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EUROPEAN UNION
Alpine Drought Observatory
European Regional Development Fund

The Alpine Drought Observatory
Web Portal Design and Data Access Strategies

A. Jacob, P.J. Zellner, L. Cattani, T. Iacopino, F. Greifeneder, B. Ventura, D. Quintero, A. Vianello, G. Bertoldi, K. Mayer, G. Seyerl

Network of Drought Observatories in the EU
Kick-Off - 16-17 June, JRC, Ispra, Italy

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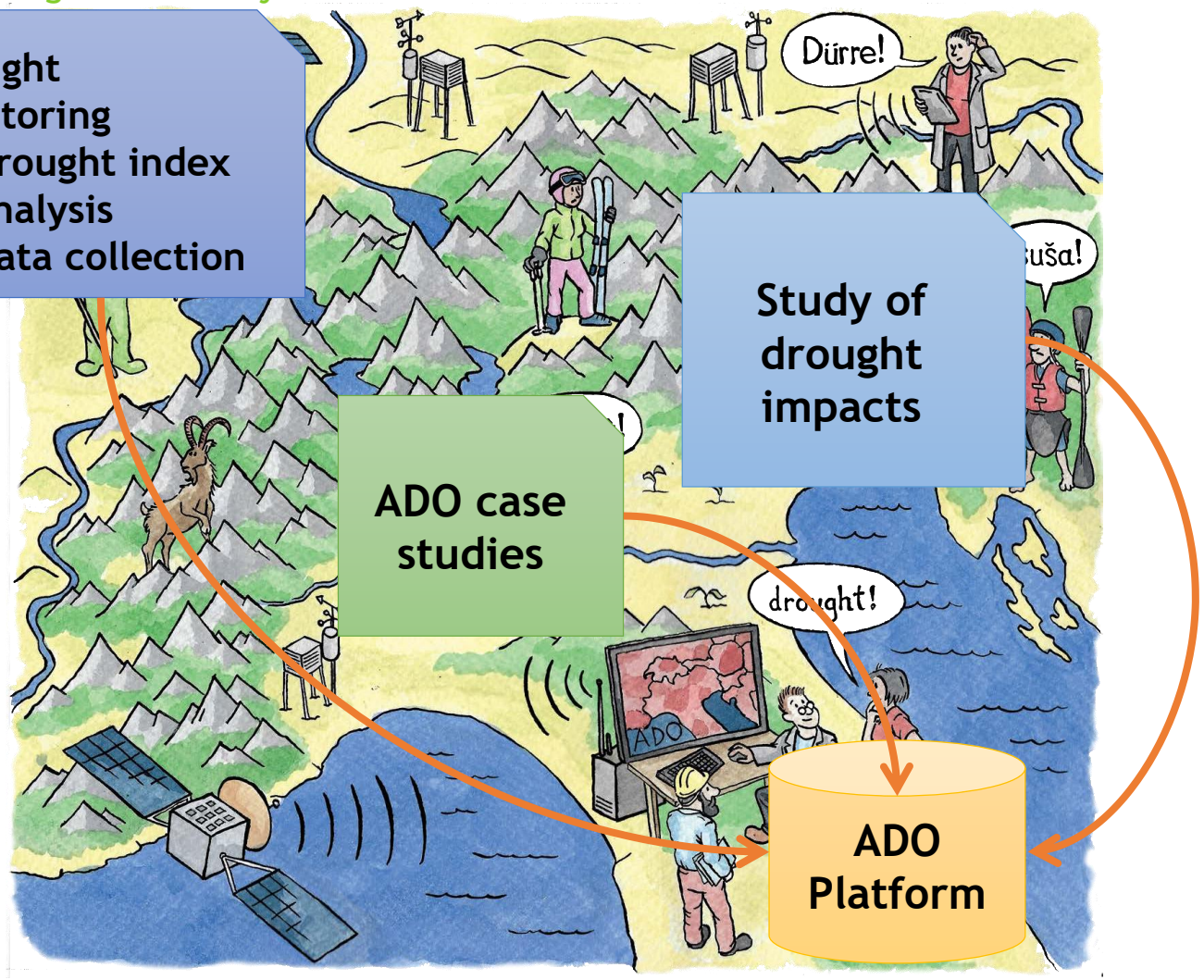

Drought Monitoring
- Drought index analysis
- Data collection

Study of drought impacts

ADO case studies

ADO Platform

Project outputs

- Alpine-wide mapping of meteorological, hydrological and agricultural drought
- Knowledge about the impact of drought
- Methods for assessing drought risk and economic impacts
- ADO web-site
- Recommendations and guidelines for improved drought management

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The Alpine Drought Observatory

The project consortium

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Duration

Start: Oct. 2019
End: Sept. 2022

Funding

Interreg Alpine Space

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Alpine Drought Observatory

About Eurac

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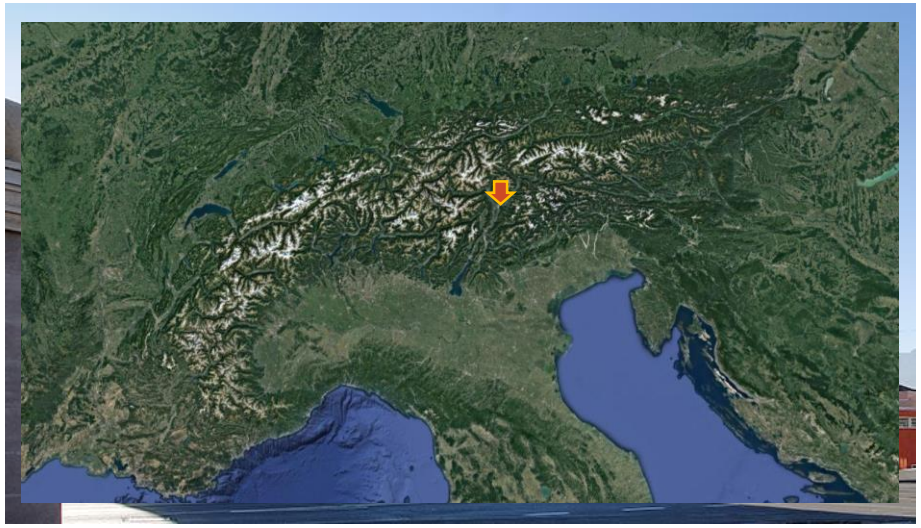


- Private non-profit research institution
- Founded 1992
- Ca. 600 employees
- 11 research institutes and 5 research centres

Overview

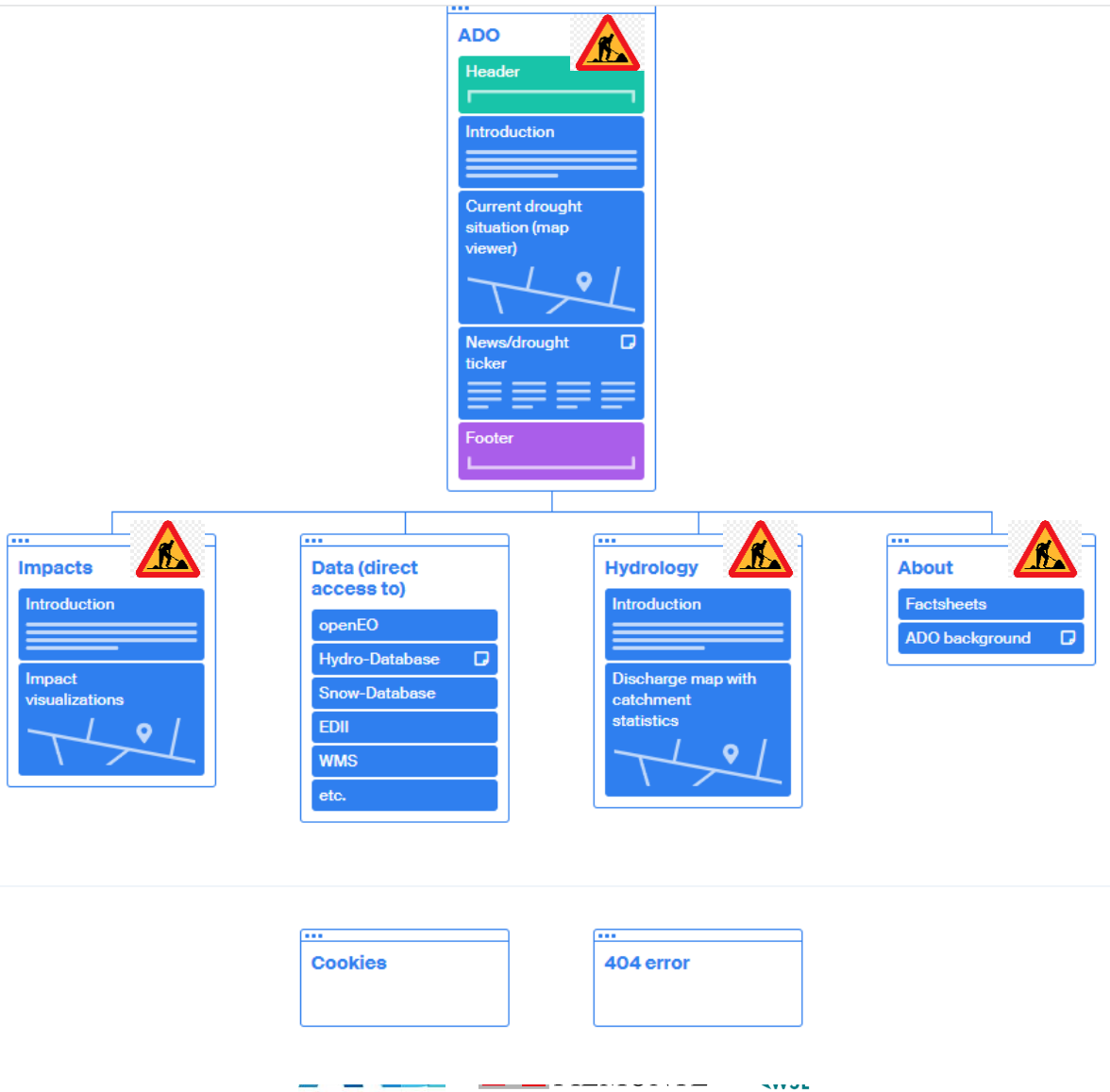
Institutes	Research Support	Centers
Institute for Alpine Environment	Communication	Center for Advanced Studies
Institute for Applied Linguistics	Controlling & Accountancy	Center for Autonomy Experience
Institute for Biomedicine	Education & Training	Center for Global Mountain Safeguard Research
Institute for Comparative Federalism	Facility Management	Center for Sensing Solutions
Institute for Earth Observation	Human Resources	terraXcube
Institute for Minority Rights	Information Technologies	
Institute of Mountain Emergency Medicine	Legal Office	
Institute for Mummy Studies	Library	
Institute for Public Management	Meeting Management	
Institute for Regional Development	Research Development Office	
Institute for Renewable Energy		

Representing Offices:
- Rome
- Vienna

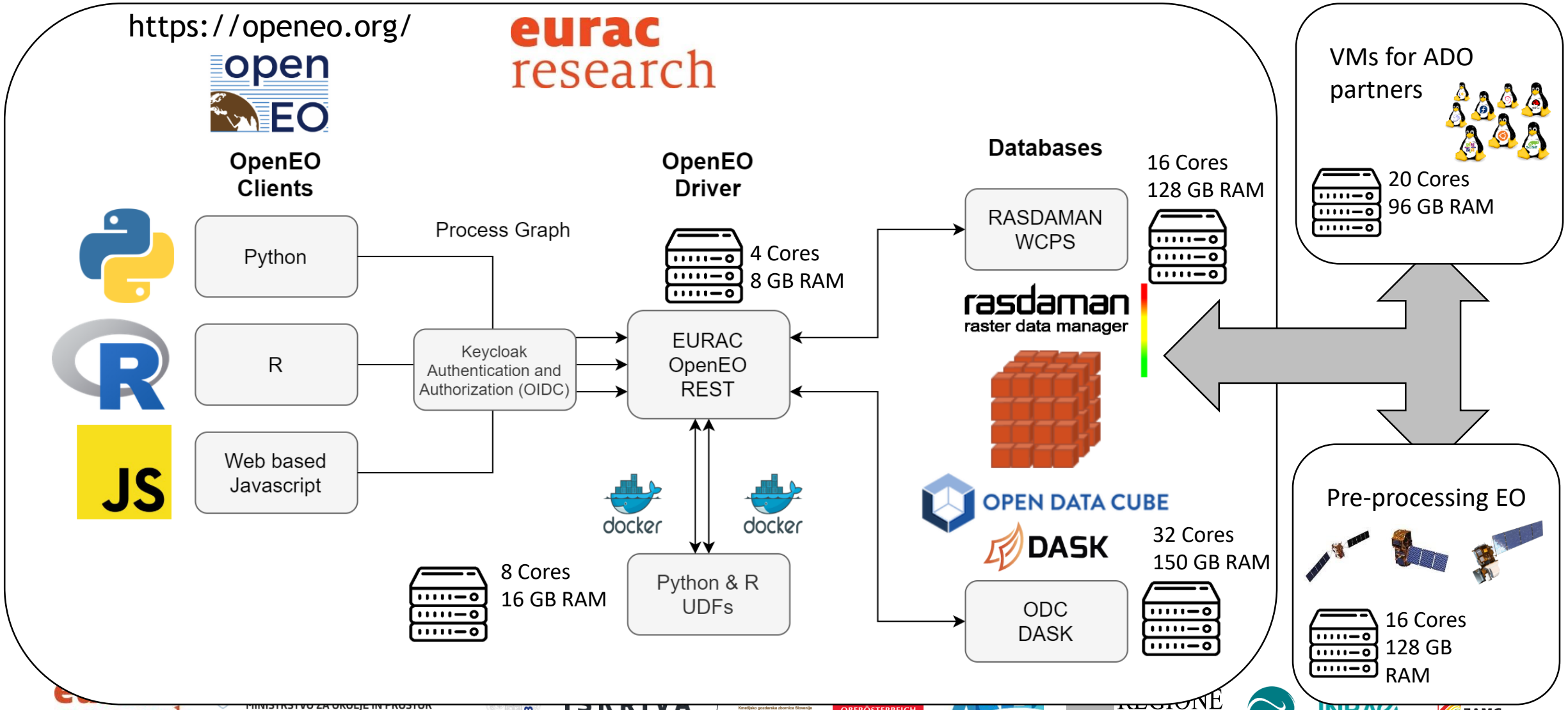
http://www.eurac.edu

Design Phase

Title	Description
Local/regional public authorities in the field of agriculture, water, and meteorology	Fabio Rossi is a member of t assessment of the drought helps him to interpret the l
Policy Maker, e.g. Alpine Convention, EUSALP	Sebastian Wagner is emplo published at the ADO webs management decisions for
Scientist	Camille Bernard is a researc wine harvest of the followi for her study.
PhD, Expert in drought risk	Ramona Muhr is a PhD stud hazard and impact data to d
Advisor for agriculture	Lara Schmidt is an advisor fo on the current drought. In o
Private person impacted by drought	Karl Mueller is currently im more about the current dro the possibility to search for
Forester in an Alpine area	Lina Rahm is a forest manag get more information the e
Journalist for environmental topics	Peter F. is a Journalist for e website to gather informati more frequent and extreme
Content manager	
Official at Administration for Civil Protection and Disaster Relief	Ana V. is an official at ACPD platform to prepare an over of the conditions over a reg

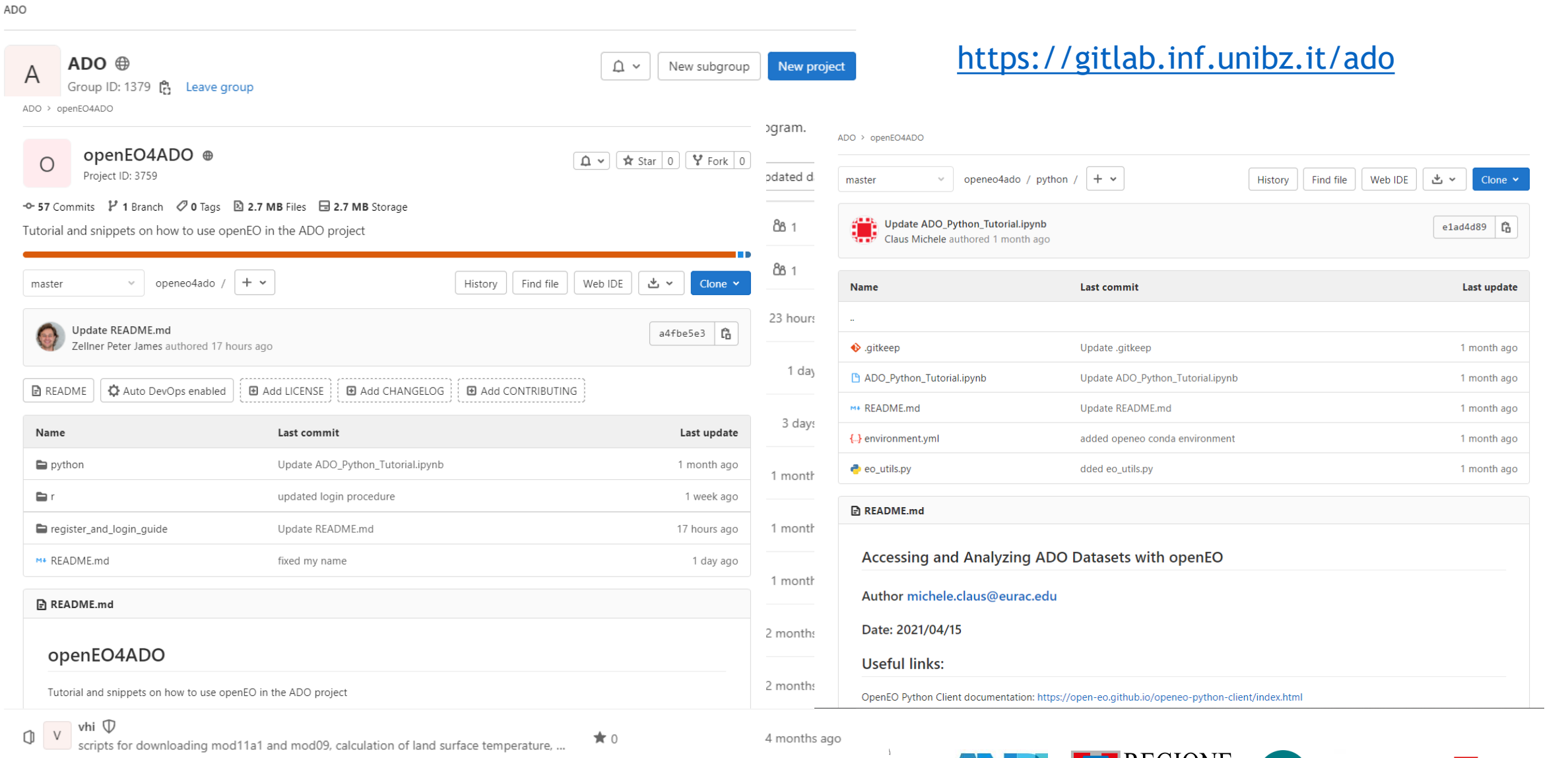


Infrastructure



ADO on git

https://gitlab.inf.unibz.it/ado



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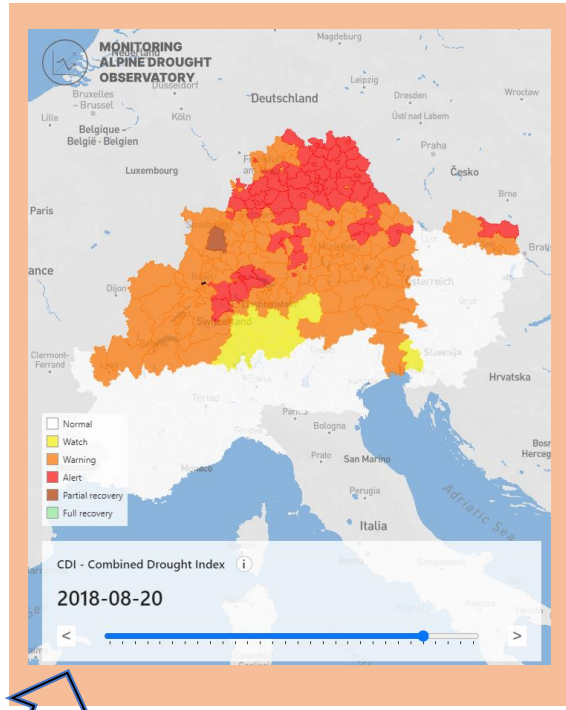
ADO pipelines

- Codes producing Data
- Environment Files
- Documentation
- (Docker Image)

GitLab

- Docker
- CI/CD
- Kubernetes
- Triggering



Development of Code

Changes are directly integrated to pipeline

Modules of the pipelines can be **triggered** by different events

Results are directly integrated into **web-portal**

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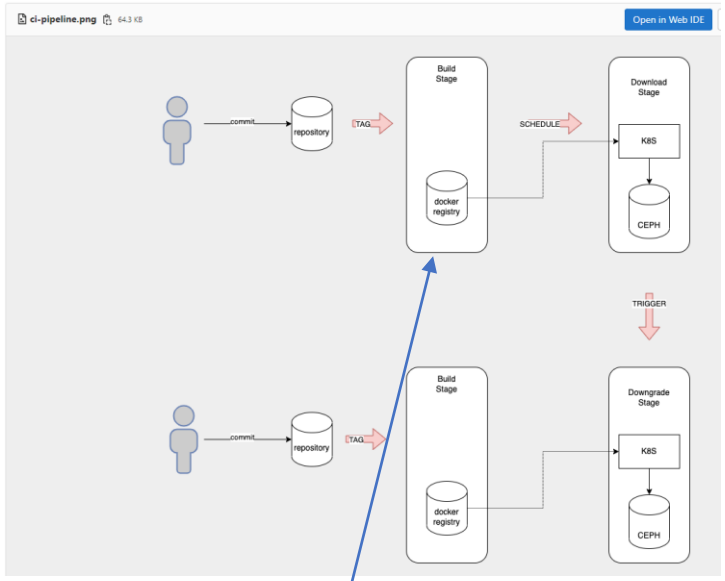
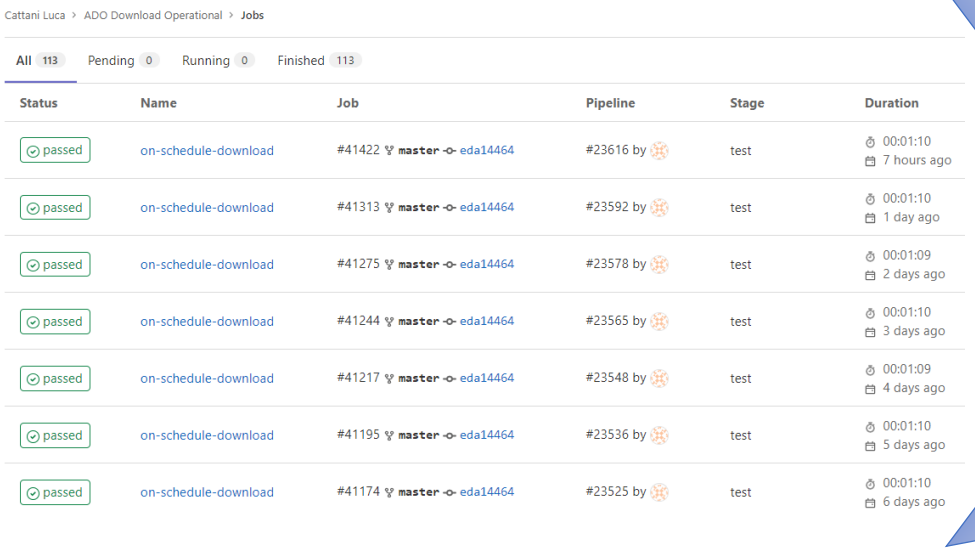
Pipeline Operations

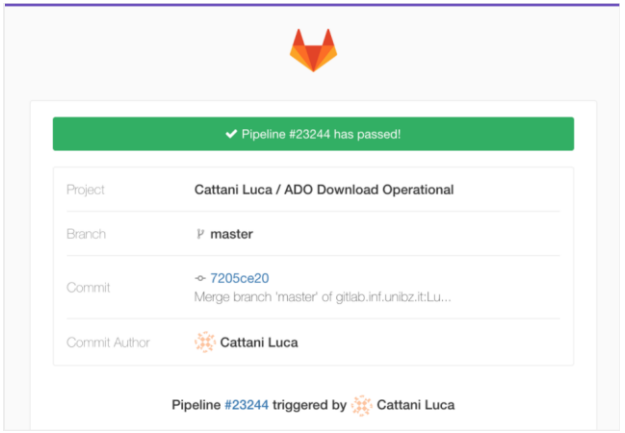
Pipeline



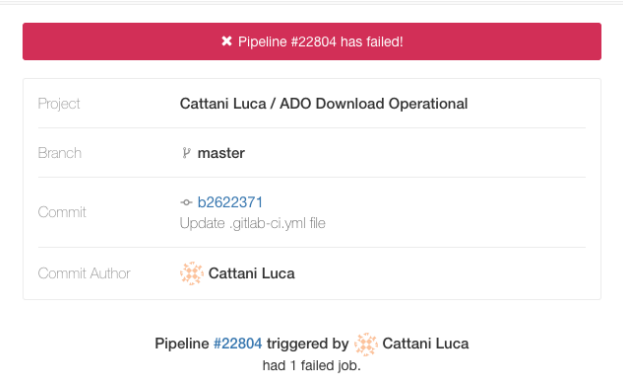
Jobs



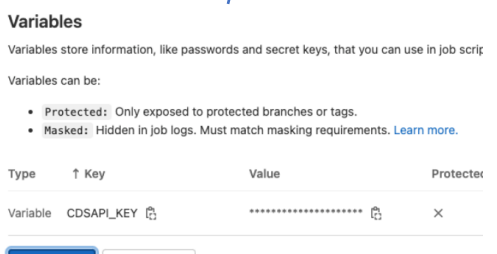
Success Mail



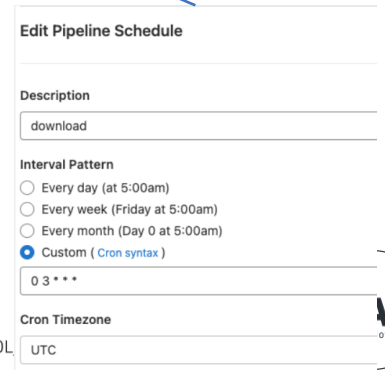
Error Mail



API Key etc.



Schedule



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Current List of Production Indices

ATMOSPHERE

TOP-SOIL

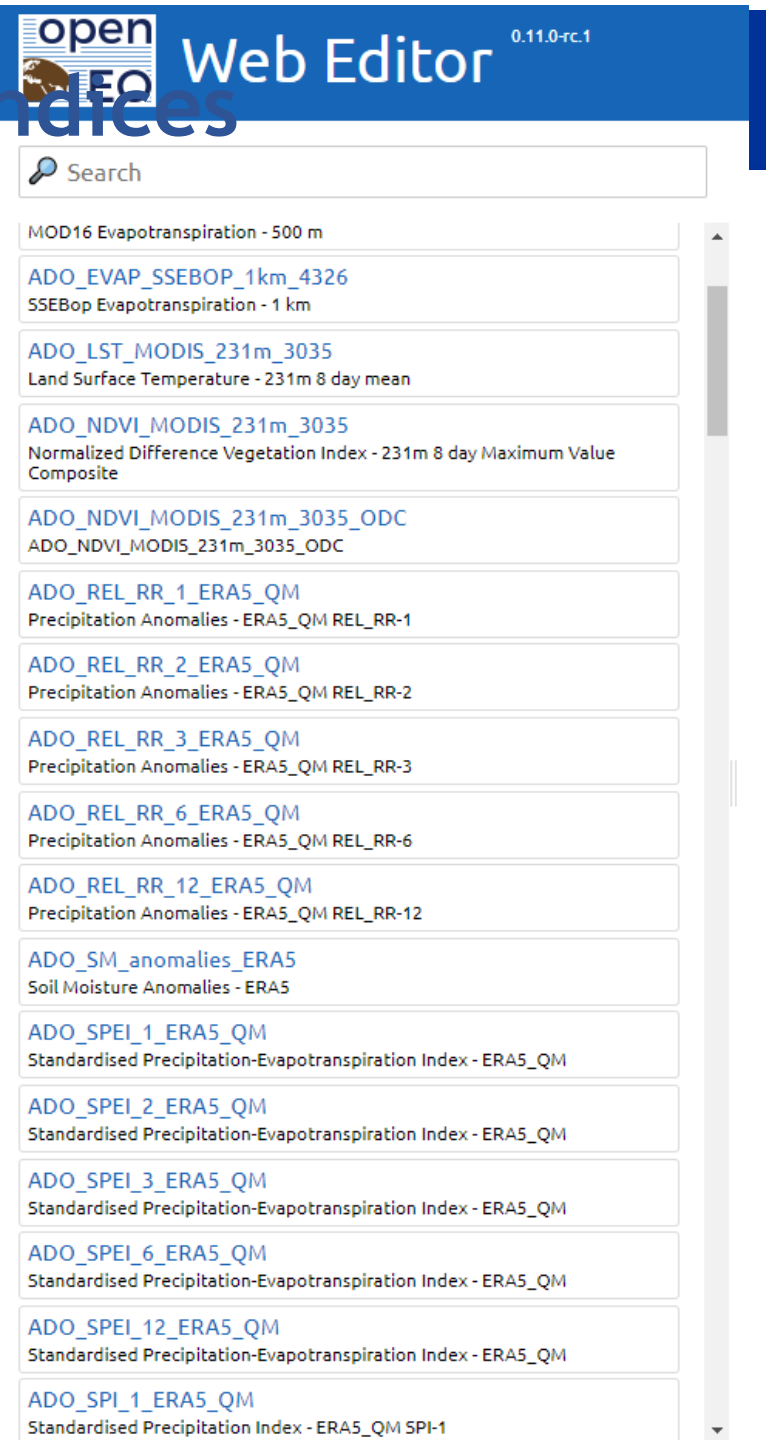
VEGETATION HEALTH

SURFACE WATER
GROUNDWATER

1. Precipitation Anomalies (%)
2. Standardised Precipitation I
3. Standardised Precipitation-Evapotranspiration In
4. Soil Moisture Anomalies
5. Normalized Difference Vege
6. Vegetation Health Index (VH
7. Standardised Snowpack Ind
8. Hydrological Indices (SDI, SG

+ combined drought index - CC

+ integration of impacts



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Current List of Production Indices

rasdaman
raster data manager

OGC Web Coverage Service (WCS) | OGC Web Map Service (WMS) | Admin

GetCapabilities | DescribeCoverage | GetCoverage | ProcessCoverages | DeleteCoverage | InsertCoverage

WCS service endpoint: http://saocompute.eurac.edu/rasdaman/ows **Get Capabilities**

119 coverages available, total volume 8.94 TB

Coverage ID	Coverage subtype	Coverage size	Display footprints
ADO			
ADO_SM_anomalies_ERA5_QM	RectifiedGridCoverage	16.1 GB	☐
ADO_SPEI_12_ERA5_QM	ReferenceableGridCoverage	1.97 GB	☐
ADO_SPEI_1_ERA5_QM	ReferenceableGridCoverage	1.97 GB	☐
ADO_SPEI_2_ERA5_QM	ReferenceableGridCoverage	1.97 GB	☐
ADO_SPEI_3_ERA5_QM	ReferenceableGridCoverage	1.97 GB	☐
ADO_SPEI_6_ERA5_QM	ReferenceableGridCoverage	1.97 GB	☐
ADO_SPI_12_ERA5_QM	ReferenceableGridCoverage	1.97 GB	☐
ADO_SPI_1_ERA5_QM	ReferenceableGridCoverage	1.97 GB	☐
ADO_SPI_2_ERA5_QM	ReferenceableGridCoverage	1.97 GB	☐
ADO_SPI_3_ERA5_QM	ReferenceableGridCoverage	1.97 GB	☐

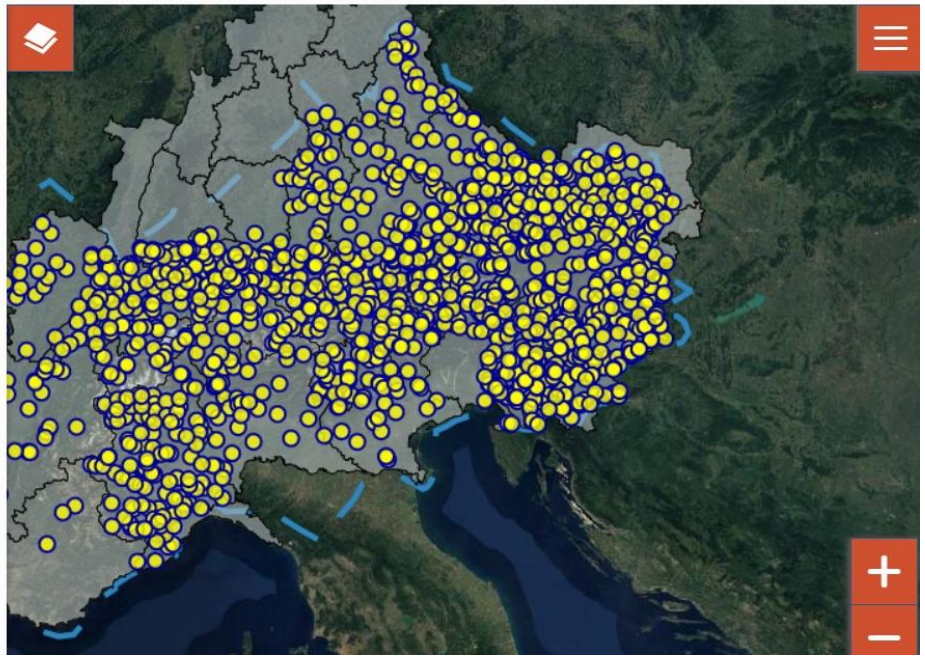
First | Previous | 1 | 2 | 3 | Next | Last

http://saocompute.eurac.edu/rasdaman/ows#/services

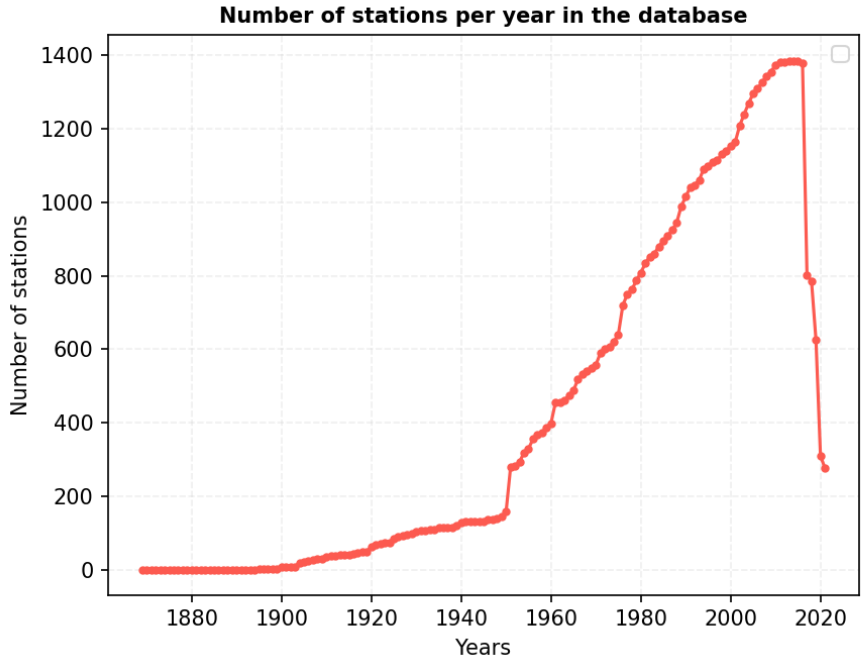
Hydrological Data

Alpine-wide dataset: discharge, water level, groundwater level, metadata
Problems: **different data providers**, real time data availability

https://edp-portal.eurac.edu/cdb_doc/ado/



Country	Runoff stations
Austria	567
Italy	242
Switzerland	235
Slovenia	185
Germany	129
France	65
TOTAL	1423



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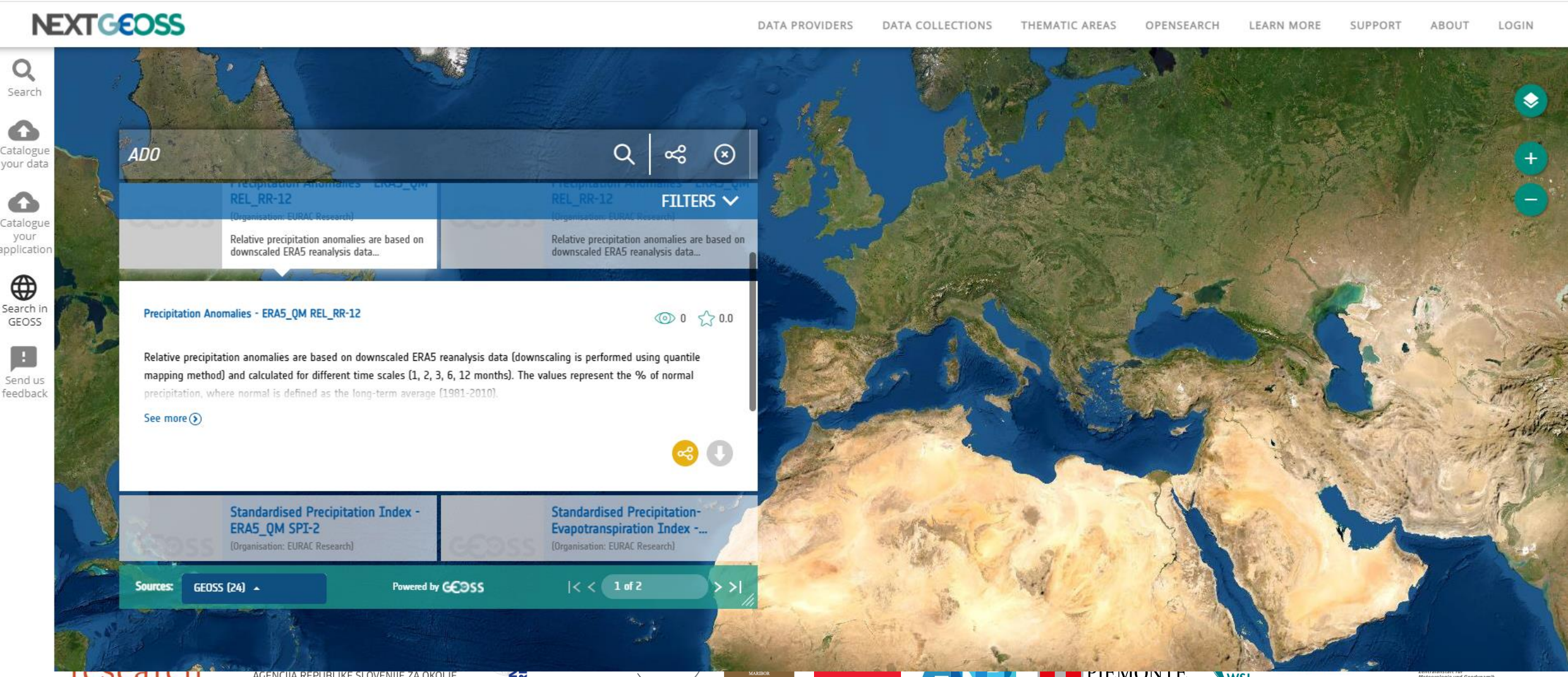
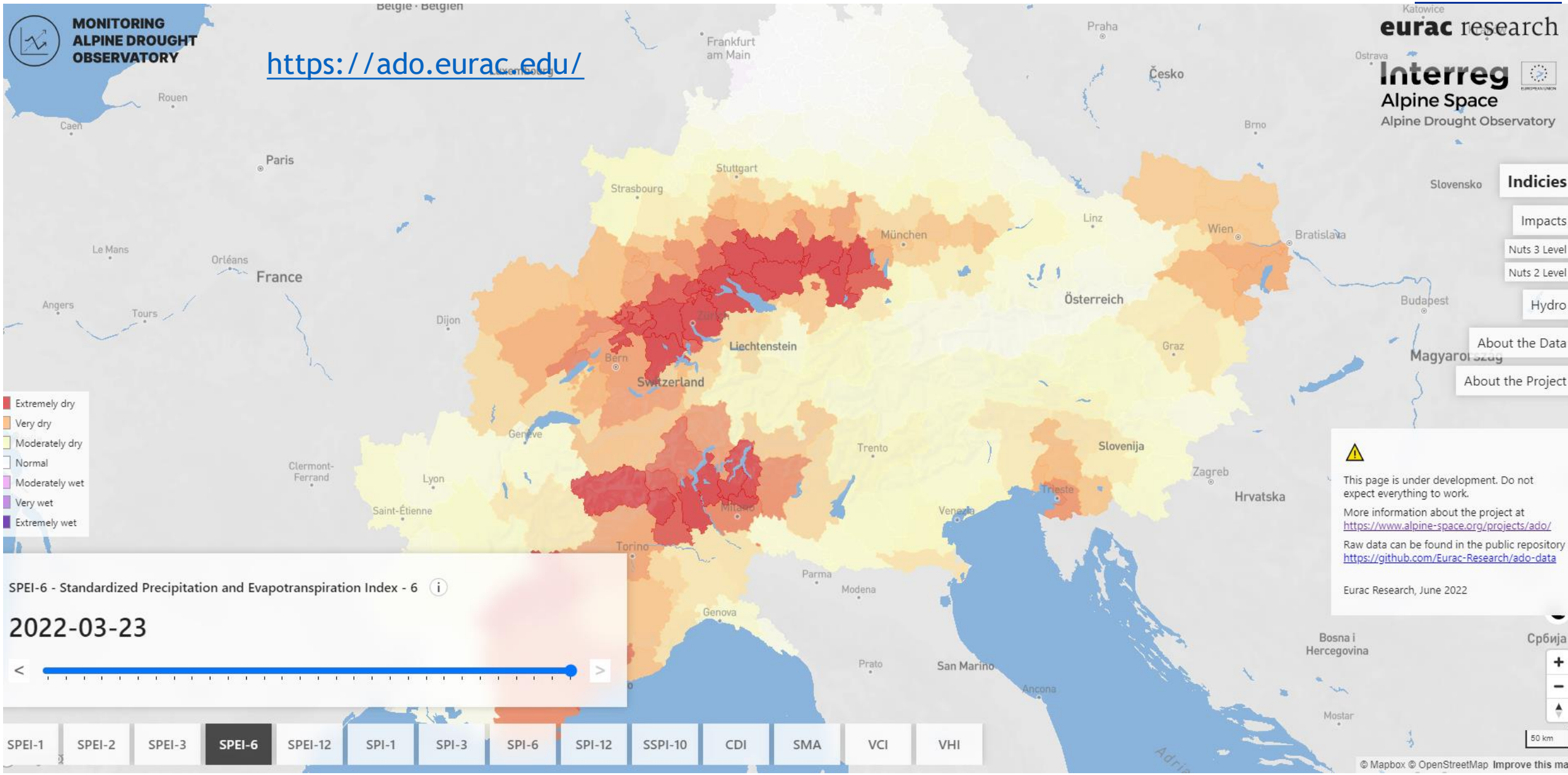
Meta Data

https://edp-portal.eurac.edu/geonetwork/





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MONITORING
ALPINE DROUGHT
OBSERVATORY

https://ado.eurac.edu/

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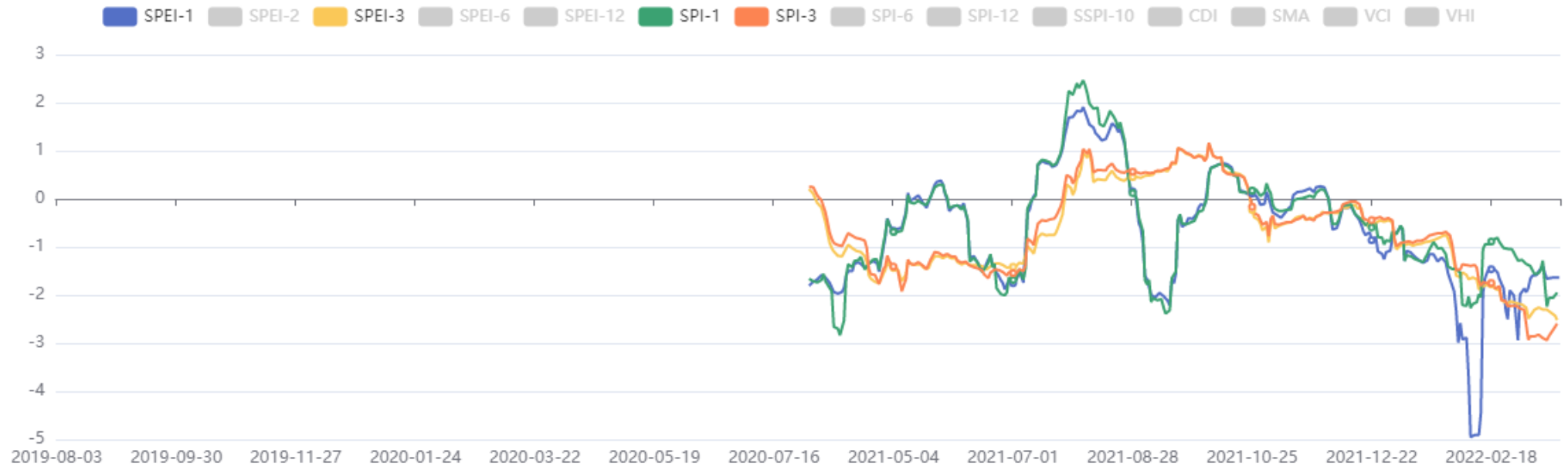
close X

SPEI-1 - Standardized Precipitation and Evapotranspiration Index - 1
Varese (nuts id: ITC41)



Indicies
Impacts
Nuts 3 Level
Nuts 2 Level
Hydro
About the Data
About the Project

Extremely dry
Very dry
Moderately dry
Normal
Moderately wet
Very wet
Extremely wet

under development. Do not
ything to work.
nation about the project at
.alpine-space.org/projects/ado/
n be found in the public repository
ub.com/Eurac-Research/ado-data
rch, June 2022

Србија
50 km
© OpenStreetMap Improve this map

SPEI-6 - Standar
2022-03
SPEI-1
SPEI

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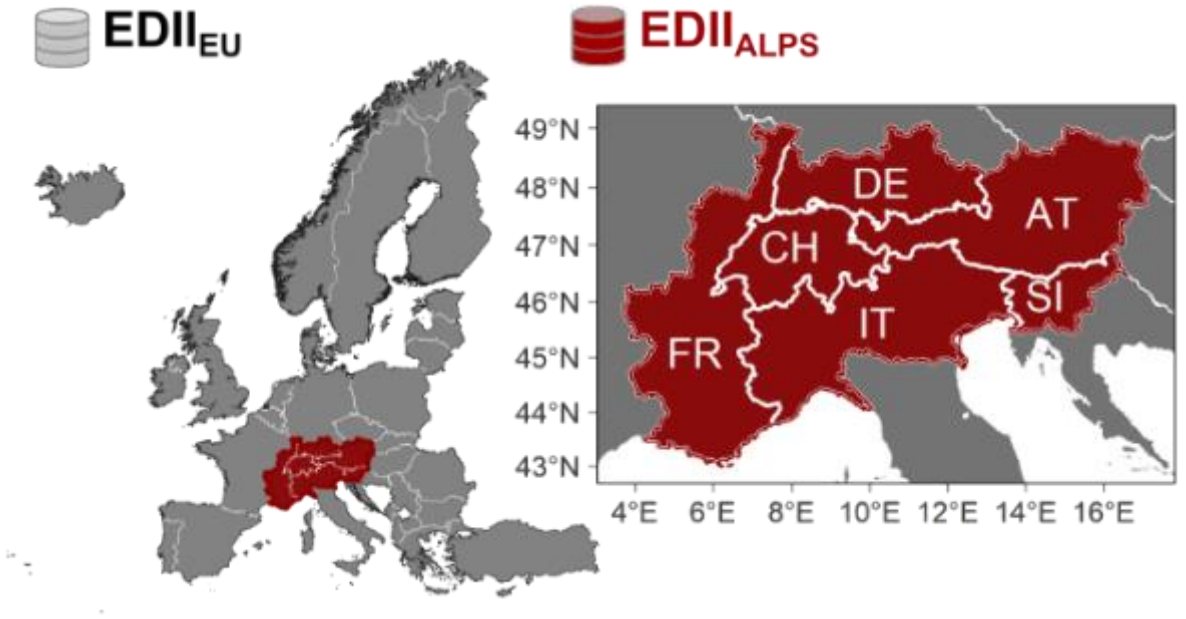
Drought Impacts

- Substantial update of EDII database
  - Various German and Italian text-reports
  - Unwetterchronik ZAMG
  - Drought.ch
  - DMCSEE
  - Propluvia.fr

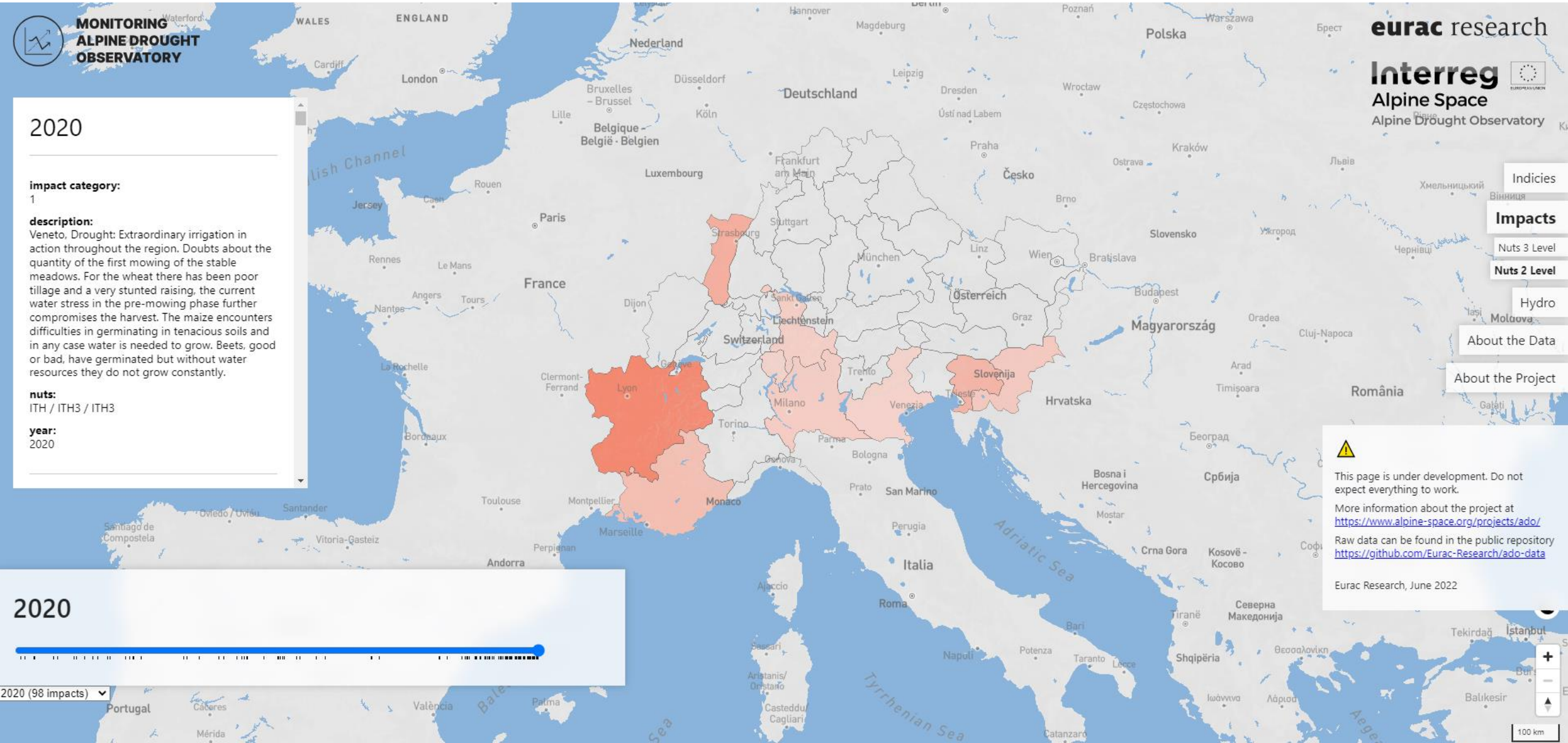
- Filtered to the Alpine Space

→ First version of $EDII_{ALPS}$ allows various analyses

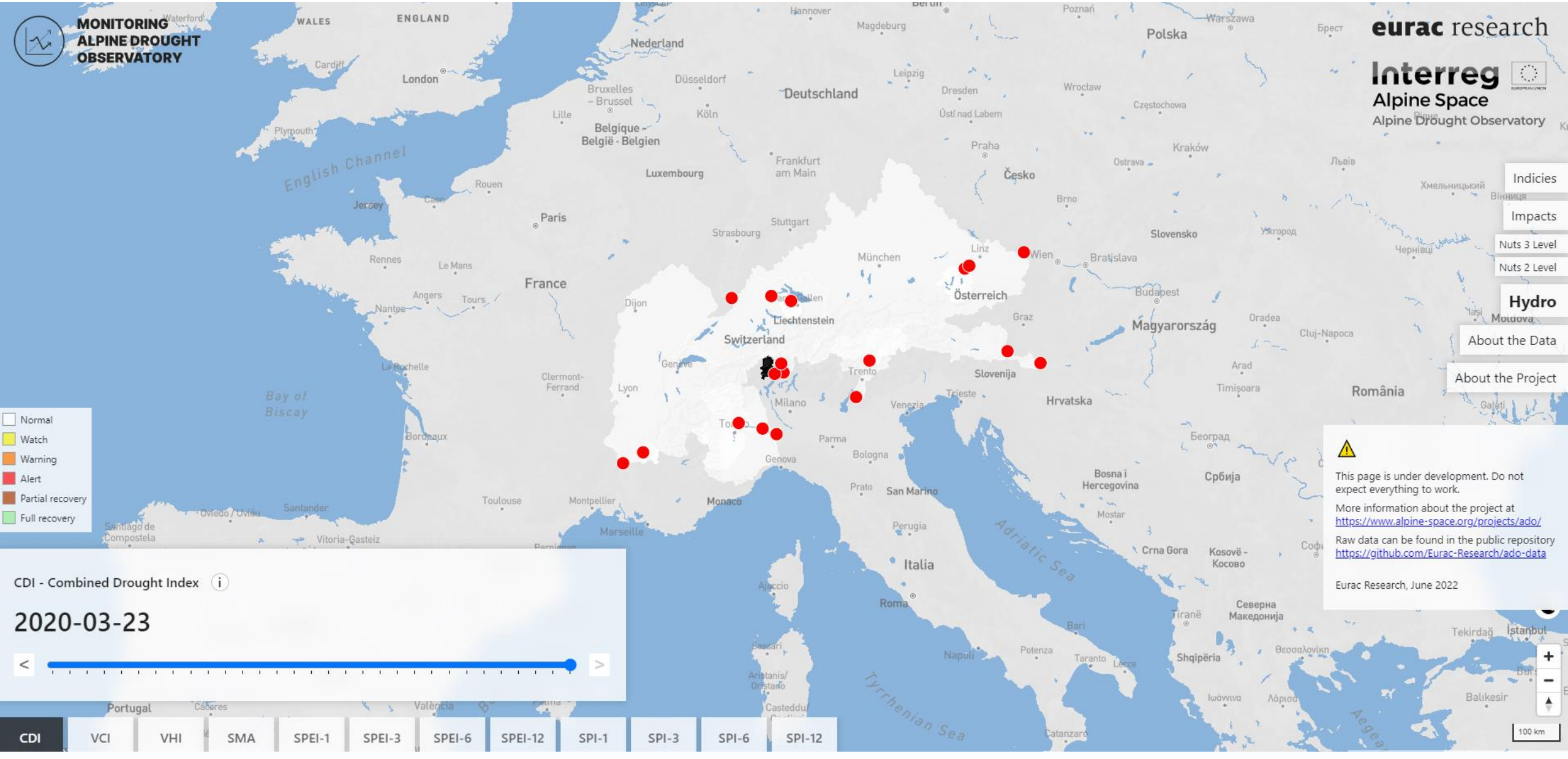


Stephan, R. *et al*. An inventory of Alpine drought impact reports to explore past droughts in a mountain region. *Nat Hazard Earth Sys* **21**, 2485–2501 (2021). https://nhess.copernicus.org/articles/21/2485/2021/

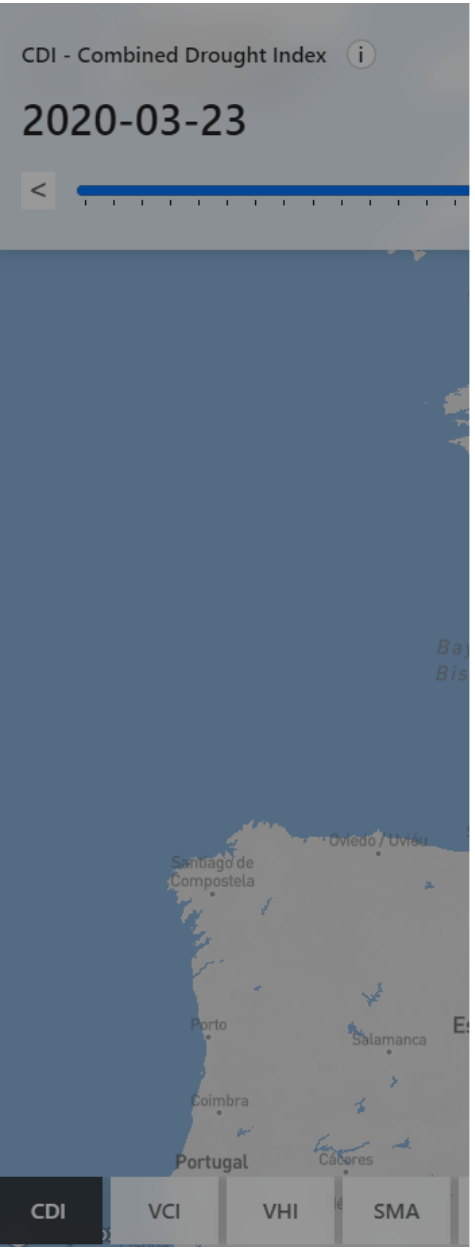
Drought Impacts on the Portal



Hydrology on the Portal



Hydrology on the Portal



Quality check

Quality check and statistics for hydrological station from the ADO project database

Summary of Station **ADO_DSC_ITC1_0037** in **Italy** in the region **Piemonte** in **Isola S. Antonio Po** with coordinates latitude: **45.036153** and longitude: **8.821928**

Metadata information

Description of the dataset

country	region	location_site	lat	lon	start_date	end_date	wat
Italy	Piemonte	Isola S. Antonio Po	45.036153	8.821928	1996-01-02 00:00:00	2019-12-31 00:00:00	Po

Primary statistics

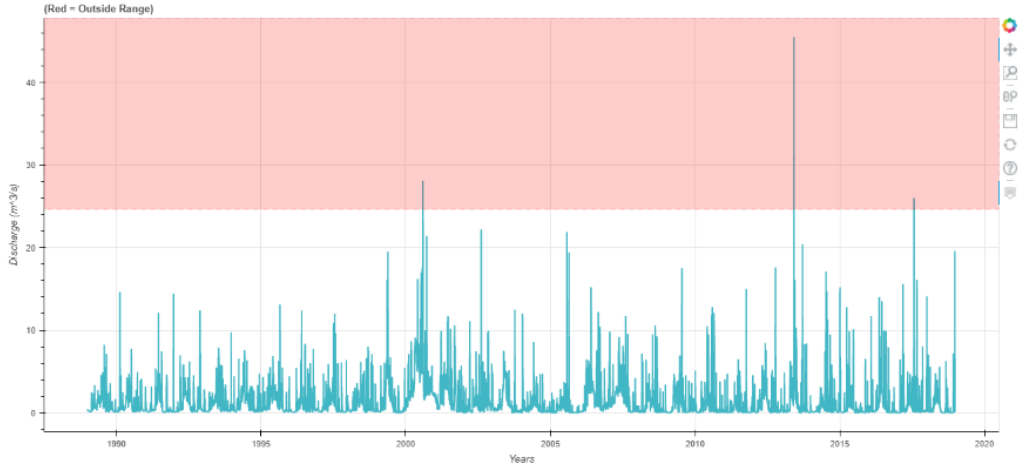
Statistic description of the dataset

	ADO_DSC_ITC1_0037
count	8322.000000
mean	441.090795
std	511.930453
min	30.200000
25%	202.000000
50%	294.000000
75%	495.000000
max	9780.000000

Missing values

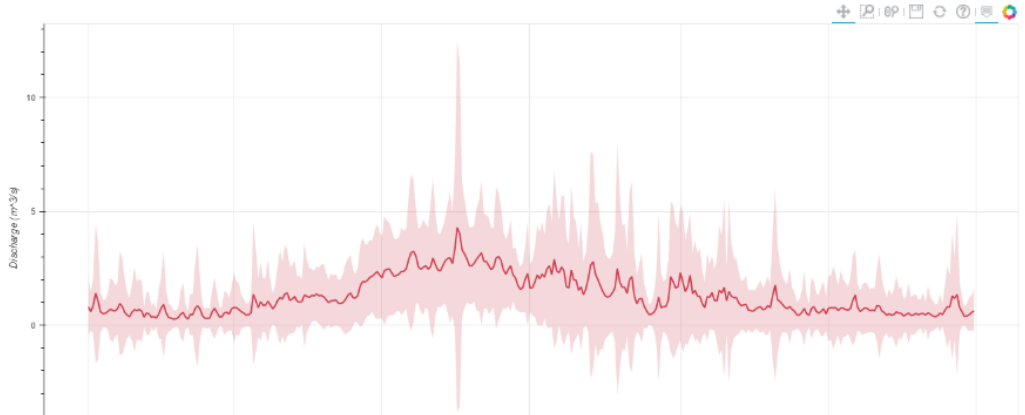
Discharge time series

Station ADO_DSC_CH05_0191 in Trento



Mean annual cycle

Station ADO_DSC_CH05_0191



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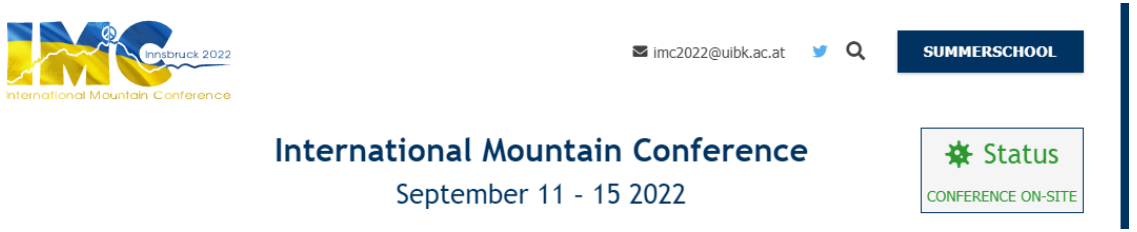
Conclusion & Outlook

Project outputs
Alpine-wide mapping of meteorological, hydrological and agricultural drought
Knowledge about the impact of drought
Methods for assessing drought risk and economic impacts
ADO web-site
Recommendations and guidelines for improved drought management

- Web and Data Portal following FAIR data principles
- Combining data from all relevant sources
- Catering to the needs of different target user groups
- Portal aiming to be fully operational within the next month.

https://www.imc2022.info/



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Thank you for your kind attention!

alexander.jacob@eurac.edu

http://ado.eurac.edu

https://gitlab.inf.unibz.it/ado

https://www.alpine-space.eu/projects/ado/en/home