Earth Observation Data Centre

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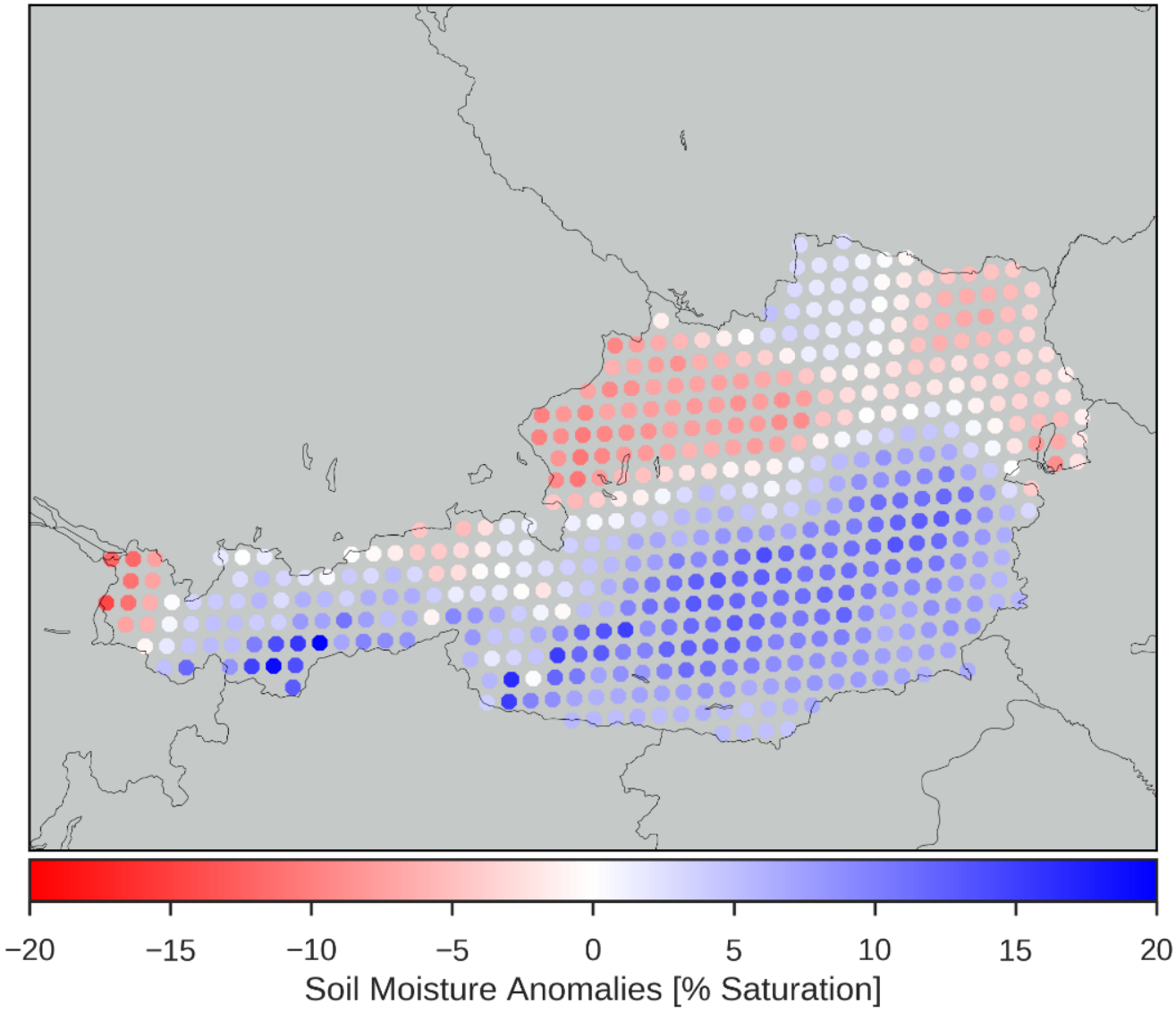
Corn Field in Upper Austria 31 August 2015


Corn Field in Upper Austria 19 August 2018

Satellite Soil Moisture Anomalies over Austria 2018



BMon

ASCAT soil moisture compared to 2007-2017

Data were detrended to account for land cover changes

Snow and frozen soil conditions were masked

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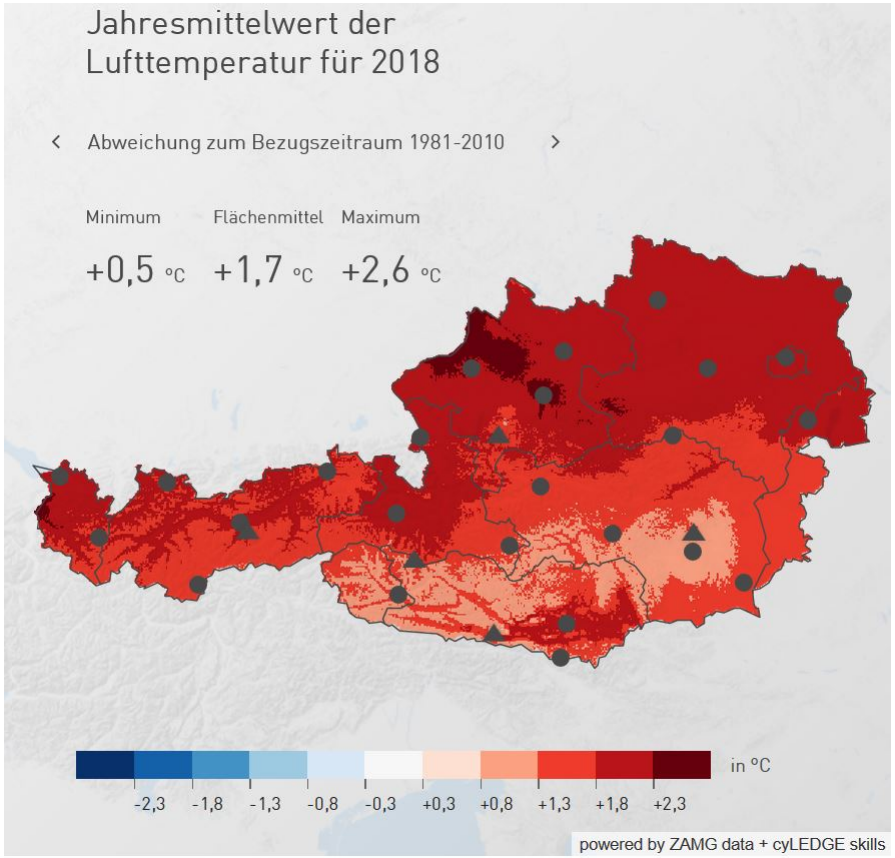
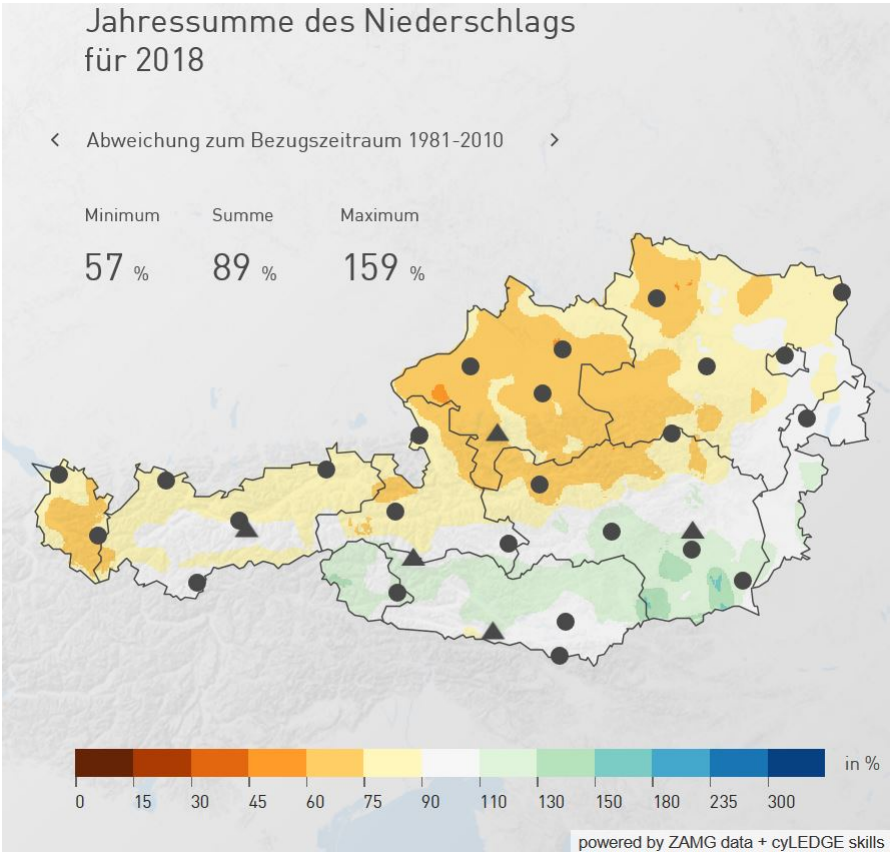
Climate in Austria in 2018

Temperature Anomaly

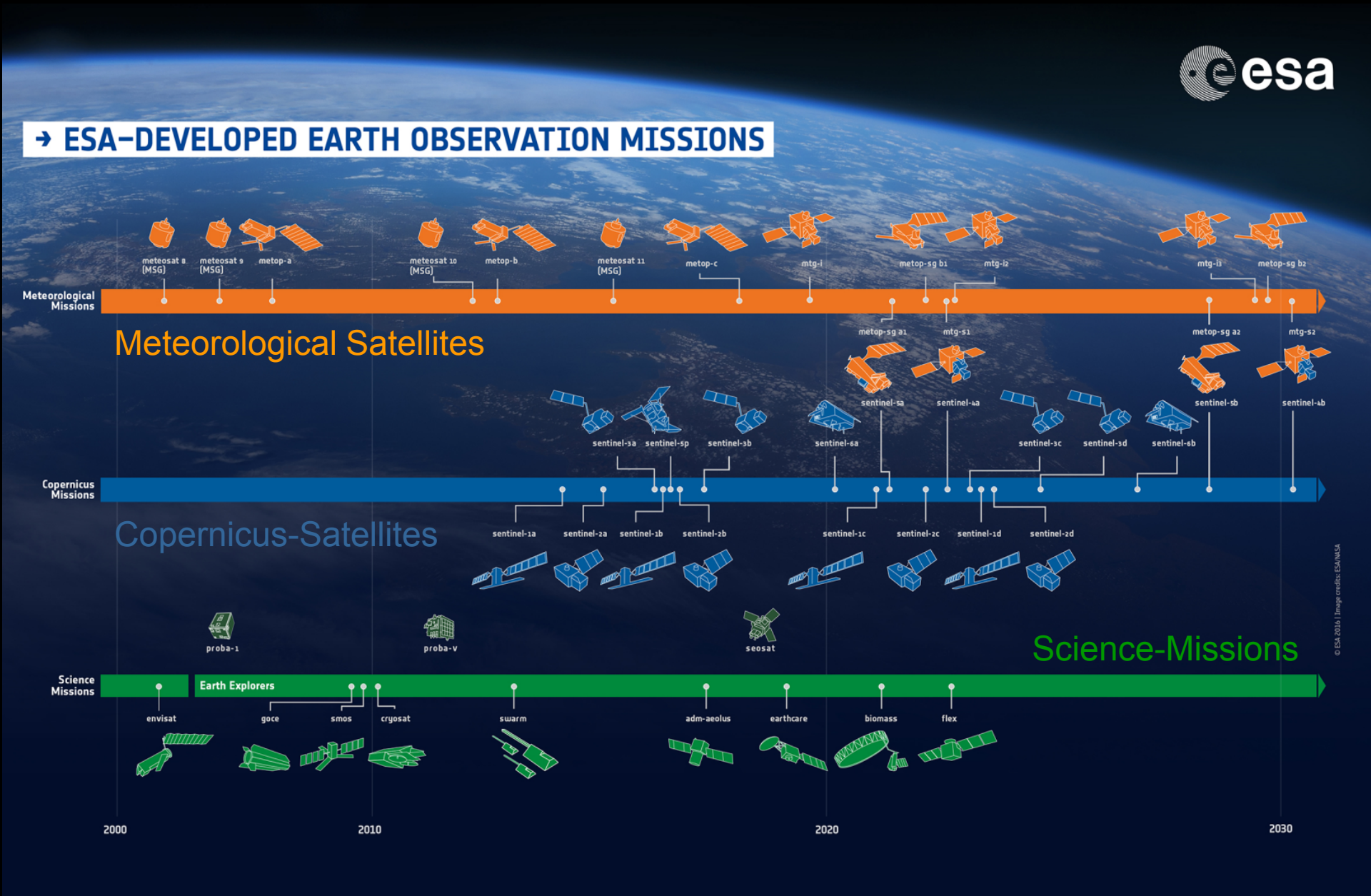


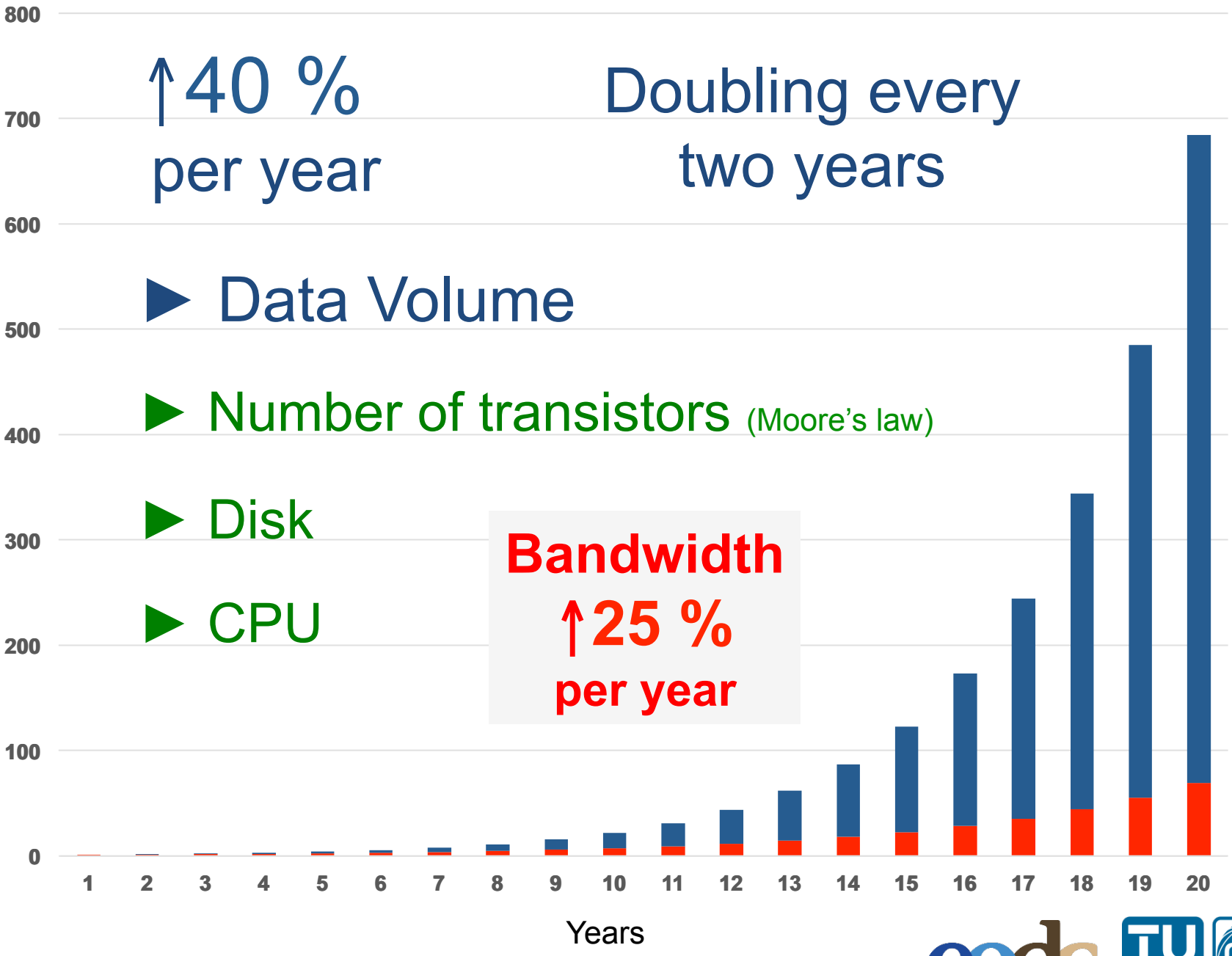
Rainfall Anomaly



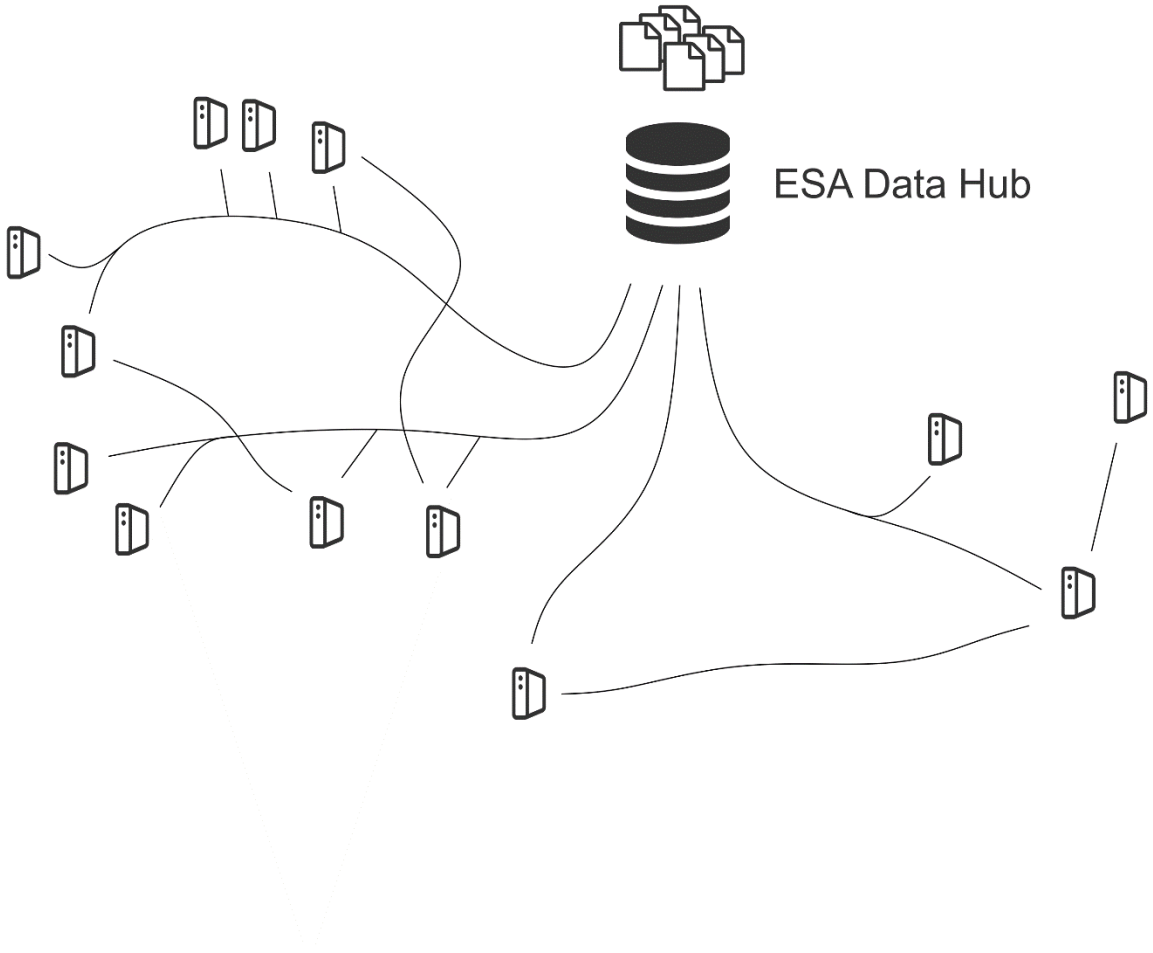
https://www.zamg.ac.at/cms/de/klima/klima-aktuell/klimamonitoring/
Data query on 20/10/2018

Earth Observation: A European Success Story

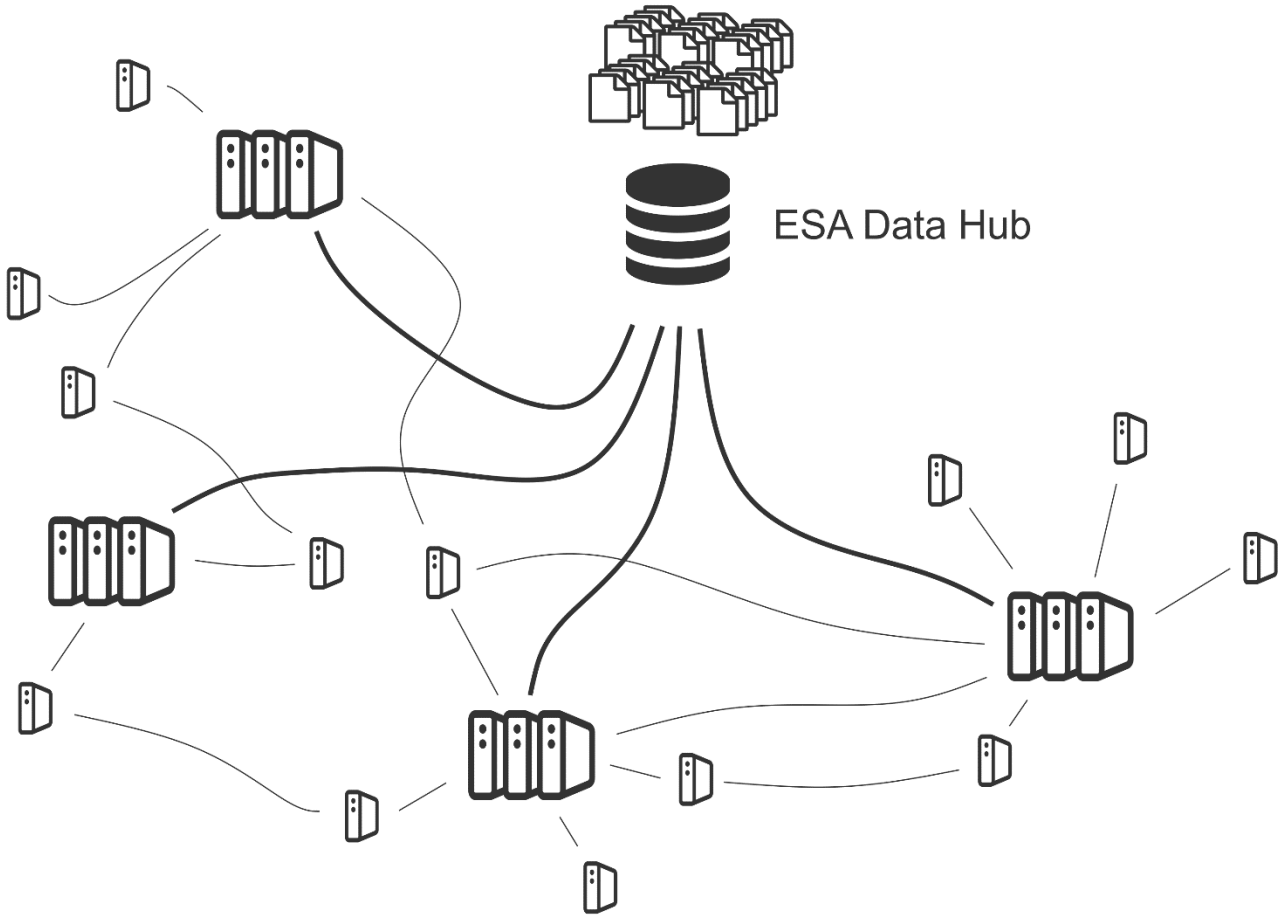



↑40 %
per year
Doubling every
two years
Data Volume
Number of transistors (Moore's law)
Disk
CPU
Bandwidth
↑25 %
per year
800
700
600
500
400
300
200
100
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Years

EO Ground Segment – The Past

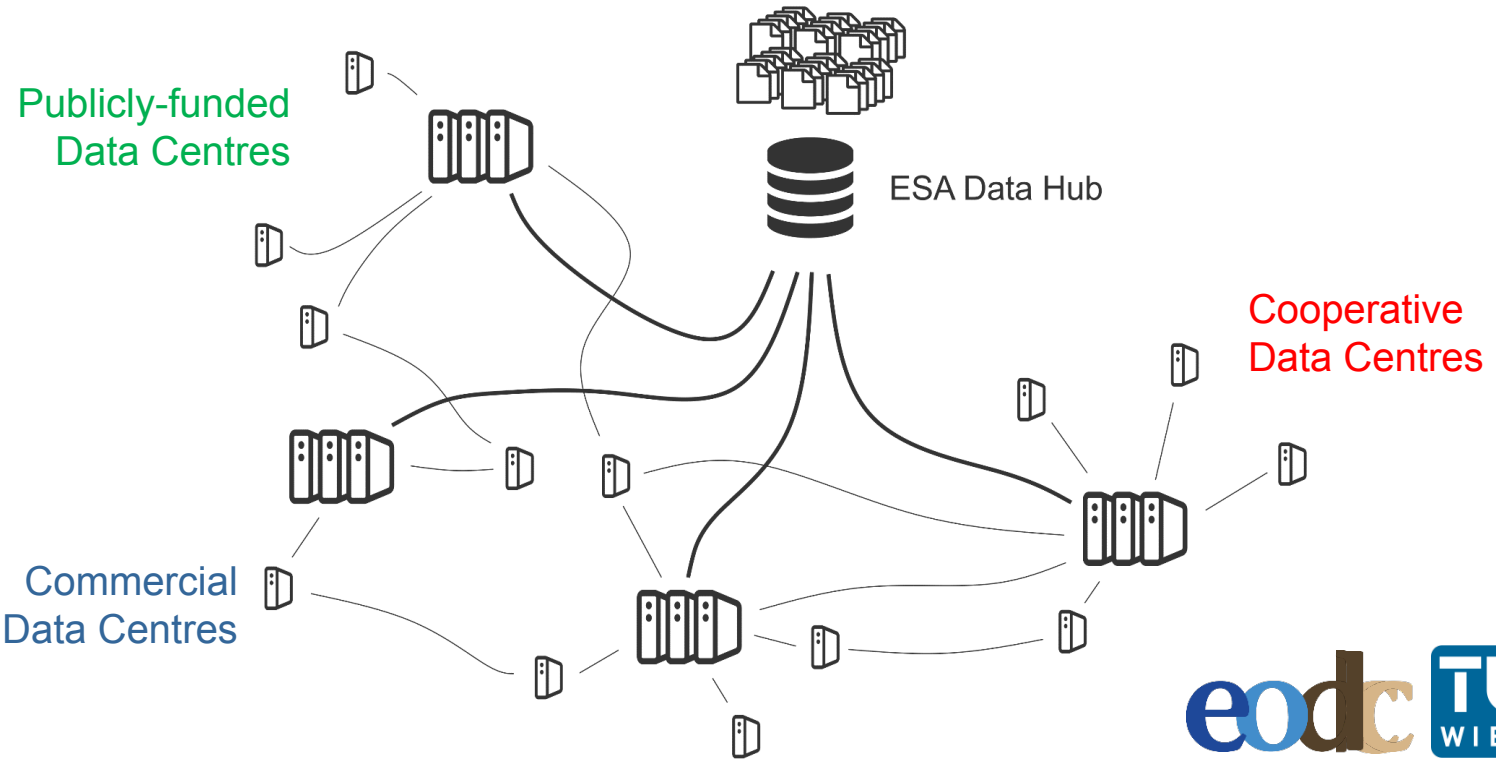


EO Ground Segment – The Future



The Formation of a Network of EO Cloud Platforms

- Reaching a critical mass is essential for user uptake
- How to scale up?
  - Private capital → Google, Amazon, …
  - Public investments → CODE-DE, Copernicus DIAS …
  - Cooperatives → EODC, Supercomputing Centres

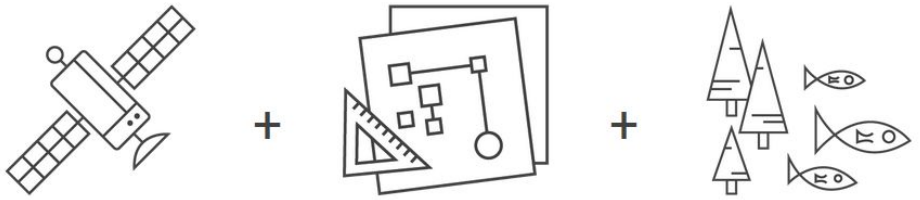


Google Earth Engine https://earthengine.google.com/

FAQ TIMELAPSE DATASETS CASE STUDIES PLATFORM SIGN UP

Meet Earth Engine

Google Earth Engine combines a multi-petabyte catalog of satellite imagery and geospatial datasets with planetary-scale analysis capabilities and makes it available for scientists, researchers, and developers to detect changes, map trends, and quantify differences on the Earth's surface.



Gorelick et al. (2017) Google Earth Engine: Planetary-scale geospatial analysis for everyone, Remote Sensing of Environment 202, 18-27

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Data Access and Information Services (DIAS)

- Copernicus is managed by the EC's Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (DG Growth)

CREODIAS

led by Creotech Instruments S.A.

mundi WEB SERVICES

led by Atos

implemented by esa

ONDA

led by Serco Italia S.p.A.

sobloo

led by Airbus

WEkEO by COPERNICUS

implemented by EUMETSAT, ECMWF and Mercator-Ocean

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Earth Observation Data Centre
Collaboration for Earth Observation

Petabyte Storage
Supercomputing
Cloud Platform

- Public-private partnership
- Building a federated multi-owner IT infrastructure for
  - Scientists
  - Public services
  - Innovators
- Users are partners who participate in decision making
- Development of collaborative services
  - From data to model predictions

https://www.eodc.eu/

Principal Cooperation Partners

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http://www.irpi.cnr.it/

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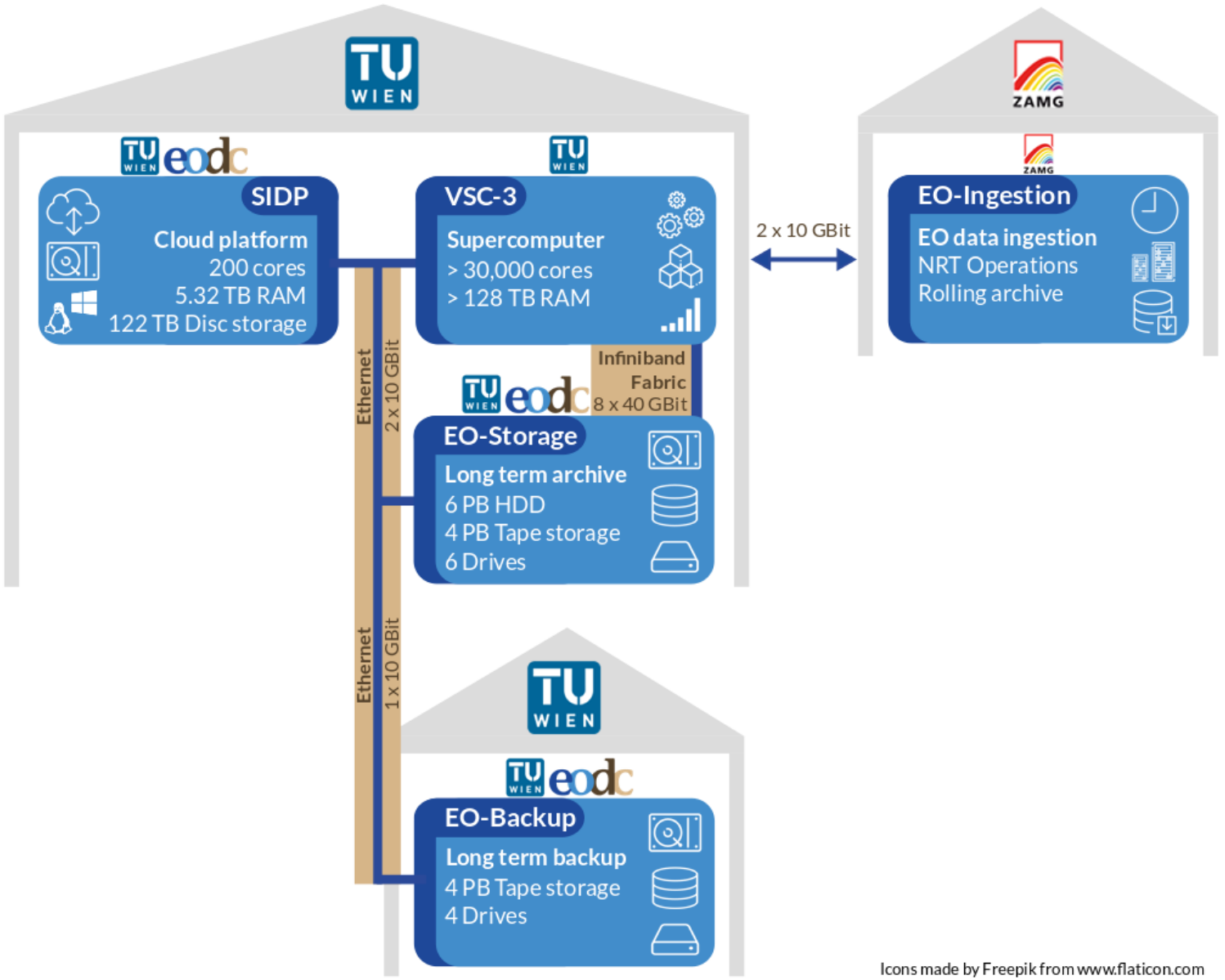
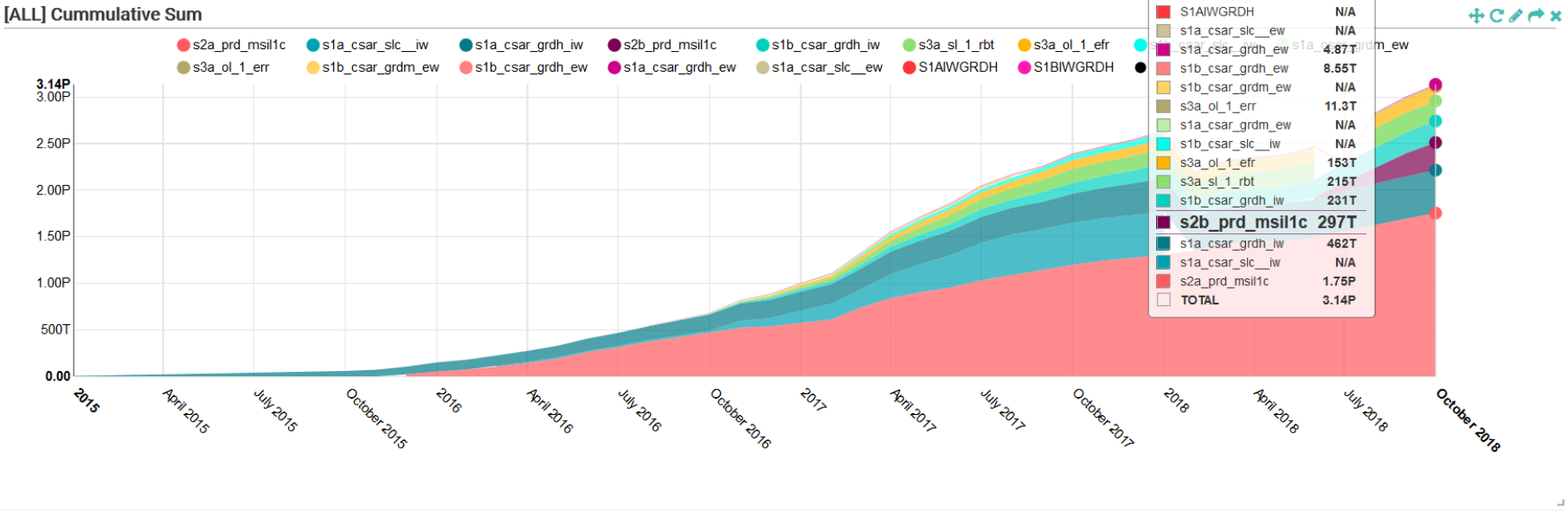
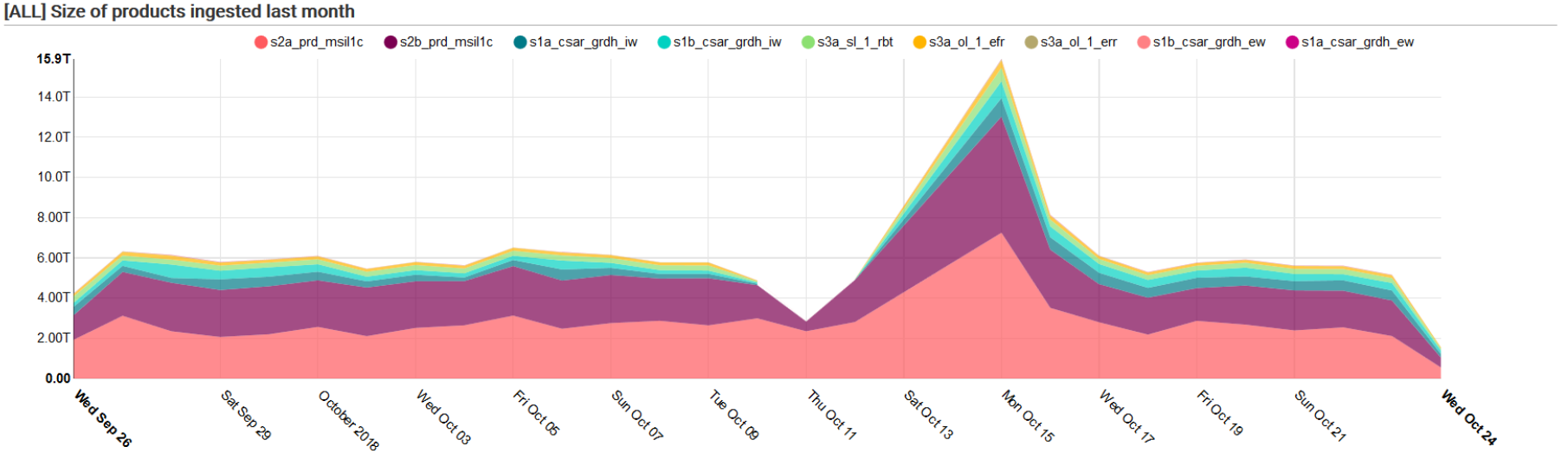
EODC Infrastructure @ TU Wien & ZAMG



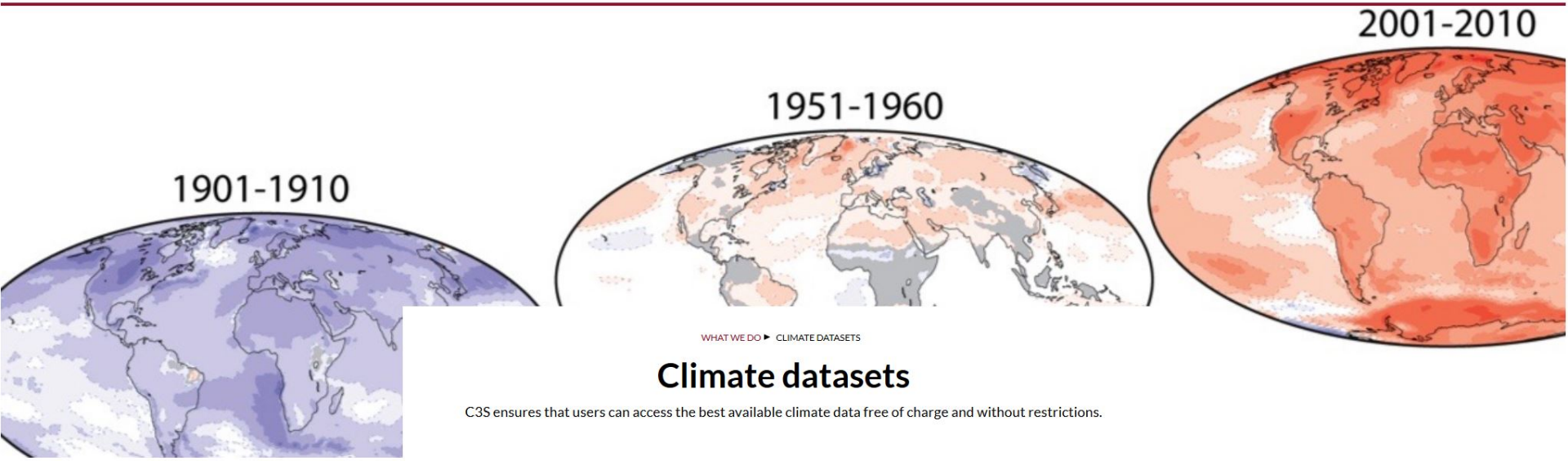
Icons made by Freepik from www.flaticon.com

EODC Data status ☆





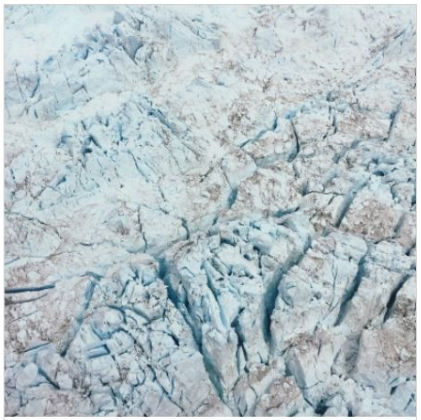
https://eomonitor.eodc.eu/superset/dashboard/datastatus/



Climate datasets

C3S ensures that users can access the best available climate data free of charge and without restrictions.

Observations



Climate reanalyses

Seasonal forecasts

Climate projections

Copernicus Climate Change Service (C3S)
https://climate.copernicus.eu/climate-datasets

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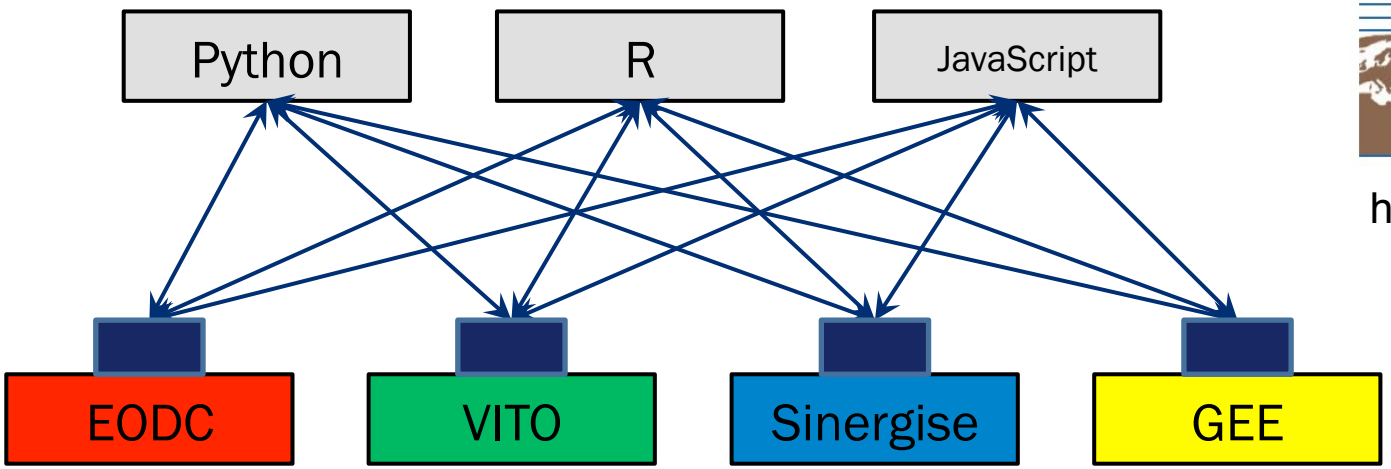
Interoperability of Platforms

- openEO develops an open API to connect R, python, javascript and other clients to big Earth observation cloud back-ends



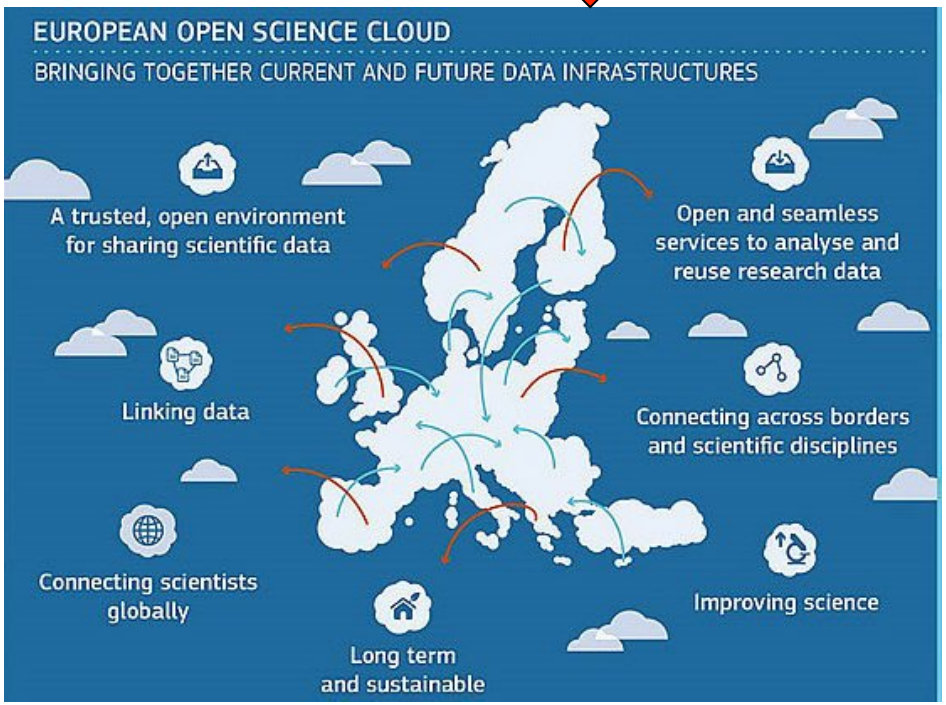
http://openeo.org/

H2020

GitHub https://github.com/open-eo/

Towards the Integrating of Research Infrastructures

- In Earth Observation (EO), nobody can do it all
- Formation of a network of transnational thematic data centres is essential to make best use of the increasing wealth of EO data
- Current EO infrastructure programmes of DG Growth and ESA mainly aim to stimulate industry
- EO science needs its own infrastructures
  - Sovereignty
  - Scientific independence
  - Train next generation of students



Acknowledgements

BMWFW: GEOCLIM Data Infrastructure Austria
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Austrian Space Application Programme: BMon
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H2020: EO-2017 Number 776242 “openEO”