resample	resampling method, see <code>vapour::vapour_read_raster</code>
native	return raster at native resolution, default is FALSE

Details

Control the dimensions and method for resampling with the 'dim' and 'resample' arguments. When `native = TRUE` the `dim` argument is ignored, and no resampling is performed.

Value

a regular raster 'BasicRaster' in-memory object

lazyraster	<i>Lazy raster</i>
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Description

A `lazyraster` is a metadata-only shell around a raster file source. Only metadata is read and used for extent and resolution logic. A `lazyraster` may be cropped lazily and if plotted or converted to in-memory raster only a reasonable level-of-detail is actually used.

Usage

```
lazyraster(gdalsource, band = 1, sds = NULL, ...)
```

Arguments

gdalsource	a file name or other source string
band	which band to use, defaults to 1
sds	which subdataset to use, set to 1 if in doubt (see vapour::vapour_sds_names)
...	ignored for now

Details

See `crop()` for cropping - it works the same but returns a lazyraster, and `as_raster()` for converting to an in-memory raster.

Value

a lazyraster object, a simple shell around a GDAL raster source

Warning

If the inferred Y extents appear to be reversed ($y_{max} > y_{min}$) then they are reversed, with a warning. This occurs for any GDAL data source that does not have a geotransform and so is required for use with raster. This might not be the right interpretation, geotransforms are very general and it might mean the data is meant to be oriented that way. (I don't know why GDAL sets a positive Y pixel height as the default, it's a bit of a pain - should the data be flipped, or should Y be interpreted negative - no way to know!).

Examples

```
sstfile <- system.file("extdata/sst.tif", package = "vapour")
lazyraster(sstfile)
## convert to raster (in memory, but not all of the source)
as_raster(lazyraster(sstfile))
## crop and stay as lazyraster
crop(lazyraster(sstfile), raster::extent(142, 143, -50, -45))
## crop and convert to raster
as_raster(crop(lazyraster(sstfile), raster::extent(142, 143, -50, -45)))
```

lazyraster-methods *Lazy raster S3 methods*

Description

Print and format for lazyraster.

Plot for lazyraster, data pulled on-demand at a reasonable level-of-detail.

Usage

```
## S3 method for class 'lazyraster'
print(x, ...)

## S3 method for class 'lazyraster'
format(x, ...)

## S3 method for class 'lazyraster'
plot(x, y, ...)
```

Arguments

x	a lazyraster
...	passed to raster::plot
y	ignored

Details

Data is pulled from the GDAL source at a resolution suited for the currently open graphics device.

Examples

```
f1 <- system.file("images/ga_srtm.png", package = "lazyraster")
print(lazyraster(f1))
plot(lazyraster(f1))
```

lazyraster-raster-S4 *Raster methods (S4) for lazyraster.*

Description

These methods are generics from the raster package, extended to work for lazyrasters.

Usage

```
## S4 method for signature 'lazyraster'
crop(x, y, ...)

raster_lazyraster(x, ...)

extent_lazyraster(x, ...)
```

Arguments

x	various (raster, extent)
y	an object with extent (for crop)
...	arguments passed to underlying raster function

Details

For `crop()` this set an active window of data using the same `crop()` function as the raster package. This is the data window that will be pulled by conversion to an actual raster by `as_raster()`.

Value

`lazyraster()` and `crop()` return a lazyraster object, `extent()` returns a regular raster extent

See Also

`raster::raster()`, `raster::extent()`, `raster::crop()`

Examples

```
sstfile <- system.file("extdata/sst.tif", package = "vapour")
lr <- lazyraster(sstfile)
## crop and stay as lazyraster
crop(lazyraster(sstfile), raster::extent(142, 143, -50, -45))
```

quadmesh

Quadmesh for lazyrasters

Description

Provides a re-exported generic quadmesh and a method for lazyraster.

Usage

```
## S3 method for class 'lazyraster'
quadmesh(x, z = x, na.rm = FALSE, ...,
         texture = NULL, texture_filename = NULL)
```

Arguments

<code>x</code>	raster object for mesh structure
<code>z</code>	raster object for height values
<code>na.rm</code>	remove quads where missing values?
<code>...</code>	arguments passed to <code>as_raster</code> , for both <code>x</code> and <code>z</code> if necessary
<code>texture</code>	optional input RGB raster, 3-layers
<code>texture_filename</code>	optional input file path for PNG texture

Details

A quadmesh is a 'rgl::mesh3d' extension, and can be plotted in 3D with 'rgl::shade3d'.

Value

a quadmesh, derived from 'rgl::mesh3d'

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