Package: copernicusR (via r-universe)

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Title R Interface to Copernicus Marine Service

Version 0.1.0

Description Provides an R interface to the Copernicus Marine Service for downloading and accessing marine data. Integrates with the official 'copernicusmarine' Python library through 'reticulate'. Requires Python 3.7+ and a free Copernicus Marine account. See <https://marine.copernicus.eu/> and <https://pypi.org/project/copernicusmarine/> for more information.

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URL https://github.com/HansTtito/copernicusR

BugReports https://github.com/HansTtito/copernicusR/issues

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Contents

copernicus_clear_credentials 2
copernicus_download 2
copernicus_get_credentials 4
copernicus_is_ready 4
copernicus_open_dataset 5
copernicus_set_env_credentials 6
copernicus_setup_credentials 6
copernicus_test 7
copernicus_test_open 8
copernicus_validate_credentials 8
setup_copernicus 9

Index **11**

`copernicus_clear_credentials` *Clear Copernicus Marine credentials*

Description

Removes stored Copernicus Marine credentials from session options and environment variables.

Usage

```
copernicus_clear_credentials()
```

Value

Invisible TRUE.

Examples

```
copernicus_clear_credentials()
```

`copernicus_download` *Download data from Copernicus Marine*

Description

Downloads .nc files from the Copernicus Marine catalog. Allows specifying all options of the Python function. Uses stored credentials from options/environment variables if available.

Usage

```
copernicus_download(
  dataset_id,
  variables,
  start_date,
  end_date,
  bbox = c(-180, 179.92, -80, 90),
  depth = c(0.494, 0.494),
  dataset_version = "202406",
  output_file = NULL,
  username = NULL,
  password = NULL,
  verbose_download = TRUE,
  ...
)
```

Arguments

dataset_id	ID of the dataset (exact).
variables	Vector or list of variables to download.
start_date	Download start date (YYYY-MM-DD).
end_date	Download end date (YYYY-MM-DD).
bbox	Vector of 4 values (xmin, xmax, ymin, ymax) for the region.
depth	Vector of 2 values: minimum and maximum depth.
dataset_version	Dataset version.
output_file	Output file path. By default, generates one in tempdir().
username	Copernicus Marine username (optional, will try to get from stored credentials).
password	Copernicus Marine password (optional, will try to get from stored credentials).
verbose_download	Show detailed messages.
...	Other extra arguments passed to the Python function.

Value

Absolute path to the downloaded file, or NULL if it fails.

copernicus_get_credentials *Get Copernicus Marine credentials*

Description

Retrieves stored Copernicus Marine credentials from session options or environment variables.

Usage

```
copernicus_get_credentials(mask_password = TRUE)
```

Arguments

mask_password	Logical. Should password be masked in output? Default: TRUE.

Value

List with username and password (optionally masked).

Examples

```
# Get credentials (password masked)
copernicus_get_credentials()

# Get credentials (password visible - use with caution)
copernicus_get_credentials(mask_password = FALSE)
```

copernicus_is_ready *Check if Copernicus Marine Python module is ready*

Description

Checks if the Python module is properly loaded and credentials are configured to use Copernicus Marine. Returns TRUE if everything is ready.

Usage

```
copernicus_is_ready(verbose = TRUE)
```

Arguments

verbose	Show detailed status information.

Value

TRUE if the Python module is loaded and credentials are available.

`copernicus_open_dataset` *Open dataset from Copernicus Marine without download*

Description

Opens a dataset directly from Copernicus Marine using open_dataset. Returns a Python xarray.Dataset object that can be processed in R. Useful for exploring data without downloading full files. Uses stored credentials from options/environment variables if available.

Usage

```
copernicus_open_dataset(
  dataset_id,
  variables = NULL,
  start_date = NULL,
  end_date = NULL,
  bbox = NULL,
  depth = NULL,
  dataset_version = NULL,
  username = NULL,
  password = NULL,
  verbose_open = TRUE,
  ...
)
```

Arguments

`dataset_id`	ID of the dataset (exact).
`variables`	Vector or list of variables to open. If NULL, opens all.
`start_date`	Start date (YYYY-MM-DD). Optional.
`end_date`	End date (YYYY-MM-DD). Optional.
`bbox`	Vector of 4 values (xmin, xmax, ymin, ymax) for the region. Optional.
`depth`	Vector of 2 values: minimum and maximum depth. Optional.
`dataset_version`	Dataset version. Optional.
`username`	Copernicus Marine username (optional, will try to get from stored credentials).
`password`	Copernicus Marine password (optional, will try to get from stored credentials).
`verbose_open`	Show detailed messages.
`...`	Other extra arguments passed to the Python function.

Value

Python xarray.Dataset object, or NULL if it fails.

copernicus_set_env_credentials

Set Copernicus Marine credentials in environment file

Description

Helper function to set credentials in .Renviron file for persistent storage. This is more secure than storing in scripts.

Usage

```
copernicus_set_env_credentials(username, password, overwrite = FALSE)
```

Arguments

username	Character. Copernicus Marine username.
password	Character. Copernicus Marine password.
overwrite	Logical. Overwrite existing credentials in .Renviron? Default: FALSE.

Value

Invisible TRUE if successful.

Examples

```
## Not run:
# Set credentials in .Renviron (will persist across R sessions)
copernicus_set_env_credentials("your_username", "your_password")

## End(Not run)
```

copernicus_setup_credentials

Configure Copernicus Marine credentials

Description

Sets up Copernicus Marine Service credentials using various methods:

1. Function parameters
2. R session options
3. Environment variables
4. Interactive prompt (only in interactive sessions)

Usage

```
copernicus_setup_credentials(
  username = NULL,
  password = NULL,
  store_credentials = TRUE,
  prompt_if_missing = interactive()
)
```

Arguments

username	Character. Copernicus Marine username. If NULL, tries other methods.
password	Character. Copernicus Marine password. If NULL, tries other methods.
store_credentials	Logical. Store credentials in session options? Default: TRUE.
prompt_if_missing	Logical. Prompt user for credentials if not found? Default: TRUE only in interactive sessions.

Value

Invisible list with username and password (password is masked).

Examples

```
## Not run:
# Set credentials directly
copernicus_setup_credentials("username", "password")

# Set credentials and store in options
copernicus_setup_credentials("username", "password", store_credentials = TRUE)

# Try to get from environment/options
copernicus_setup_credentials()

## End(Not run)
```

---

copernicus_test *Test Copernicus integration*

Description

Performs a small test download to validate that the whole system works. Uses stored credentials if available. Downloads to tempdir().

Usage

```
copernicus_test(username = NULL, password = NULL)
```

Arguments

username	Copernicus Marine username (optional). Will try to get from stored credentials first.
password	Copernicus Marine password (optional). Will try to get from stored credentials first.

Value

TRUE if the test was successful.

---

copernicus_test_open *Test opening of Copernicus dataset*

Description

Performs a test dataset opening to validate that the open_dataset function works. Uses stored credentials if available.

Usage

```
copernicus_test_open(username = NULL, password = NULL)
```

Arguments

username	Copernicus Marine username (optional, will try to get from stored credentials first).
password	Copernicus Marine password (optional, will try to get from stored credentials first).

Value

TRUE if the test was successful.

---

copernicus_validate_credentials *Validate Copernicus Marine credentials*

Description

Tests if the stored credentials work by attempting a simple API call.

Usage

```
copernicus_validate_credentials()
```

Value

Logical. TRUE if credentials are valid, FALSE otherwise.

Examples

```
## Not run:
copernicus_validate_credentials()

## End(Not run)
```

`setup_copernicus` *Set up Copernicus Marine integration with credentials*

Description

Sets up the Python environment and loads the copernicusmarine module for use in R. Optionally configures Copernicus Marine credentials for the session. It is recommended to run this once per session before calling other functions in the package. Note: This function does not install Python packages by default for CRAN compliance.

Usage

```
setup_copernicus(
  install_copernicus = FALSE,
  username = NULL,
  password = NULL,
  store_credentials = TRUE
)
```

Arguments

`install_copernicus`	Logical. Should the copernicusmarine package be installed in Python if not available? Default: FALSE (changed for CRAN compliance).
`username`	Character. Copernicus Marine username. If NULL, will try to get from options or environment variables.
`password`	Character. Copernicus Marine password. If NULL, will try to get from options or environment variables.
`store_credentials`	Logical. Should credentials be stored in session options? Default: TRUE.

Value

Invisible TRUE if the configuration was successful.

Examples

```
## Not run:
# Basic setup without credentials (manual Python package installation required)
setup_copernicus()

# Setup with credentials
setup_copernicus(username = "your_username", password = "your_password")

# Setup reading from environment variables
setup_copernicus()  # Will look for COPERNICUS_USERNAME and COPERNICUS_PASSWORD

# Setup and store credentials for session
setup_copernicus(username = "user", password = "pass", store_credentials = TRUE)

## End(Not run)
```

Index

copernicus_clear_credentials, 2
copernicus_download, 2
copernicus_get_credentials, 4
copernicus_is_ready, 4
copernicus_open_dataset, 5
copernicus_set_env_credentials, 6
copernicus_setup_credentials, 6
copernicus_test, 7
copernicus_test_open, 8
copernicus_validate_credentials, 8

setup_copernicus, 9