OSCARS
Open Science Clusters' Action for Research & Society

Funded Project

RSOTC: the Regional State of the Climate

Presenter: Antonio Pérez Velasco, Predictia Intelligent Data Solutions SL, 0000-0002-0250-1461

Implemented by

predictia

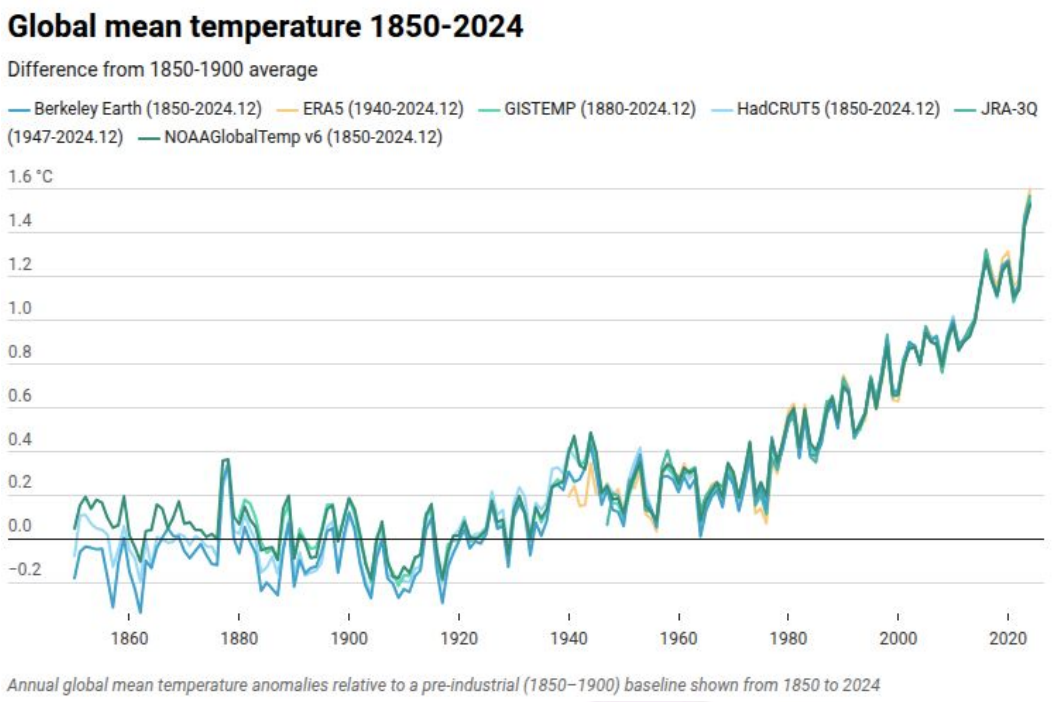
IFCA
Instituto de Física de Cantabria

Funded by the European Union

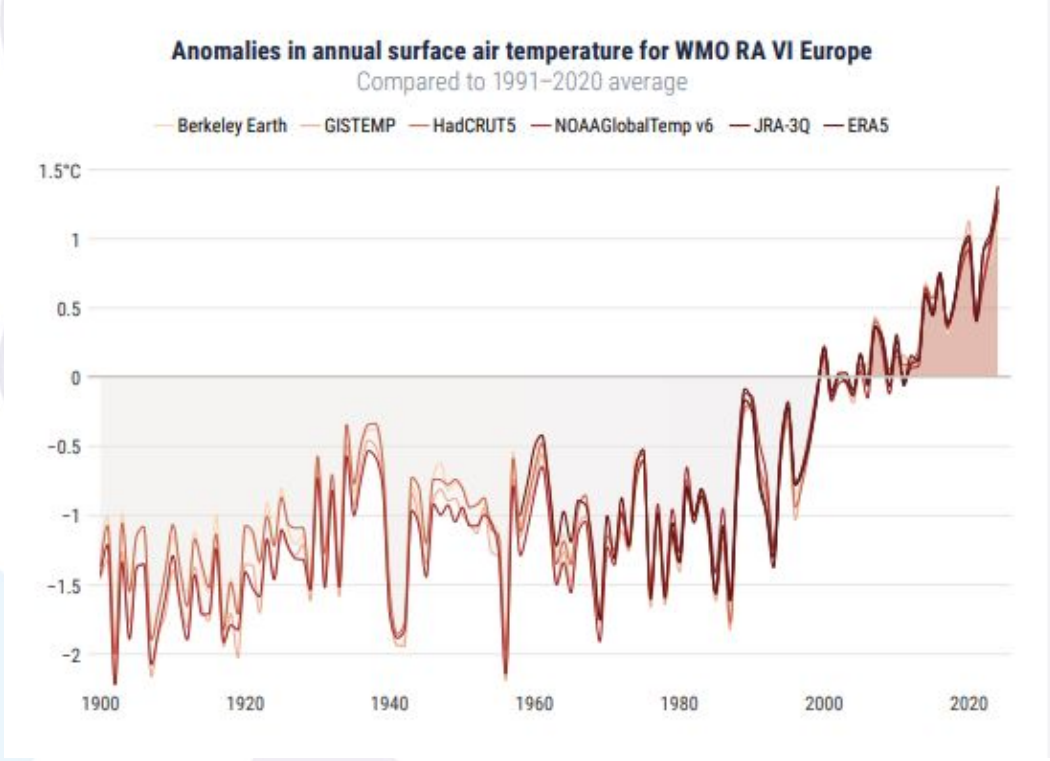
CHALLENGE ADDRESSED

While great, currently available “State of the climate” (SotC) reports **have limitations**.

State of the Global Climate - WMO



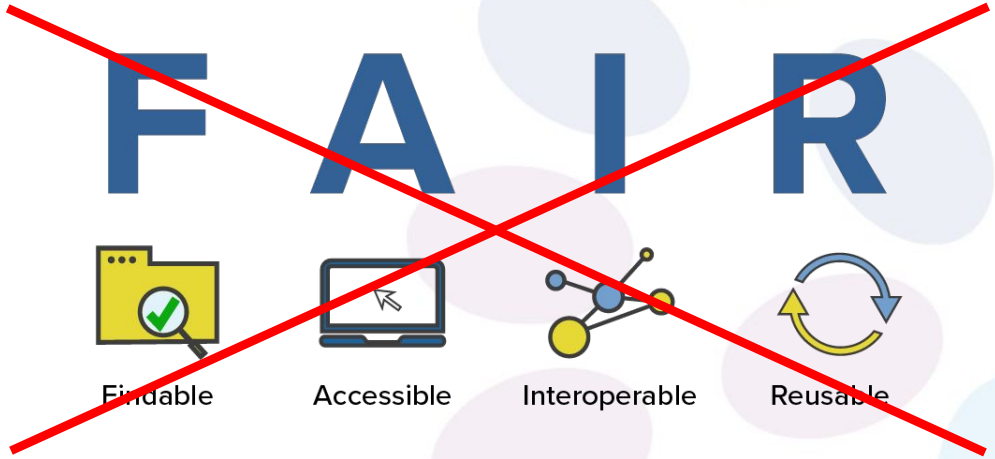
European State of the Climate - Copernicus C3S

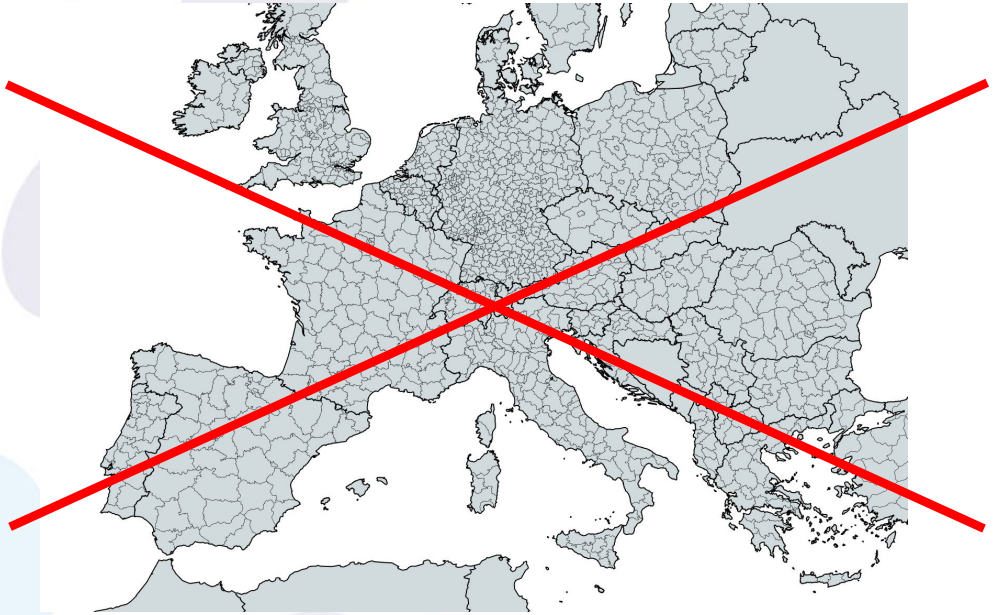


CHALLENGE ADDRESSED

While great, currently available “State of the climate” (SotC) reports **have limitations**.

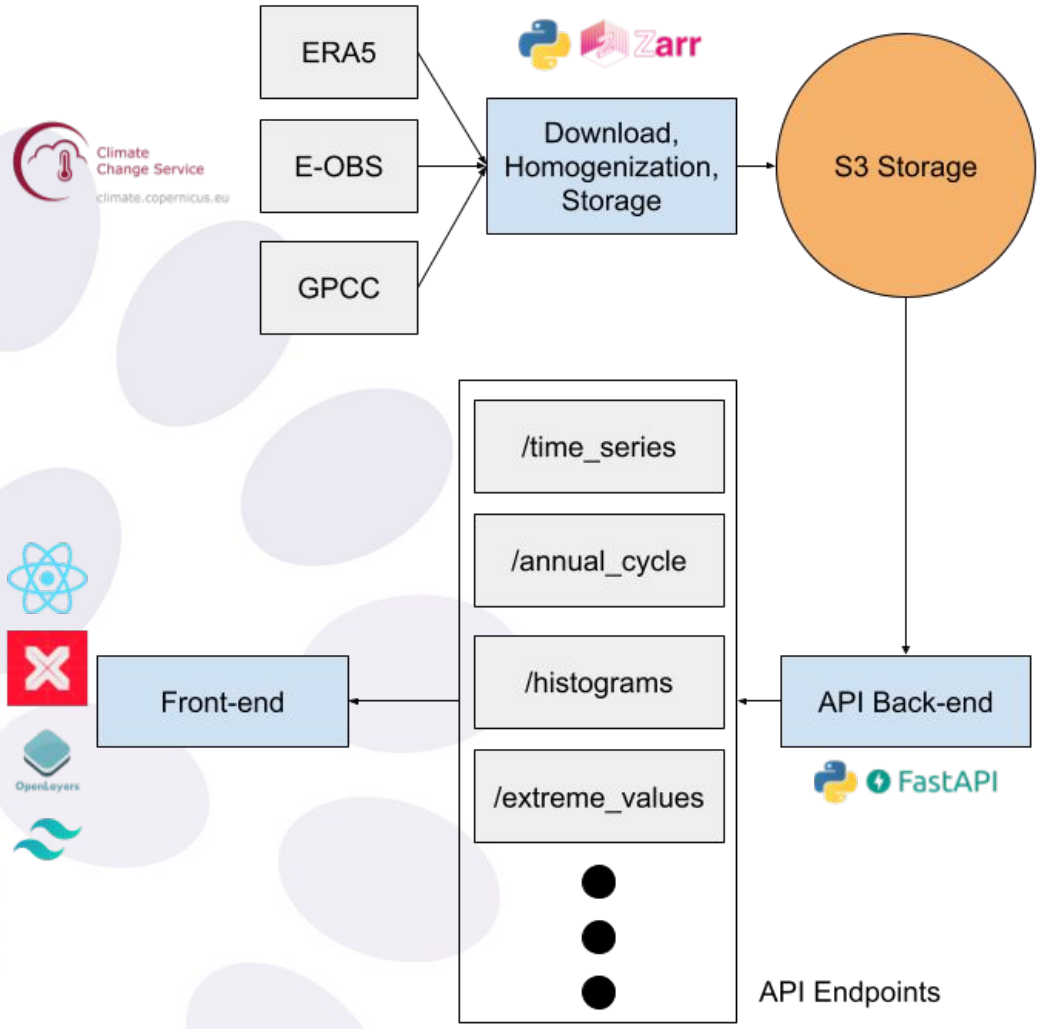
They don’t usually follow the **FAIR principles** and are not available for **small socio-economic regions**.





SOLUTION

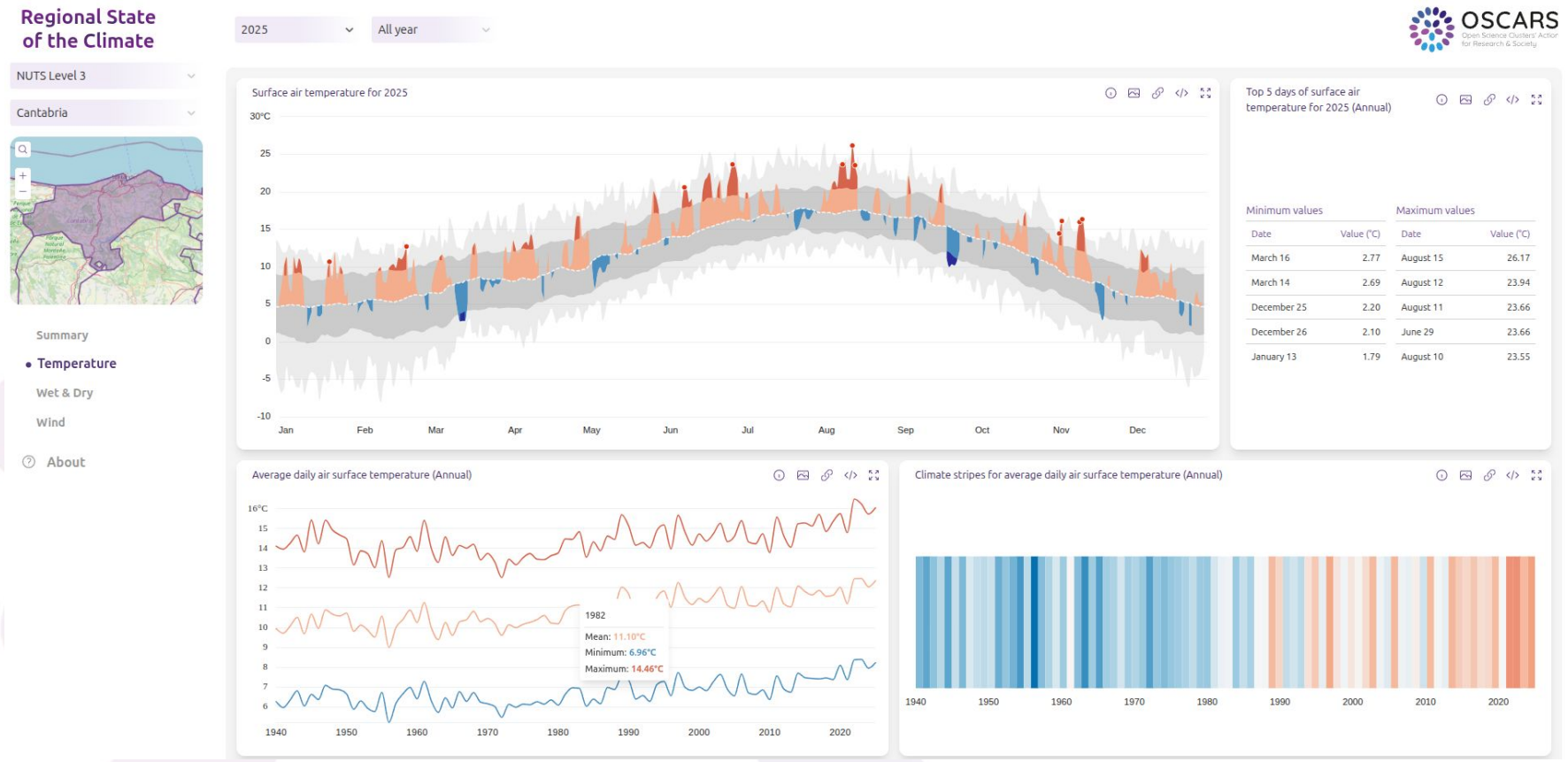
We have developed a **FAIR by design dashboard** that will enable the users to easily visualise a **state of the climate for their regions of interest**. The available regions are the Nomenclature of Territorial Units for Statistics **(NUTS) European regions**.



RESULTS

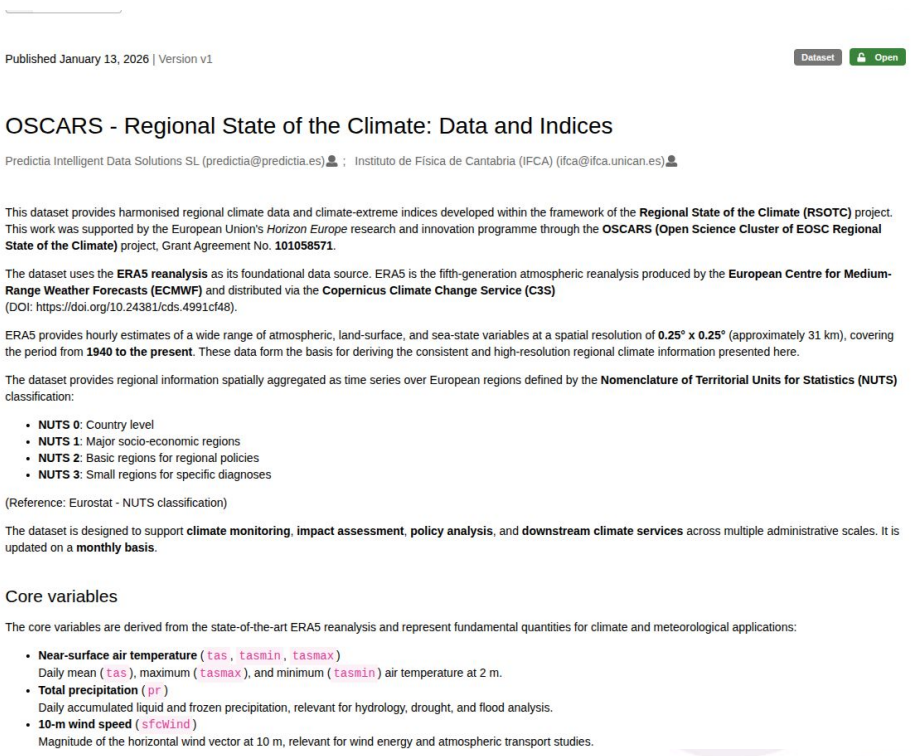
An **user-centric web dashboard** to visualize up-to-date regional climate data

https://rsotc.predictia.es



RESULTS

Publication of the scientific results, including software, data and metadata into **open repos (GitHub) and FAIR registries (Zenodo)**



Published January 13, 2026 | Version v1

Dataset Open

OSCARS - Regional State of the Climate: Data and Indices

Predictia Intelligent Data Solutions SL (predictia@predictia.es) ; Instituto de Física de Cantabria (IFCA) (ifca@ifca.unican.es)

This dataset provides harmonised regional climate data and climate-extreme indices developed within the framework of the **Regional State of the Climate (RSOTC)** project. This work was supported by the European Union's *Horizon Europe* research and innovation programme through the **OSCARS (Open Science Cluster of EOSC Regional State of the Climate)** project, Grant Agreement No. **101058571**.

The dataset uses the **ERA5 reanalysis** as its foundational data source. ERA5 is the fifth-generation atmospheric reanalysis produced by the **European Centre for Medium-Range Weather Forecasts (ECMWF)** and distributed via the **Copernicus Climate Change Service (C3S)** (DOI: https://doi.org/10.24381/cds.4991cf48).

ERA5 provides hourly estimates of a wide range of atmospheric, land-surface, and sea-state variables at a spatial resolution of **0.25° x 0.25°** (approximately 31 km), covering the period from **1940 to the present**. These data form the basis for deriving the consistent and high-resolution regional climate information presented here.

The dataset provides regional information spatially aggregated as time series over European regions defined by the **Nomenclature of Territorial Units for Statistics (NUTS)** classification:

- **NUTS 0**: Country level
- **NUTS 1**: Major socio-economic regions
- **NUTS 2**: Basic regions for regional policies
- **NUTS 3**: Small regions for specific diagnoses

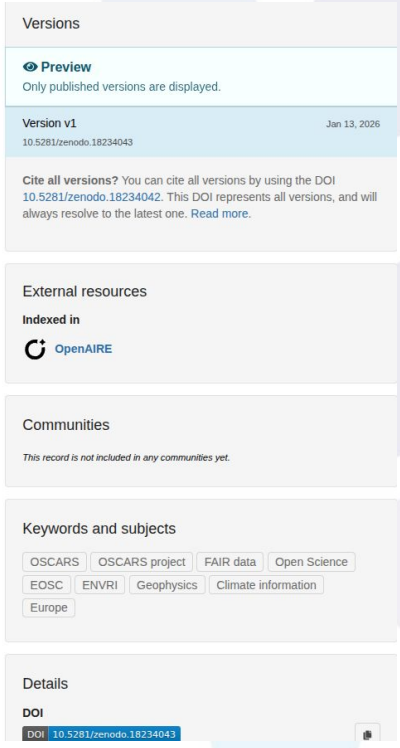
(Reference: Eurostat - NUTS classification)

The dataset is designed to support **climate monitoring**, **impact assessment**, **policy analysis**, and **downstream climate services** across multiple administrative scales. It is updated on a **monthly basis**.

Core variables

The core variables are derived from the state-of-the-art ERA5 reanalysis and represent fundamental quantities for climate and meteorological applications:

- **Near-surface air temperature** (`tas`, `tasmin`, `tasmax`)
  Daily mean (`tas`), maximum (`tasmax`), and minimum (`tasmin`) air temperature at 2 m.
- **Total precipitation** (`pr`)
  Daily accumulated liquid and frozen precipitation, relevant for hydrology, drought, and flood analysis.
- **10-m wind speed** (`sfcWind`)
  Magnitude of the horizontal wind vector at 10 m, relevant for wind energy and atmospheric transport studies.



Versions

Preview
Only published versions are displayed.

Version v1 Jan 13, 2026
10.5281/zenodo.18234043

Cite all versions? You can cite all versions by using the DOI 10.5281/zenodo.18234042. This DOI represents all versions, and will always resolve to the latest one. Read more.

External resources

Indexed in

OpenAIRE

Communities

This record is not included in any communities yet.

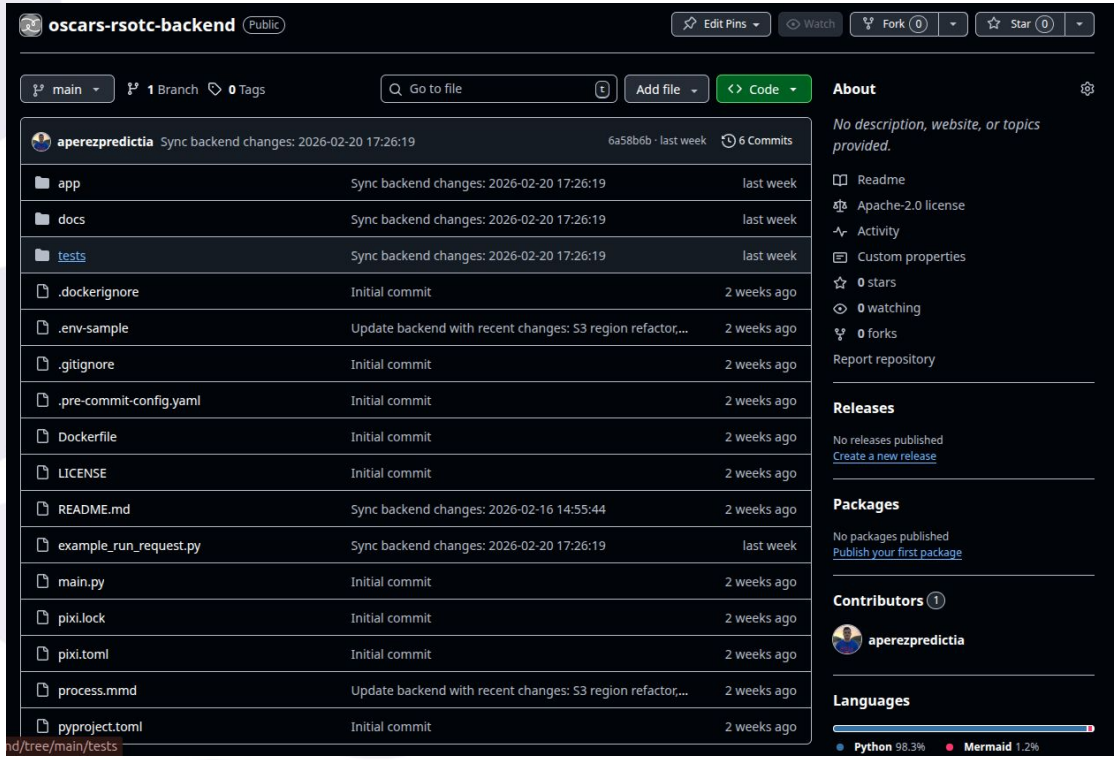
Keywords and subjects

OSCARS | OSCARS project | FAIR data | Open Science | EOSC | ENVRI | Geophysics | Climate information | Europe

Details

DOI

DOI 10.5281/zenodo.18234043



oscars-rsotc-backend Public

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aperezpredictia Sync backend changes: 2026-02-20 17:26:19 6a58b6b · last week 6 Commits

app	Sync backend changes: 2026-02-20 17:26:19	last week
docs	Sync backend changes: 2026-02-20 17:26:19	last week
tests	Sync backend changes: 2026-02-20 17:26:19	last week
.dockerignore	Initial commit	2 weeks ago
.env-sample	Update backend with recent changes: S3 region refactor,...	2 weeks ago
.gitignore	Initial commit	2 weeks ago
.pre-commit-config.yaml	Initial commit	2 weeks ago
Dockerfile	Initial commit	2 weeks ago
LICENSE	Initial commit	2 weeks ago
README.md	Sync backend changes: 2026-02-16 14:55:44	2 weeks ago
example_run_request.py	Sync backend changes: 2026-02-20 17:26:19	last week
main.py	Initial commit	2 weeks ago
pixi.lock	Initial commit	2 weeks ago
pixi.toml	Initial commit	2 weeks ago
process.mmd	Update backend with recent changes: S3 region refactor,...	2 weeks ago
pyproject.toml	Initial commit	2 weeks ago

About

No description, website, or topics provided.

Readme
Apache-2.0 license
Activity
Custom properties
0 stars
0 watching
0 forks
Report repository

Releases

No releases published
Create a new release

Packages

No packages published
Publish your first package

Contributors 1

aperezpredictia

Languages

Python 98.3% Mermaid 1.2%

nd/tree/main/tests

RESULTS

How will make your results sustainable over time?

	Implementation
Open Infrastructure	Hosted on **GitHub** (code) and **Zenodo** (data/DOIs).
Data Continuity	Built on **Copernicus ERA5** for reliable, updated sources.
Interoperable	Fully compatible with **EOSC** standards and onboarding.
Reliability	**RO-Crate** format for automatic, auditable provenance.

How will the scientific community further exploit them?

Pathway	How the Community Benefits
Standardizing	Ready-to-use tools for regional climate monitoring reports.
Integration	**RESTful API** allows direct data pull into 3rd party apps.
Reproducible	Open-source pipelines allow researchers to replicate results.
Scalability	Designed for easy expansion to new regions or variables.

Who has been doing it?

- Daniel San-Martín (Predictia) - Project Coordination - daniel@predictia.es
- Markel García-Díez (Predictia) - Scientific coordination - garciam@predictia.es
- Javier Triana (Predictia) - Dissemination coordination
- Antonio Pérez (Predictia) - Backend development
- Juan José Velasco (Predictia) - Backend development
- Ivan Sánchez (Predictia) - Frontend development
- Álvaro López García (IFCA) - ENVRI and EOSC integration
- Pablo Orviz (IFCA) - Provenance definition

OSCARS
Thank you