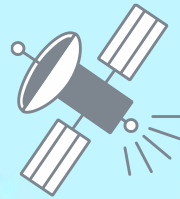




Interreg
Alpine Space
Alpine Drought Observatory
European Regional Development Fund



SAR₂



esa



Alexander Jacob, Peter Zellner, Michele Claus,
Bartolomeo Ventura

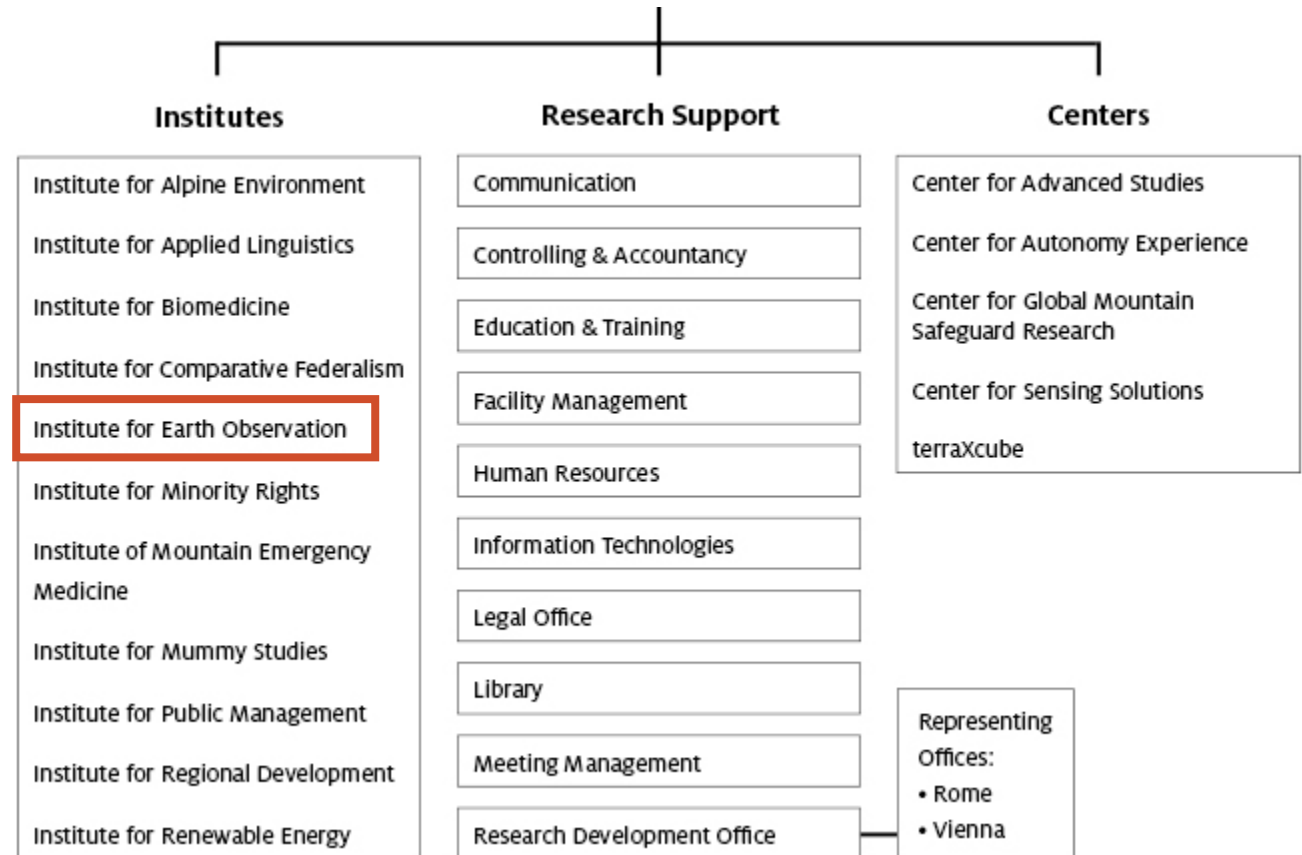


eurac research



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

Overview



<http://www.eurac.edu>



Climate and Disaster Risk

Scrutinising natural hazards, determining climate change impacts as well as assessing and managing related risks

- [Natural Hazards](#)
- [Risk and Resilience](#)



Earth Observation for Environmental Monitoring

Integrated monitoring of land surfaces for mountain environments and its dynamics

- [Water Resources and Cryosphere](#)
- [Vegetation and Land-Use Dynamics](#)



Advanced Computing for Earth Observation

Research and implementation of innovative solutions for simple EO data access and processing

- [Earth Observation Data Science](#)
- [Scientific Data Management and Processing](#)

Processing Infrastructure

SAR₂CUBE



OpenEO Clients



Python

Process Graph



R



Web based Javascript

OpenEO Driver



4 Cores
8 GB RAM

EURAC
OpenEO
Driver



docker

Python & R
UDFs



8 Cores
16 GB RAM

Databases

RASDAMAN
WCPS



8 Cores
128 GB RAM

rasdaman
raster data manager



OPEN DATA CUBE

DASK

ODC
DASK



16 Cores
64 GB RAM

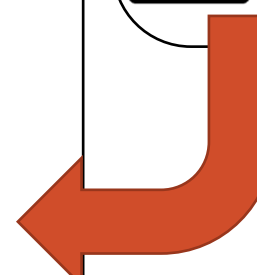


16 Cores
96 GB RAM

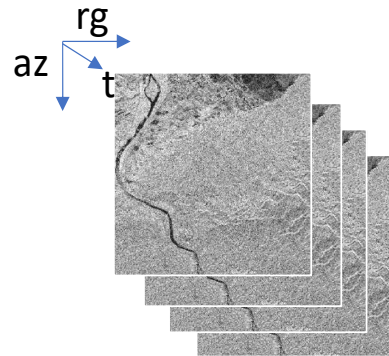
Pre-processing



16 Cores
160 GB RAM

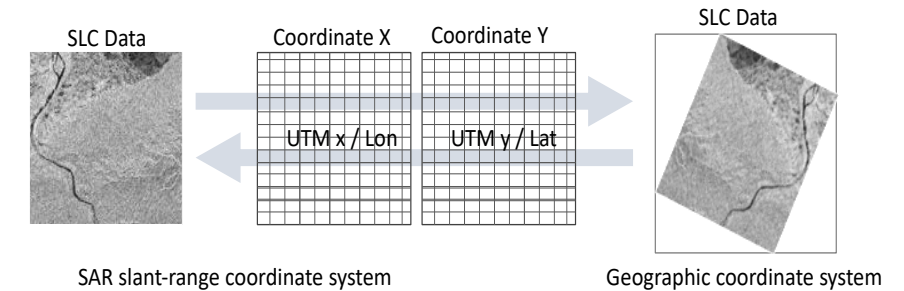


Output Unitary Data



Topographical phase component

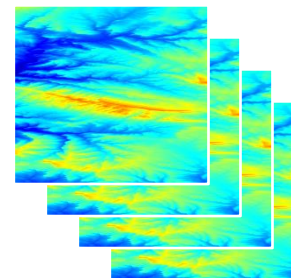
In DInSAR it is required to provide information to remove topographical and geometrical components. Computed exploiting the perpendicular baseline defined between each secondary image and the reference one



Complex S-1 A/B IW SLC data

Temporal stack of co-registered SLC images as the fundamental unit of the datacube.

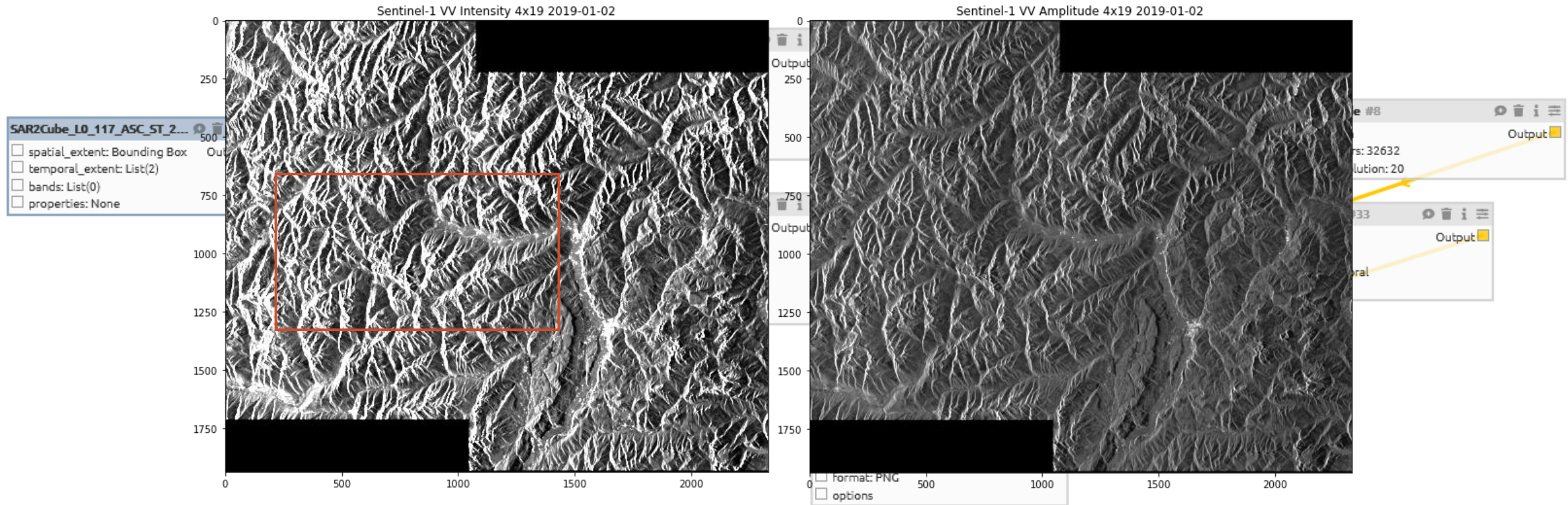
- Image alignment
- Radiometric calibration
- S-1 IW mode requires de-swathing and de-bursting
- Dual VV-VH polarizations



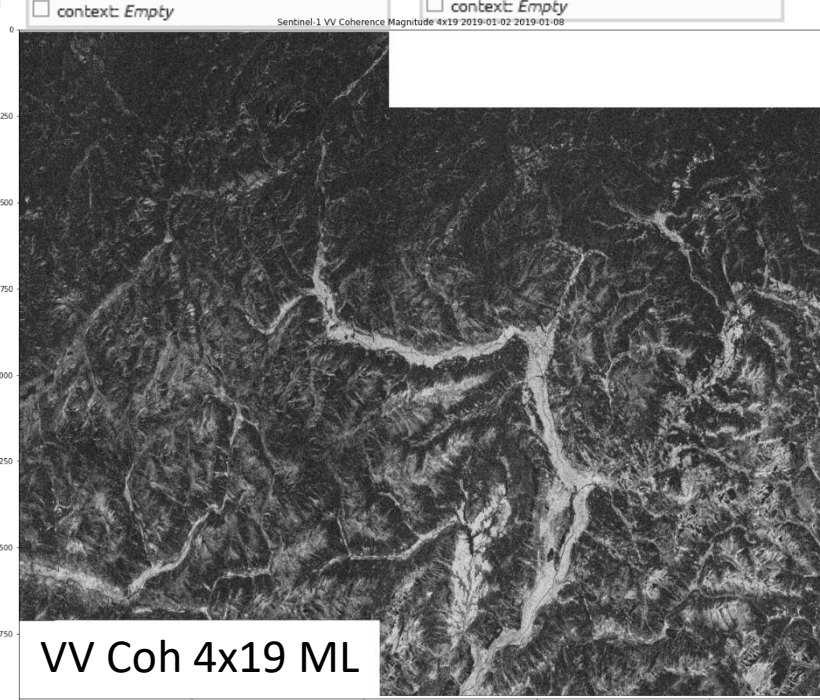
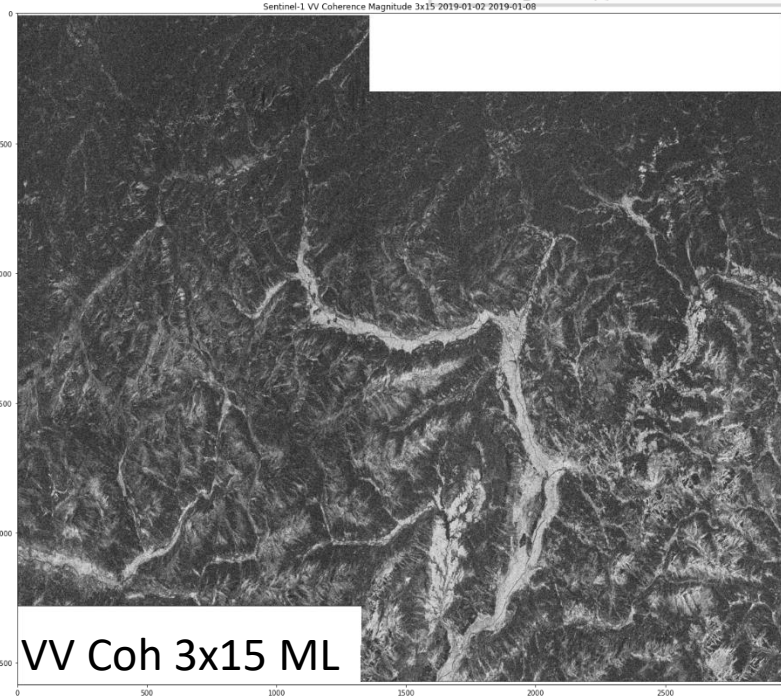
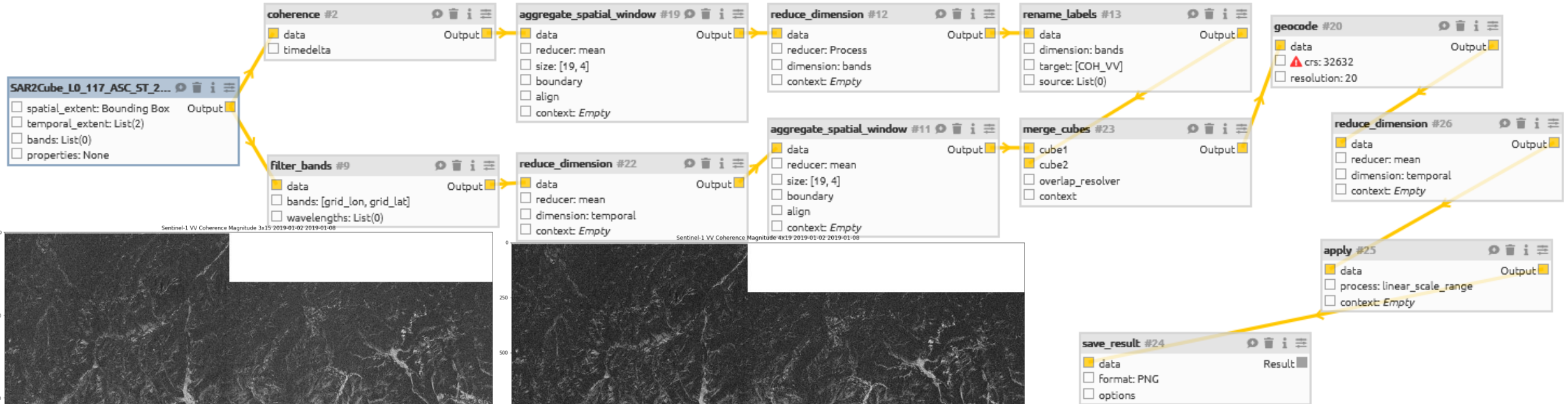
Georeferencing grid

The SLC data is defined in sensor geometry slant-range plane. The transformation from the sensor's domain to a more useful perspective, as a geographical coordinate system, it is required to include additional information to the Datacube

ARD OTF SAR generators. Amplitude/Intensity

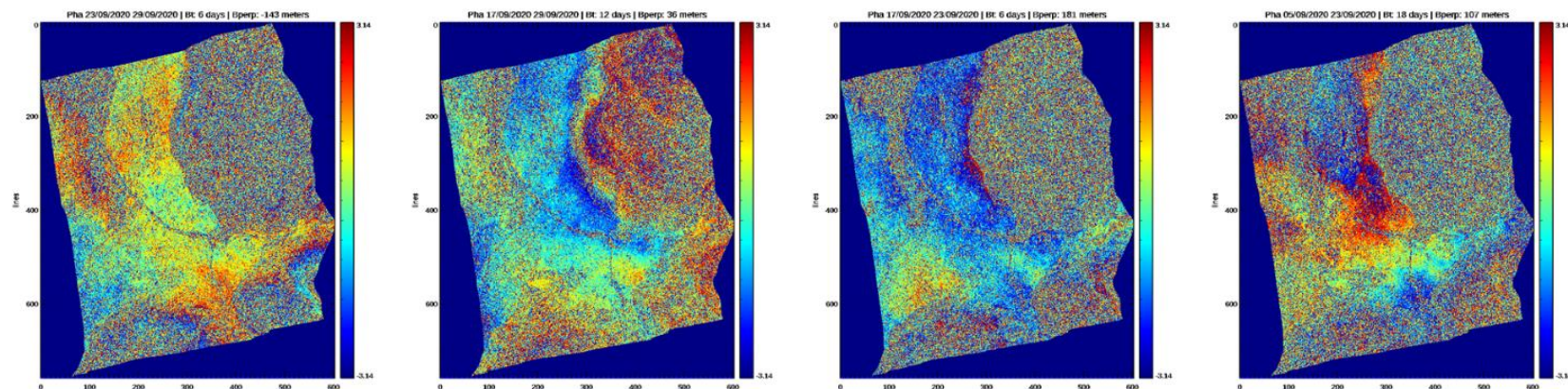


ARD OTF InSAR generators. Coherence

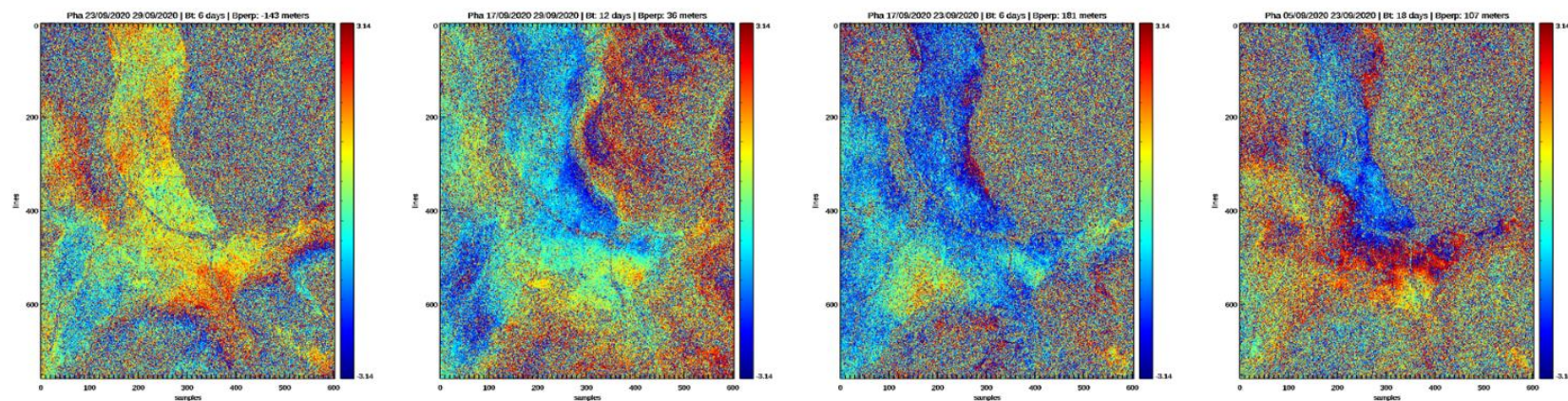


Terrain Motion with PSI

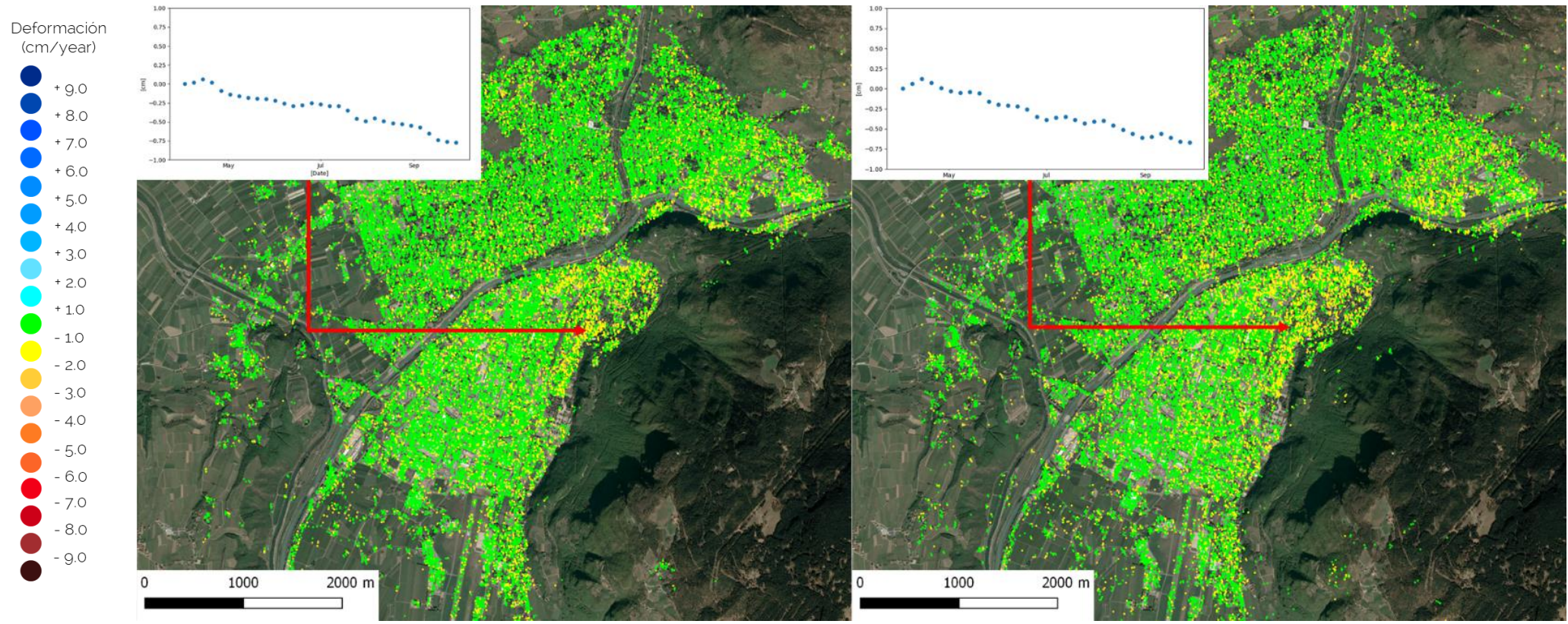
OTF SAR2CUBE Output



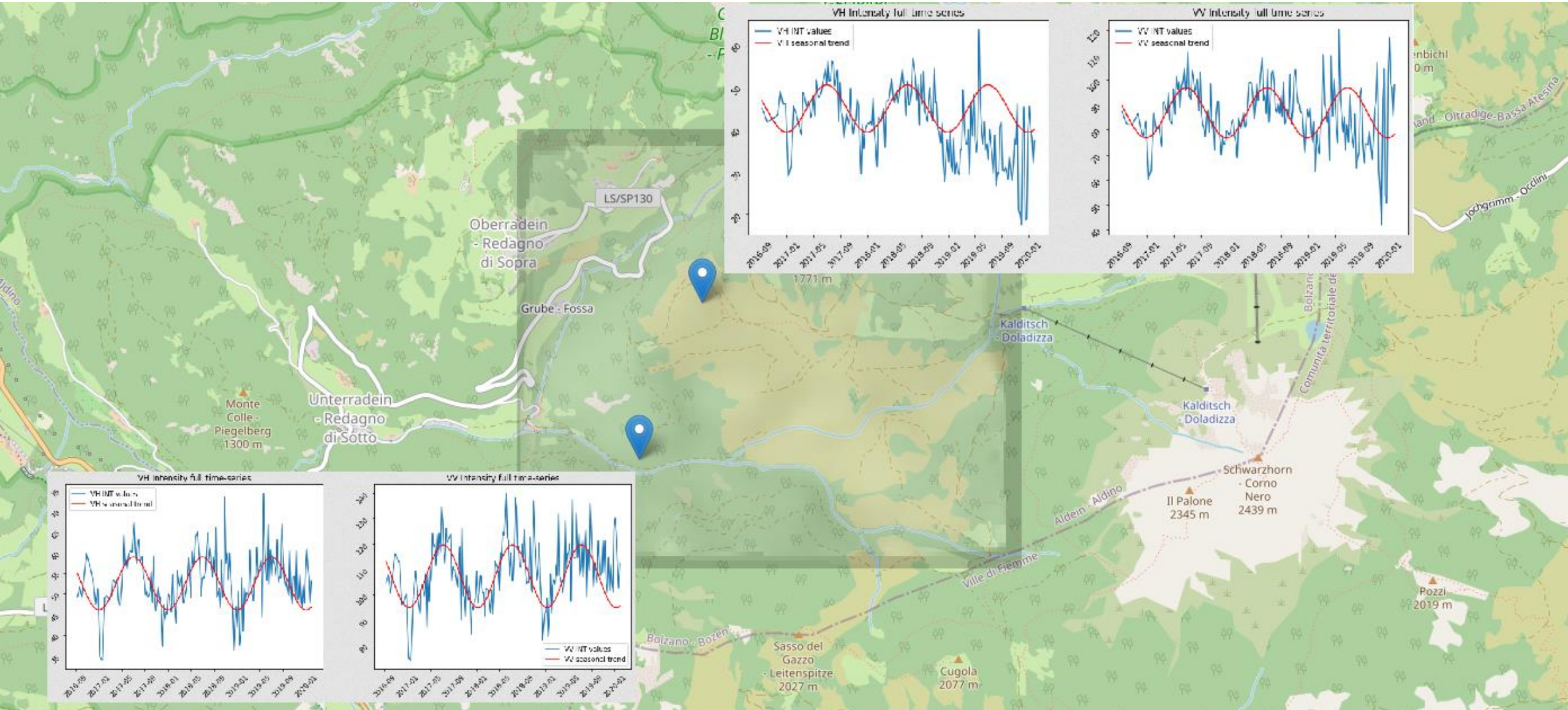
DARES PRISAR Output



Terrain Motion with PSI



Forest change detection



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

list of selected indices

Search

	MOD16 Evapotranspiration - 500 m
	ADO_EVAP_SSEBOP_1km_4326 SSEBop Evapotranspiration - 1 km
ATM	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
TOF	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
VEC	ADO_REL_RR_3_ERA5_QM Precipitation Anomalies - ERA5_QM REL_RR-3
HEA	ADO_REL_RR_6_ERA5_QM Precipitation Anomalies - ERA5_QM REL_RR-6
SUR	ADO_REL_RR_12_ERA5_QM Precipitation Anomalies - ERA5_QM REL_RR-12
GRC	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_SPI_1_ERA5_QM Standardised Precipitation Index - ERA5_QM SPI-1

1. Precipitation Anomalies (%) ✓
2. Standardised Precipitation Index (SPI) ✓
3. Standardised Precipitation-Evapotranspiration Index (SPEI) ✓
4. Soil Moisture Anomalies ✓
5. Normalized Difference Vegetation Index (NDVI) ✓
6. Vegetation Health Index (VHI) ✓
7. Standardised Snowpack Index (SSPI) ✓
8. Hydrological Indices (SDI, SGI, ...) ...

+ combined drought index - **COMBINING 2 OR MORE TOPICS**

+ integration of impacts



CI/CD for development and operational production



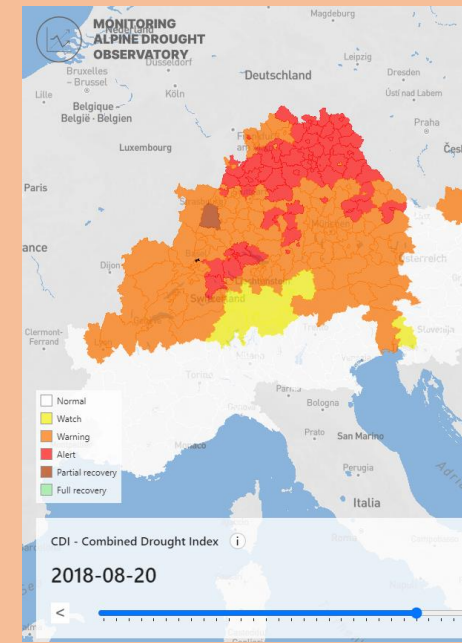
- Codes producing Data
- Environment Files
- Documentation
- (Docker Image)



GitLab



- Docker
- CI/CD
- Kubernetes
- Triggering

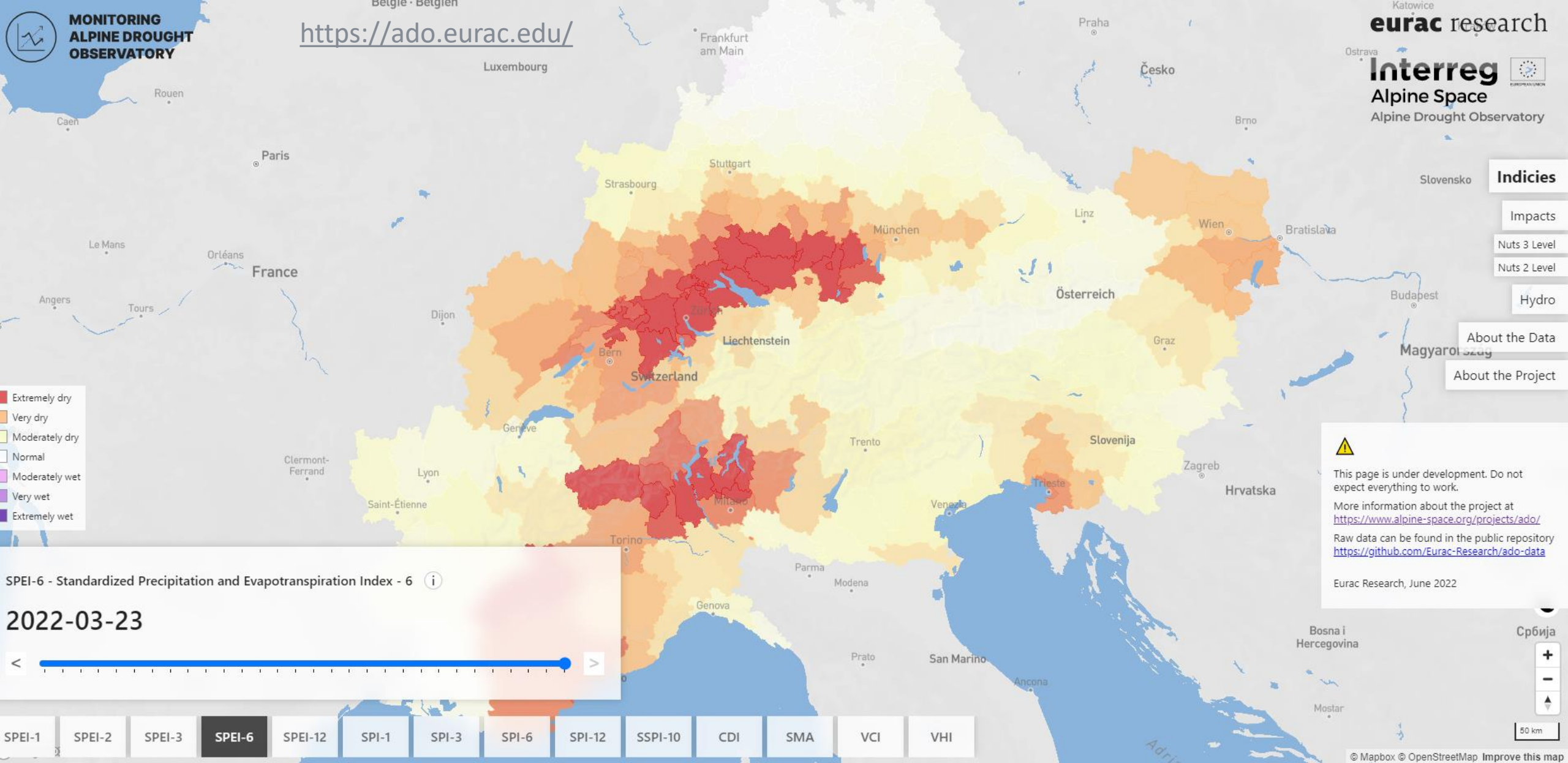


Development of Code

Changes are directly integrated to pipeline

Modules of the pipelines can be triggered by different events

Results are directly integrated into web-portal



- 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

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

2022-03-23

< [Timeline Slider] >

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

Thank you for your attention!

Questions & Answers?!

<https://ado.eurac.edu/>

<https://sar2cube.projects.eurac.edu/>

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

alexander.Jacob@eurac.edu