

The Alpine Drought Observatory Web Portal Design and Data Access Strategies

MENU | CERCA

la Repubblica

ABBONATI | GEDI SMILE | R

CONTENUTO PER GLI ABBONATI

f t in e o p

Siccità: il Po mai così in secca da 70 anni

La grande siccità: campi bruciati e autobotti per rifornire i Comuni. E il Po si riempie di sale

di Elena Dusi

0:29 / 0:29

Al Nord le precipitazioni scarseggiano da dicembre. Il grande fiume è al di sotto del suo minimo storico. L'idea è di alimentarlo con l'acqua del Garda, ma i comuni del lago si oppongono. Si potrebbe arrivare alla nomina di un Commissario per risolvere la crisi più grave degli ultimi 70 anni

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

The Alpine Drought Observatory



Drought Monitoring

- Drought index analysis
- Data collection

Study of drought impacts

ADO case studies

ADO Platform

Project outputs

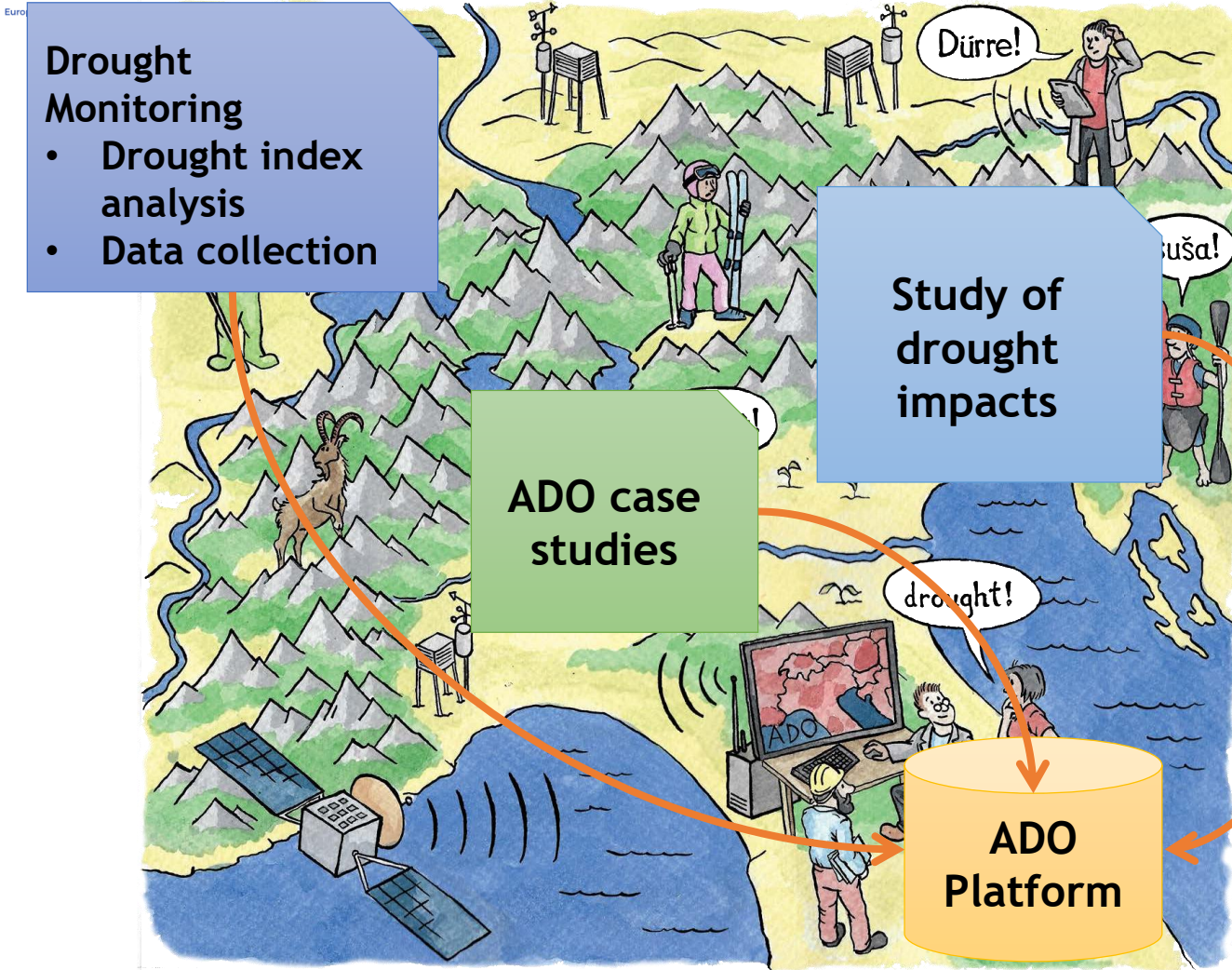
Alpine-wide mapping of meteorological, hydrological and agricultural drought

Knowledge about the impact of drought

Methods for assessing drought risk and economic impacts

ADO web-site

Recommendations and guidelines for improved drought management



The Alpine Drought Observatory



The project consortium



Duration

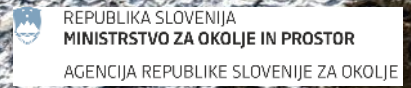


Funding

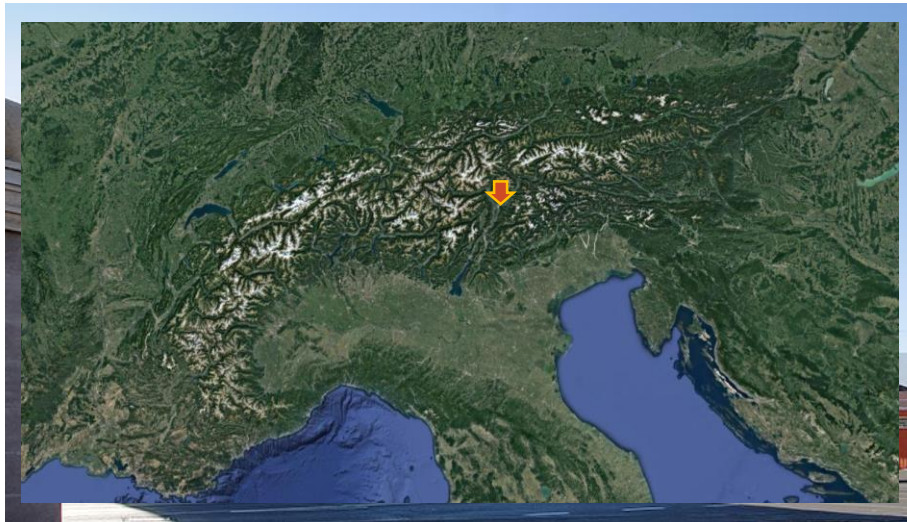


Start: Oct. 2019
End: Sept. 2022

Interreg Alpine Space



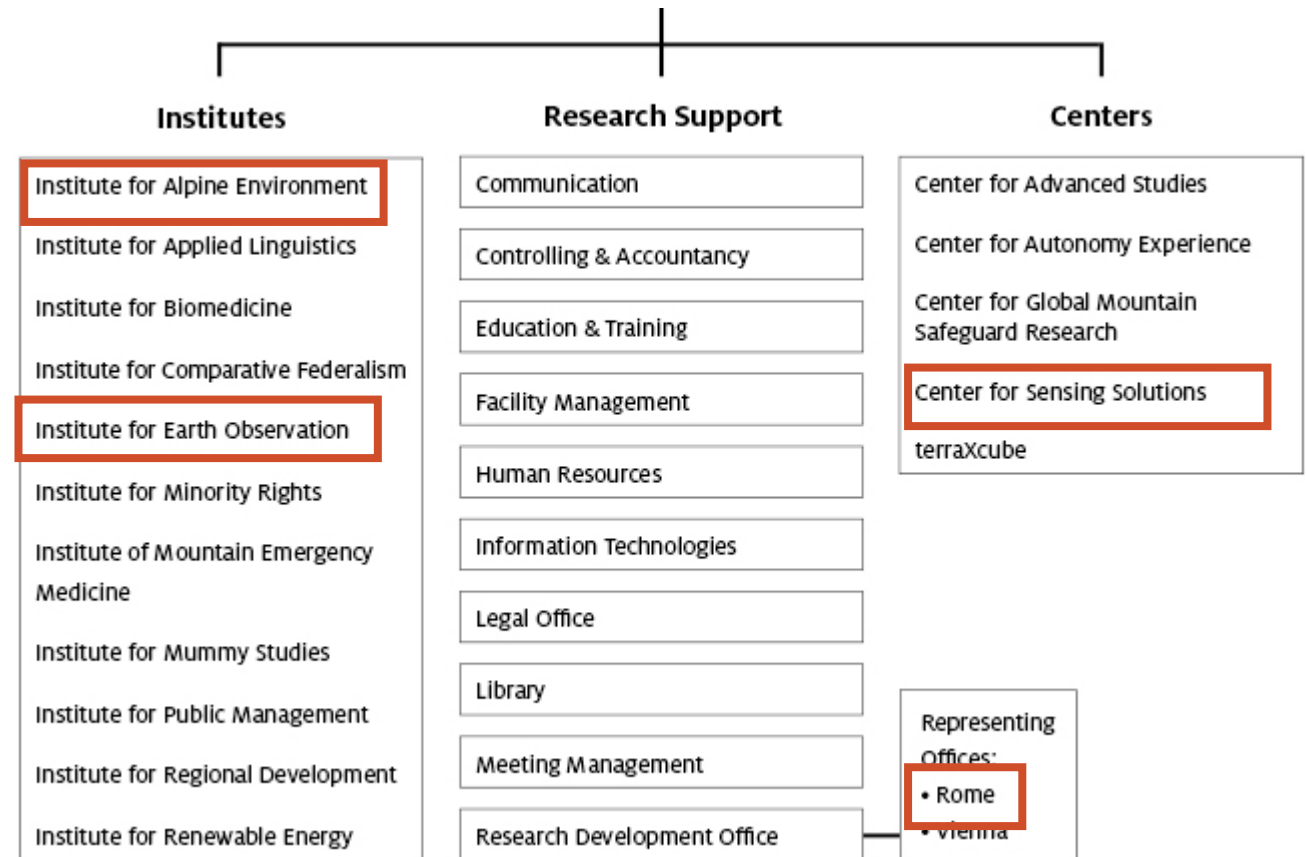
eurac research



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

About Eurac

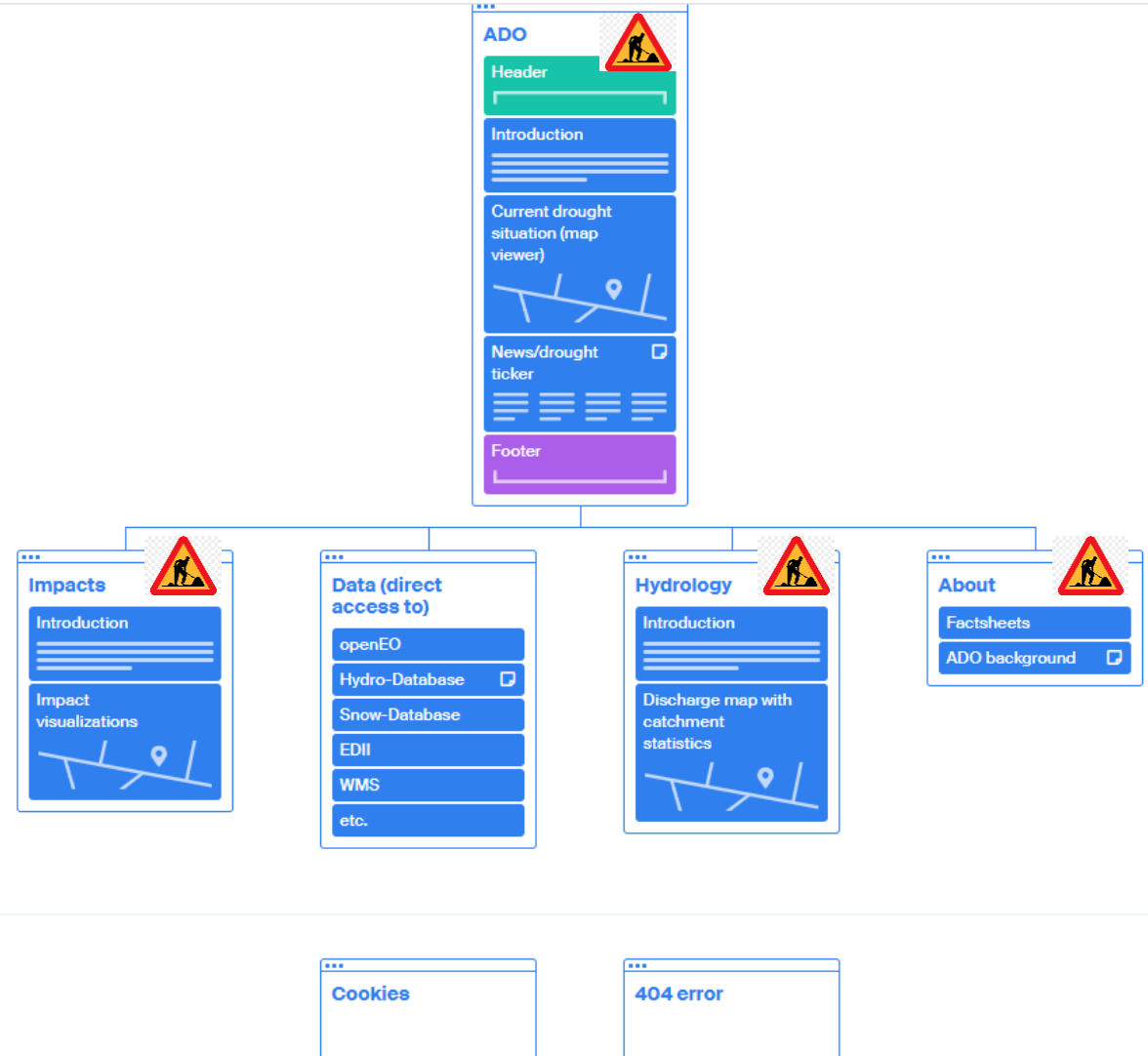
Overview



<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 the local authorities in the field of agriculture, water, and meteorology. He helps him to interpret the local situation.
Policy Maker, e.g. Alpine Convention, EUSALP	Sebastian Wagner is employed by the Alpine Convention. He published at the ADO website information on the current drought and management decisions for the region.
Scientist	Camille Bernard is a researcher at the University of Burgundy. She is studying the wine harvest of the following years and its impact on the environment for her study.
PhD, Expert in drought risk	Ramona Muhr is a PhD student at the University of Applied Sciences. She is studying hazard and impact data to develop a drought risk assessment model.
Advisor for agriculture	Lara Schmidt is an advisor for farmers in the region. She provides information on the current drought and its impact on agriculture.
Private person impacted by drought	Karl Mueller is currently impacted by the drought. He is looking for more information about the current drought and the possibility to search for water.
Forester in an Alpine area	Lina Rahm is a forest manager in an Alpine area. She needs to get more information about the current drought and its impact on the forest.
Journalist for environmental topics	Peter F. is a Journalist for environmental topics. He is writing an article about the current drought and its impact on the environment. He needs to gather information more frequent and extreme.
Content manager	
Official at Administration for Civil Protection and Disaster Relief	Ana V. is an official at ACPD. She is responsible for the ADO platform to prepare an overview of the conditions over a region.



Infrastructure

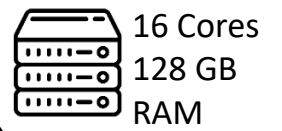
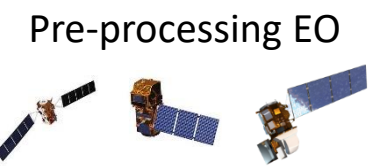
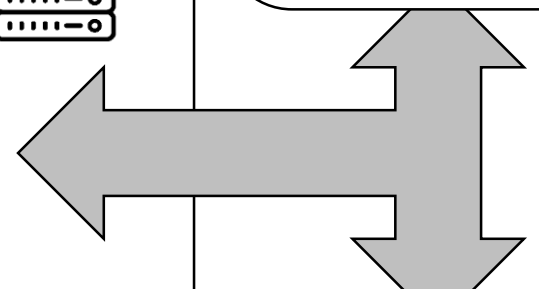
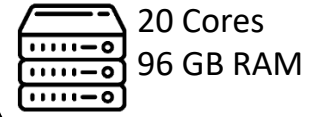
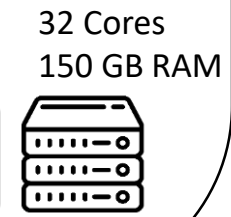
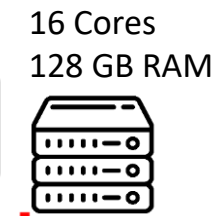
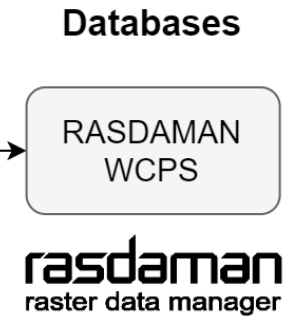
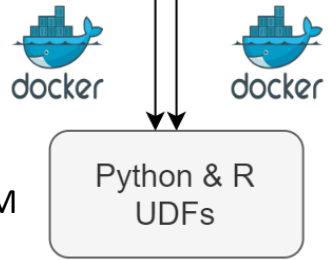
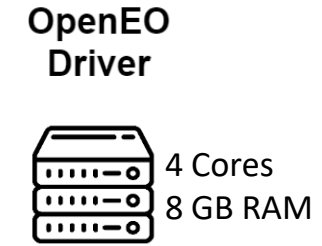
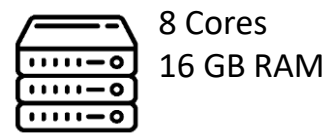
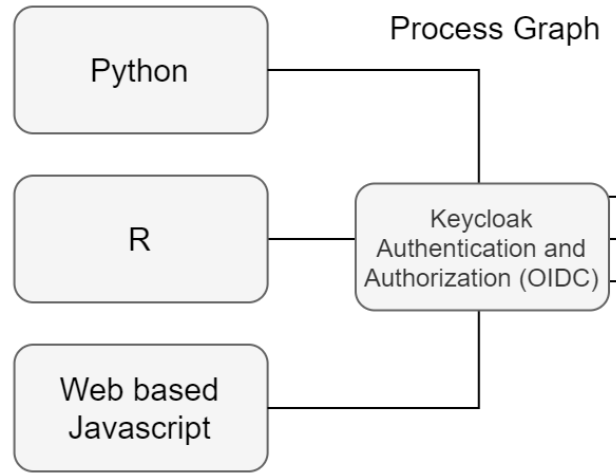


<https://openeo.org/>

eurac
research



OpenEO Clients



ADO on git



ADO

A **ADO**

 Group ID: 1379 [Leave group](#)

ADO > openEO4ADO

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

O **openEO4ADO**

 Project ID: 3759

57 Commits | 1 Branch | 0 Tags | 2.7 MB Files | 2.7 MB Storage

Tutorial and snippets on how to use openEO in the ADO project

master | openeo4ado / + | History | Find file | Web IDE | Download | Clone

Update README.md

 Zellner Peter James authored 17 hours ago

 a4fbe5e3

- README
- Auto DevOps enabled
- Add LICENSE
- Add CHANGELOG
- Add CONTRIBUTING

Name	Last commit	Last update
python	Update ADO_Python_Tutorial.ipynb	1 month ago
r	updated login procedure	1 week ago
register_and_login_guide	Update README.md	17 hours ago
README.md	fixed my name	1 day ago

README.md

openEO4ADO

Tutorial and snippets on how to use openEO in the ADO project

vhi

 scripts for downloading mod11a1 and mod09, calculation of land surface temperature, ...

ogram.

dated d

1

1

23 hours

1 day

3 days

1 month

1 month

1 month

2 months

2 months

4 months ago

ADO > openEO4ADO

 master | openeo4ado / python / + | History | Find file | Web IDE | Download | Clone

Update ADO_Python_Tutorial.ipynb

 Claus Michele authored 1 month ago

 e1ad4d89

Name	Last commit	Last update
..		
.gitkeep	Update .gitkeep	1 month ago
ADO_Python_Tutorial.ipynb	Update ADO_Python_Tutorial.ipynb	1 month ago
README.md	Update README.md	1 month ago
environment.yml	added openeo conda environment	1 month ago
eo_utils.py	added eo_utils.py	1 month ago

README.md

Accessing and Analyzing ADO Datasets with openEO

Author michele.claus@eurac.edu

Date: 2021/04/15

Useful links:

OpenEO Python Client documentation: <https://open-eo.github.io/openeo-python-client/index.html>

ADO pipelines



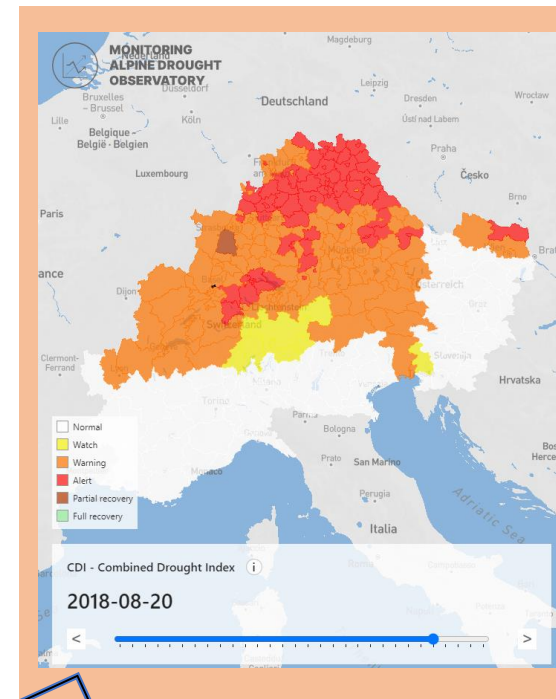
- Codes producing Data
- Environment Files
- Documentation
- (Docker Image)



GitLab



- Docker
- CI/CD
- Kubernetes
- Triggering



Development of Code

Changes are directly integrated to pipeline

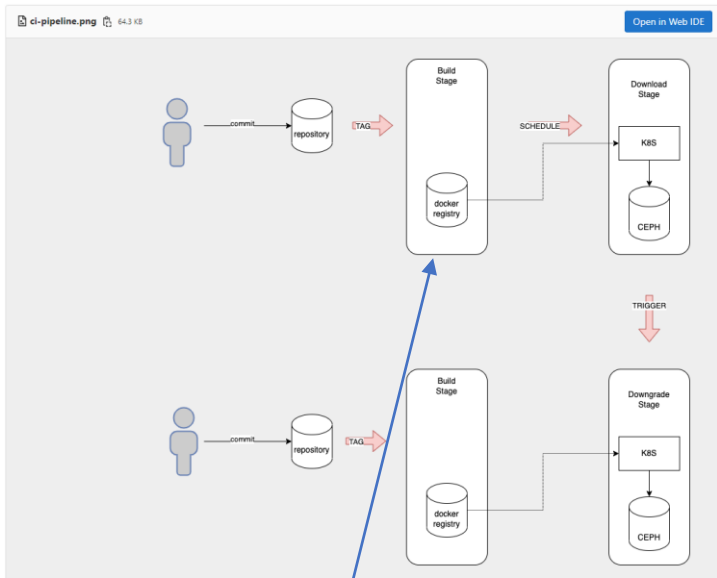
Modules of the pipelines can be triggered by different events

Results are directly integrated into web-portal

Pipeline Operations



Pipeline




Jobs

Cattani Luca > ADO Download Operational > Jobs

All 113 Pending 0 Running 0 Finished 113

Status	Name	Job	Pipeline	Stage	Duration
passed	on-schedule-download	#41422 master -> eda14464	#23616 by Cattani Luca	test	00:01:10 7 hours ago
passed	on-schedule-download	#41313 master -> eda14464	#23592 by Cattani Luca	test	00:01:10 1 day ago
passed	on-schedule-download	#41275 master -> eda14464	#23578 by Cattani Luca	test	00:01:09 2 days ago
passed	on-schedule-download	#41244 master -> eda14464	#23565 by Cattani Luca	test	00:01:10 3 days ago
passed	on-schedule-download	#41217 master -> eda14464	#23548 by Cattani Luca	test	00:01:09 4 days ago
passed	on-schedule-download	#41195 master -> eda14464	#23536 by Cattani Luca	test	00:01:10 5 days ago
passed	on-schedule-download	#41174 master -> eda14464	#23525 by Cattani Luca	test	00:01:10 6 days ago

Success Mail



✓ Pipeline #23244 has passed!

Project: Cattani Luca / ADO Download Operational
 Branch: master
 Commit: ~ 7205ce20
 Merge branch 'master' of gitlab.inf.unibz.it:Lu...
 Commit Author: Cattani Luca

Pipeline #23244 triggered by Cattani Luca

Error Mail

✗ Pipeline #22804 has failed!

Project: Cattani Luca / ADO Download Operational
 Branch: master
 Commit: ~ b2622371
 Update .gitlab-ci.yml file
 Commit Author: Cattani Luca

Pipeline #22804 triggered by Cattani Luca
 had 1 failed job.

Variables

Variables store information, like passwords and secret keys, that you can use in job scrip

Variables can be:

- Protected: Only exposed to protected branches or tags.
- Masked: Hidden in job logs. Must match masking requirements. [Learn more.](#)

Type	Key	Value	Protecte
Variable	CDSAPI_KEY	*****	×

Add variable Reveal values

Schedule

Edit Pipeline Schedule

Description

download

Interval Pattern

- Every day (at 5:00am)
- Every week (Friday at 5:00am)
- Every month (Day 0 at 5:00am)
- Custom (Cron syntax)

0 3 * * *

Cron Timezone

UTC

API Key etc.



Current List of Production Indices

MOD16 Evapotranspiration - 500 m

ADO_EVAP_SSEBOP_1km_4326
SSEBop Evapotranspiration - 1 km

ADO_LST_MODIS_231m_3035
Land Surface Temperature - 231m 8 day mean

ADO_NDVI_MODIS_231m_3035
Normalized Difference Vegetation Index - 231m 8 day Maximum Value Composite

ADO_NDVI_MODIS_231m_3035_ODC
ADO_NDVI_MODIS_231m_3035_ODC

ADO_REL_RR_1_ERA5_QM
Precipitation Anomalies - ERA5_QM REL_RR-1

ADO_REL_RR_2_ERA5_QM
Precipitation Anomalies - ERA5_QM REL_RR-2

ADO_REL_RR_3_ERA5_QM
Precipitation Anomalies - ERA5_QM REL_RR-3

ADO_REL_RR_6_ERA5_QM
Precipitation Anomalies - ERA5_QM REL_RR-6

ADO_REL_RR_12_ERA5_QM
Precipitation Anomalies - ERA5_QM REL_RR-12

ADO_SM_anomalies_ERA5
Soil Moisture Anomalies - ERA5

ADO_SPEI_1_ERA5_QM
Standardised Precipitation-Evapotranspiration Index - ERA5_QM

ADO_SPEI_2_ERA5_QM
Standardised Precipitation-Evapotranspiration Index - ERA5_QM

ADO_SPEI_3_ERA5_QM
Standardised Precipitation-Evapotranspiration Index - ERA5_QM

ADO_SPEI_6_ERA5_QM
Standardised Precipitation-Evapotranspiration Index - ERA5_QM

ADO_SPEI_12_ERA5_QM
Standardised Precipitation-Evapotranspiration Index - ERA5_QM

ADO_SPI_1_ERA5_QM
Standardised Precipitation Index - ERA5_QM SPI-1

ATMOSPHERE



1. Precipitation Anomalies (%)

2. Standardised Precipitation Index

TOP-SOIL



3. Standardised Precipitation-Evapotranspiration Index

4. Soil Moisture Anomalies

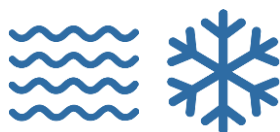
VEGETATION HEALTH



5. Normalized Difference Vegetation Index

6. Vegetation Health Index (VHI)

SURFACE WATER GROUNDWATER



7. Standardised Snowpack Index

8. Hydrological Indices (SDI, SGI)

+ combined drought index - CCI

+ integration of impacts

Current List of Production Indices



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

GetCapabilities
DescribeCoverage
GetCoverage
ProcessCoverages
DeleteCoverage
InsertCoverage

WCS service endpoint:
Get Capabilities

119 coverages available, total volume 8.94 TB

Coverage ID	Coverage subtype	Coverage size	Display footprints
<input type="text" value="ADO"/>			
ADO_SM_anomalies_ERA5_QM	RectifiedGridCoverage	16.1 GB	<input type="checkbox"/>
ADO_SPEI_12_ERA5_QM	ReferenceableGridCoverage	1.97 GB	<input type="checkbox"/>
ADO_SPEI_1_ERA5_QM	ReferenceableGridCoverage	1.97 GB	<input type="checkbox"/>
ADO_SPEI_2_ERA5_QM	ReferenceableGridCoverage	1.97 GB	<input type="checkbox"/>
ADO_SPEI_3_ERA5_QM	ReferenceableGridCoverage	1.97 GB	<input type="checkbox"/>
ADO_SPEI_6_ERA5_QM	ReferenceableGridCoverage	1.97 GB	<input type="checkbox"/>
ADO_SPI_12_ERA5_QM	ReferenceableGridCoverage	1.97 GB	<input type="checkbox"/>
ADO_SPI_1_ERA5_QM	ReferenceableGridCoverage	1.97 GB	<input type="checkbox"/>
ADO_SPI_2_ERA5_QM	ReferenceableGridCoverage	1.97 GB	<input type="checkbox"/>
ADO_SPI_3_ERA5_QM	ReferenceableGridCoverage	1.97 GB	<input type="checkbox"/>

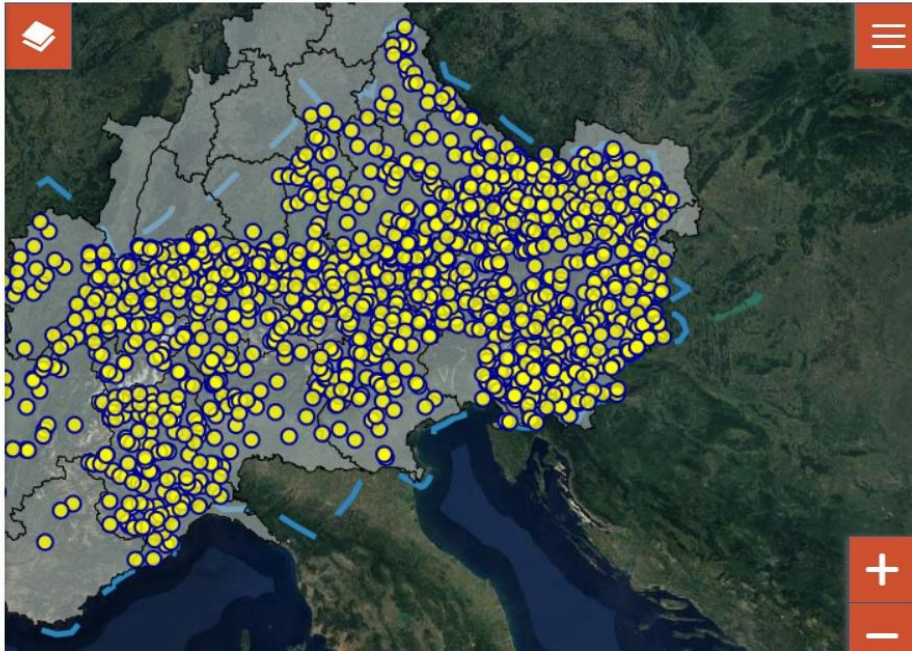
First
Previous
1
2
3
Next
Last

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

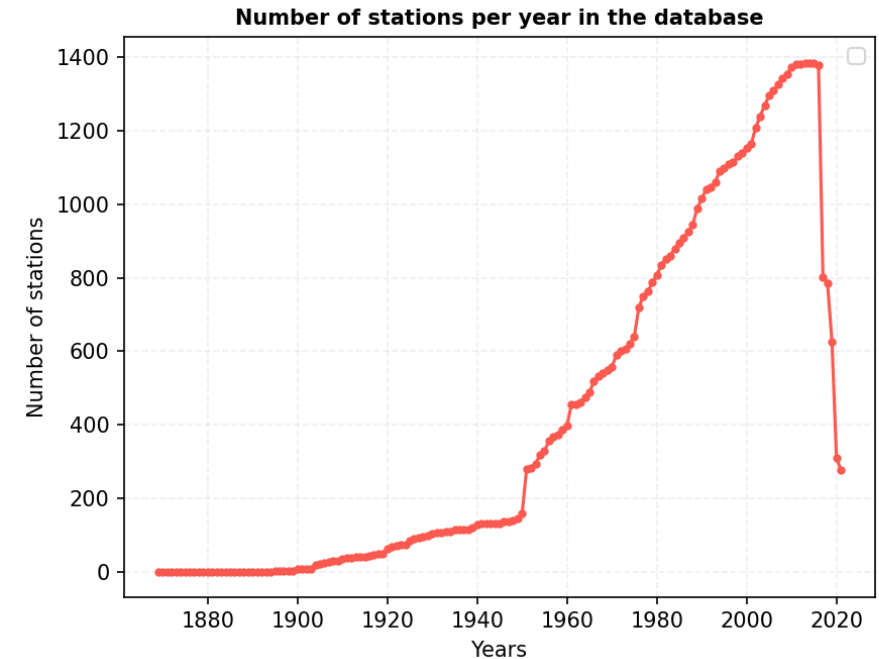


Alpine-wide dataset: discharge, water level, groundwater level, metadata
 Problems: **different data providers**, real time data availability

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



Meta Data

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

NEXTGEOSS

DATA PROVIDERS DATA COLLECTIONS THEMATIC AREAS OPENSEARCH LEARN MORE SUPPORT ABOUT LOGIN

The screenshot displays the NEXTGEOSS web application interface. On the left, there is a vertical sidebar with navigation icons: a magnifying glass for 'Search', an upload icon for 'Catalogue your data', a globe for 'Search in GEOSS', and a speech bubble for 'Send us feedback'. The main area features a satellite map of Europe and the Mediterranean region. A data catalog overlay is positioned in the center, showing a list of datasets. The top entry is 'Precipitation Anomalies - ERA5_QM REL_RR-12' by EURAC Research, with a description: 'Relative precipitation anomalies are based on downscaled ERA5 reanalysis data...'. Below this, a detailed view for the same dataset is shown, including a 'See more' link and a '0.0' rating. The bottom of the catalog shows 'Sources: GEOSS [24]' and 'Powered by GEOSS'. Navigation arrows at the bottom indicate '1 of 2' items.

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

SPEI-6 - Standardized Precipitation and Evapotranspiration Index - 6 ⓘ

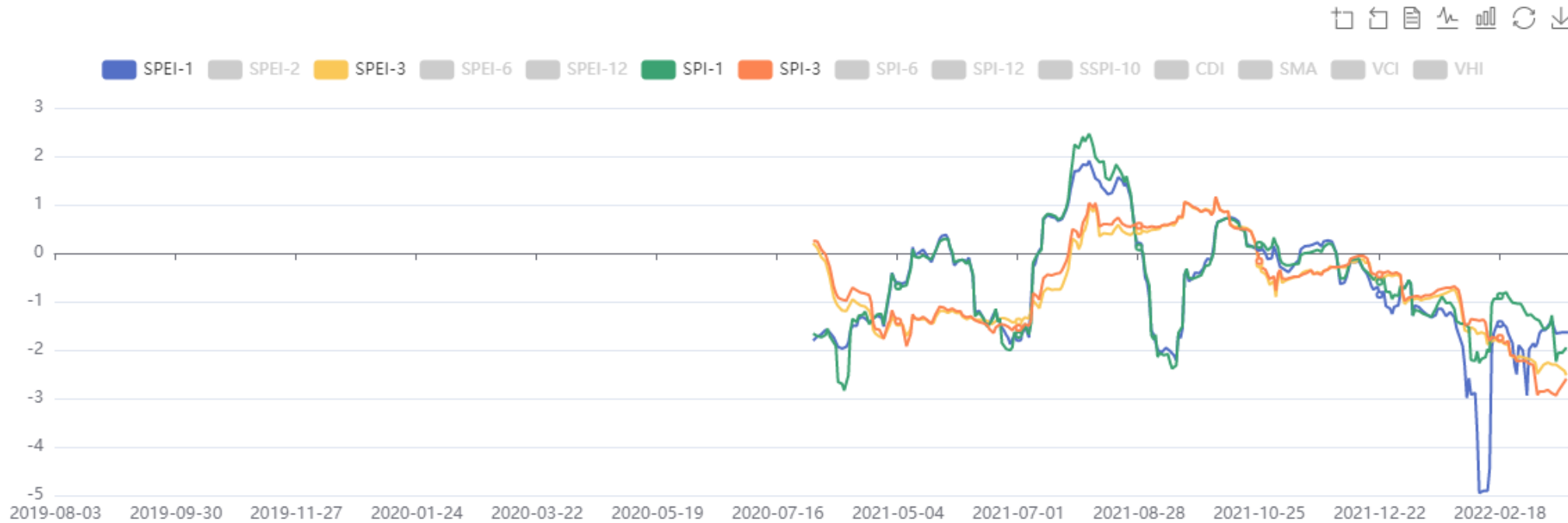
2022-03-23

- SPEI-1
- SPEI-2
- SPEI-3
- SPEI-6**
- SPEI-12
- SPI-1
- SPI-3
- SPI-6
- SPI-12
- SSPI-10
- CDI
- SMA
- VCI
- VHI

⚠
This page is under development. Do not expect everything to work.
More information about the project at <https://www.alpine-space.org/projects/ado/>
Raw data can be found in the public repository <https://github.com/Eurac-Research/ado-data>
Eurac Research, June 2022

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

close X



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

SPEI-6 - Standard

2022-03

< [Timeline bar]

SPEI-1 SPEI

- Slovensko
- Indicies
- Impacts
- Nuts 3 Level
- Nuts 2 Level
- Hydro
- About the Data
- Magyarország
- About the Project

under development. Do not
thing to work.
ation about the project at
alpine-space.org/projects/ado/
in be found in the public repository
github.com/Eurac-Research/ado-data

rch, June 2022

Srbija

+
-
↑
↓

50 km

© OpenStreetMap Improve this map

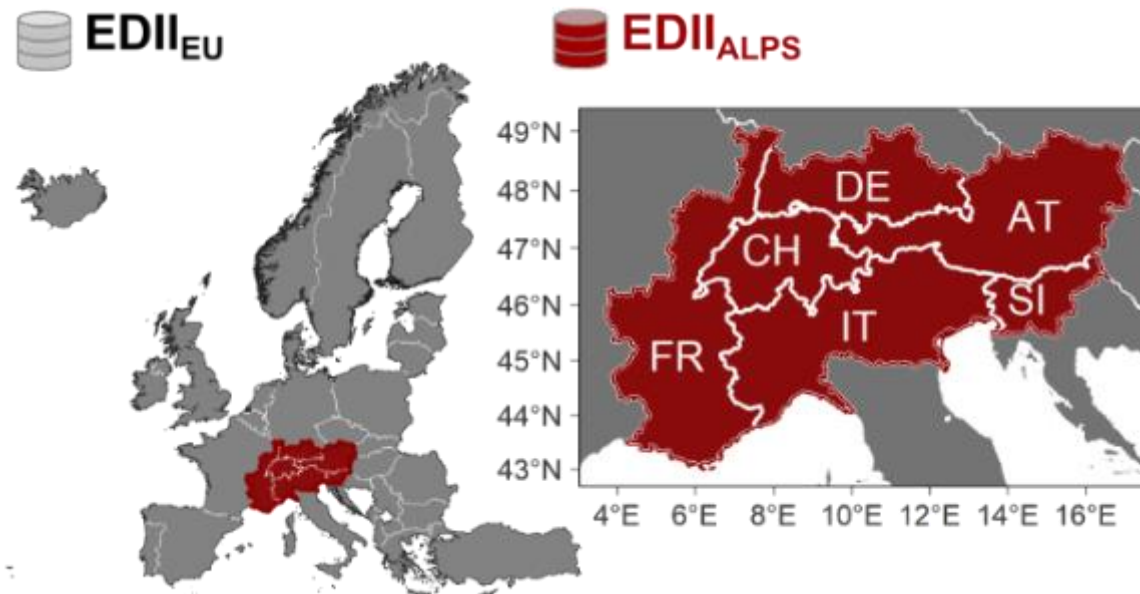
Drought Impacts

- Substantial update of EDII database

- Various German and Italian text-reports
- Unwetterchronik ZAMG
- Drought.ch
- DMCSEE
- Propluvia.fr

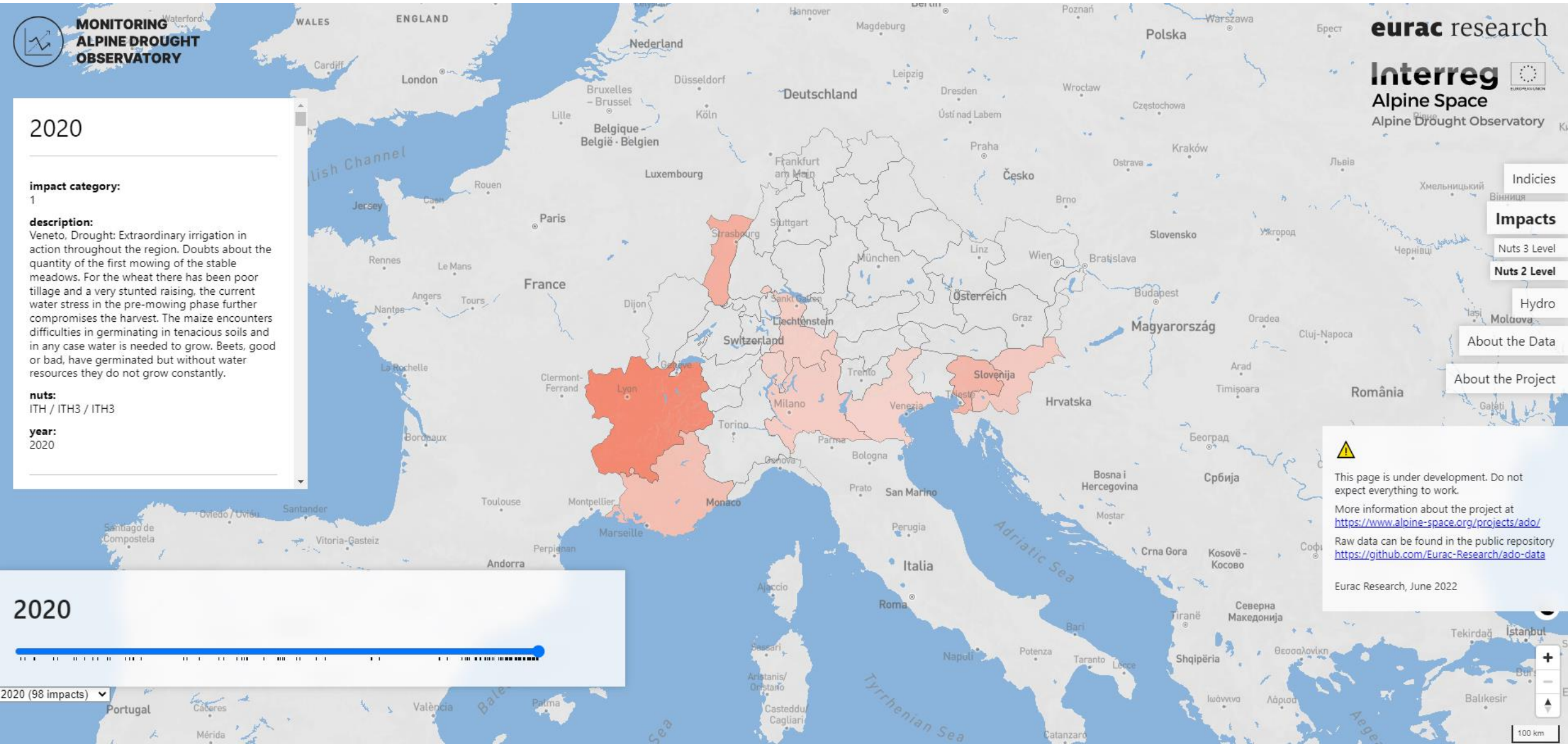
- Filtered to the Alpine Space

→ 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




MONITORING ALPINE DROUGHT OBSERVATORY

2020

impact category:
 1

description:
 Veneto, Drought: Extraordinary irrigation in action throughout the region. Doubts about the quantity of the first mowing of the stable meadows. For the wheat there has been poor tillage and a very stunted raising, the current water stress in the pre-mowing phase further compromises the harvest. The maize encounters difficulties in germinating in tenacious soils and in any case water is needed to grow. Beets, good or bad, have germinated but without water resources they do not grow constantly.


nuts:
 ITH / ITH3 / ITH3

year:
 2020

2020



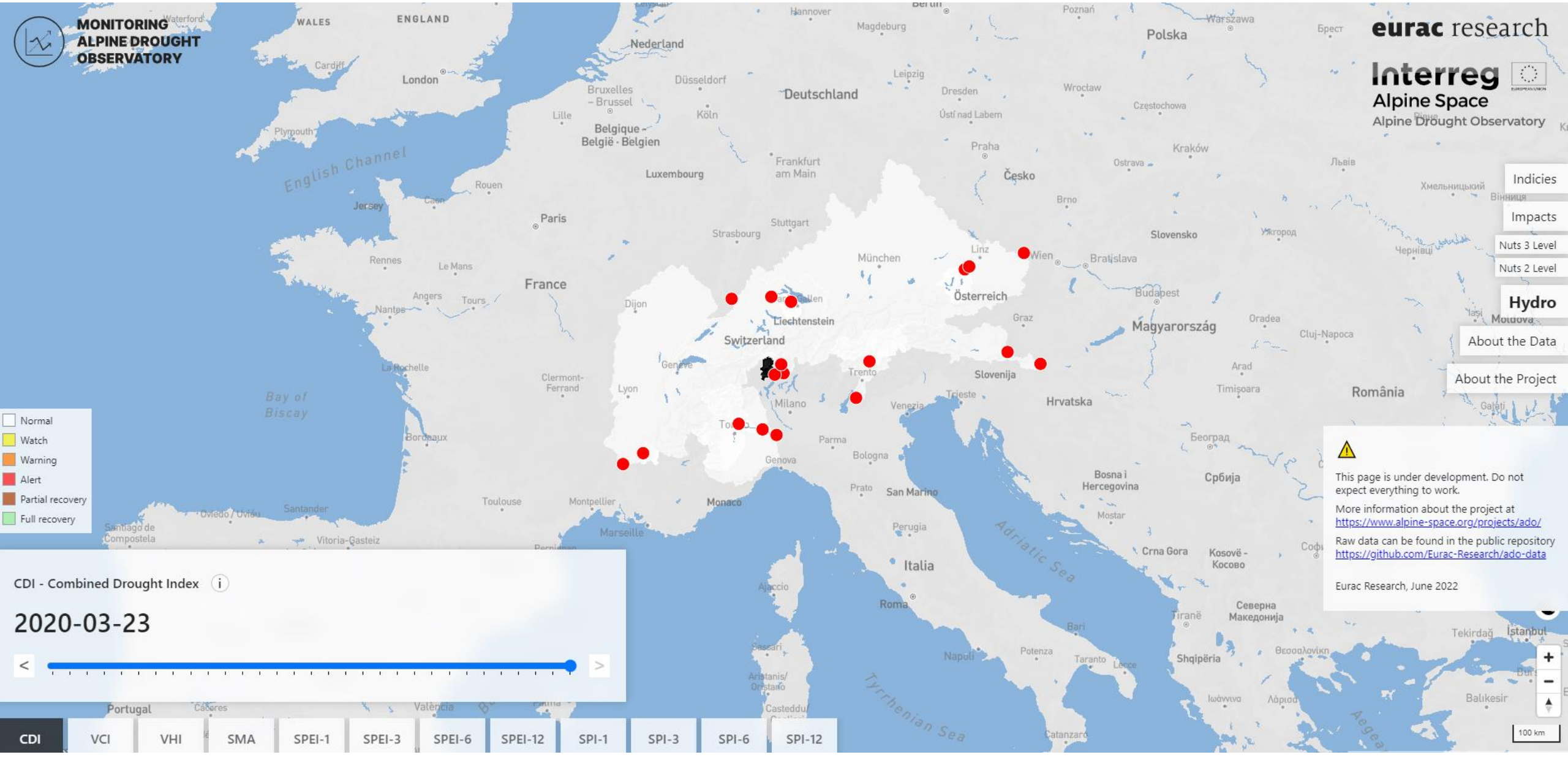
2020 (98 impacts)


 This page is under development. Do not expect everything to work.
 More information about the project at <https://www.alpine-space.org/projects/ado/>
 Raw data can be found in the public repository <https://github.com/Eurac-Research/ado-data>
 Eurac Research, June 2022

- Indicies
- Impacts**
- Nuts 3 Level
- Nuts 2 Level
- Hydro
- Molava
- About the Data
- About the Project



Hydrology on the Portal



eurac research

Interreg Alpine Space
 Alpine Drought Observatory

Indicies

Impacts

Nuts 3 Level

Nuts 2 Level

Hydro

About the Data

About the Project



This page is under development. Do not expect everything to work.

More information about the project at <https://www.alpine-space.org/projects/ado/>
 Raw data can be found in the public repository <https://github.com/Eurac-Research/ado-data>

Eurac Research, June 2022



100 km



CDI - Combined Drought Index ⓘ
 2020-03-23
 < [Progress bar]
 [Map of Europe]
 Santiago de Compostela, Oviedo / Uviéu, Porto, Salamanca, Coimbra, Portugal, Cáceres
 CDI VCI VHI SMA

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

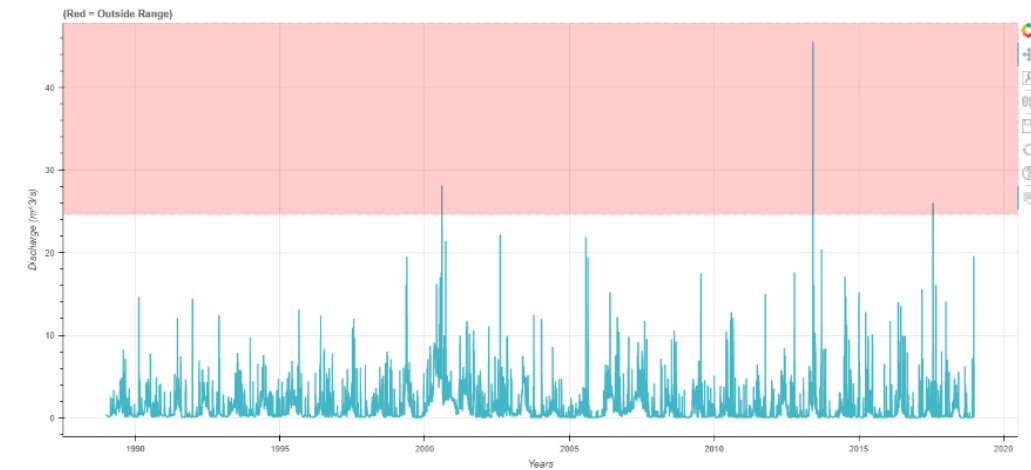
Statistic description of the dataset

	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

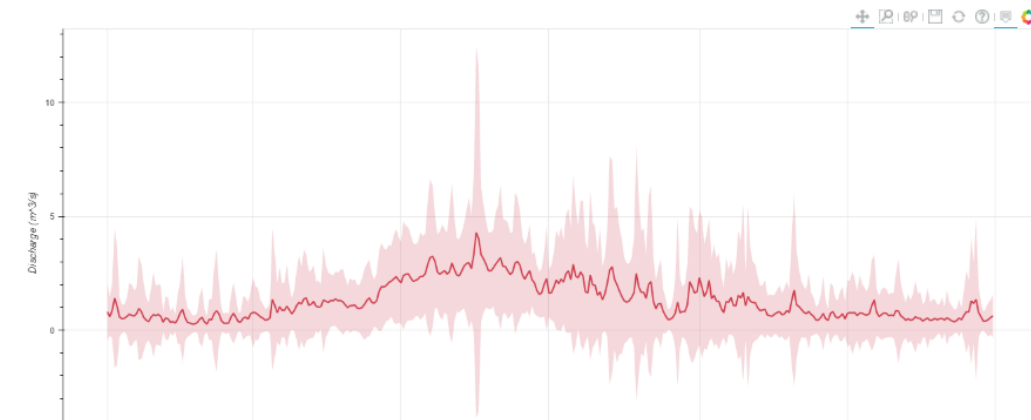
Discharge time series

Station ADO_DSC_CH05_0191 in Trento



Mean annual cycle

Station ADO_DSC_CH05_0191



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/>



✉ imc2022@uibk.ac.at

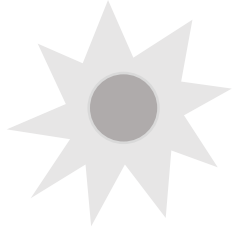


SUMMERSCHOOL

International Mountain Conference

September 11 - 15 2022

🌱 Status
CONFERENCE ON-SITE



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>