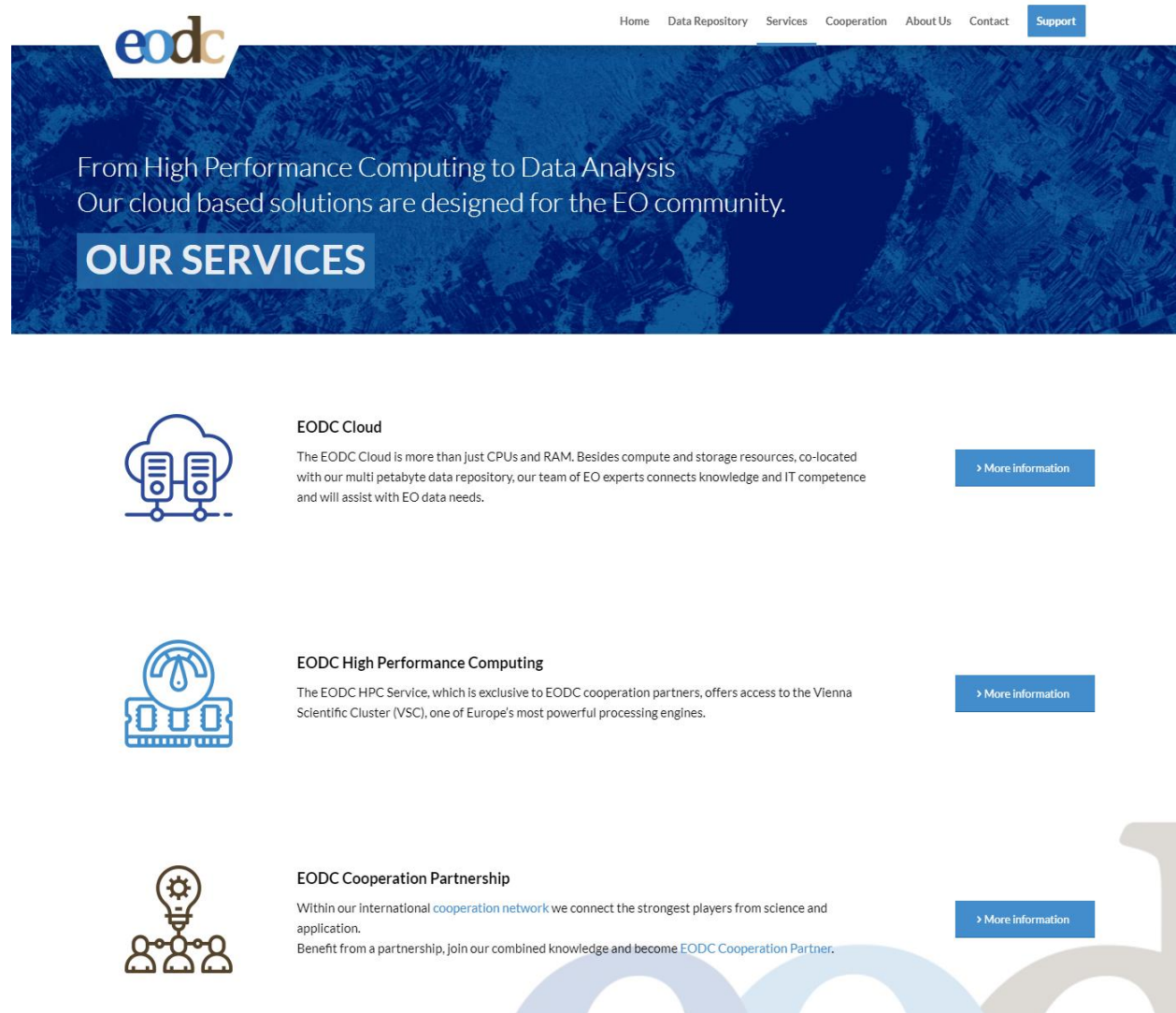


EODC Service Offering

Christoph Reimer & the EODC team
christoph.reimer@eodc.eu



https://eodc.eu/services/




The screenshot shows the EODC website's 'Services' page. At the top, the EODC logo is on the left, and a navigation menu with links for Home, Data Repository, Services, Cooperation, About Us, Contact, and Support is on the right. The 'Services' link is highlighted. Below the navigation is a large blue banner with a satellite image background. The banner contains the text 'From High Performance Computing to Data Analysis Our cloud based solutions are designed for the EO community.' and a white box with the text 'OUR SERVICES'. Below the banner, there are three service cards. Each card has an icon, a title, a description, and a 'More information' button. The first card is for 'EODC Cloud' with a cloud and server icon. The second card is for 'EODC High Performance Computing' with a server rack icon. The third card is for 'EODC Cooperation Partnership' with a lightbulb and people icon. At the bottom of the page, there is a decorative graphic of three overlapping arches in blue and grey.


eodc


Home Data Repository **Services** Cooperation About Us Contact Support

From High Performance Computing to Data Analysis
Our cloud based solutions are designed for the EO community.


OUR SERVICES

 **EODC Cloud**
The EODC Cloud is more than just CPUs and RAM. Besides compute and storage resources, co-located with our multi petabyte data repository, our team of EO experts connects knowledge and IT competence and will assist with EO data needs. [More information](#)

 **EODC High Performance Computing**
The EODC HPC Service, which is exclusive to EODC cooperation partners, offers access to the Vienna Scientific Cluster (VSC), one of Europe's most powerful processing engines. [More information](#)

 **EODC Cooperation Partnership**
Within our international [cooperation network](#) we connect the strongest players from science and application. Benefit from a partnership, join our combined knowledge and become [EODC Cooperation Partner](#). [More information](#)


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EODC Cooperation Partnership

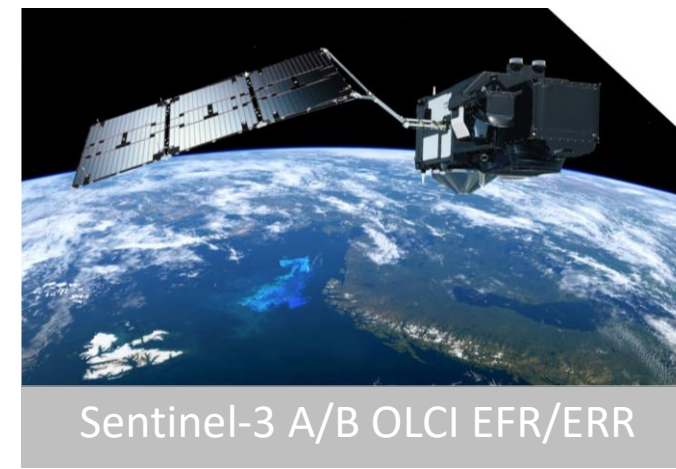
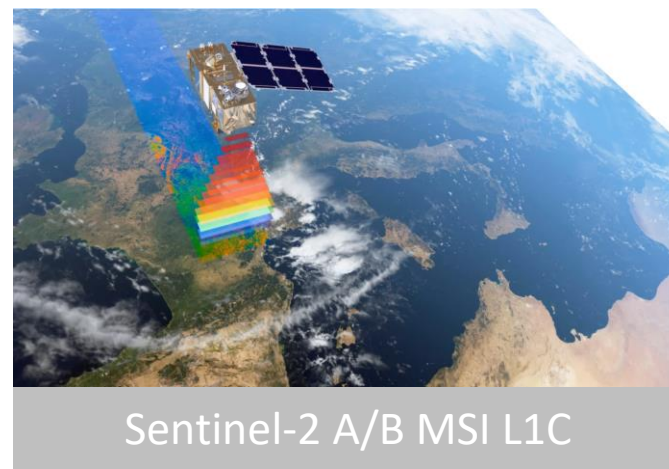
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> More information



EO Data

Copernicus Sentinel Data



Copernicus Data KPIs

14.1 K
products per day

7.53 TB
per day

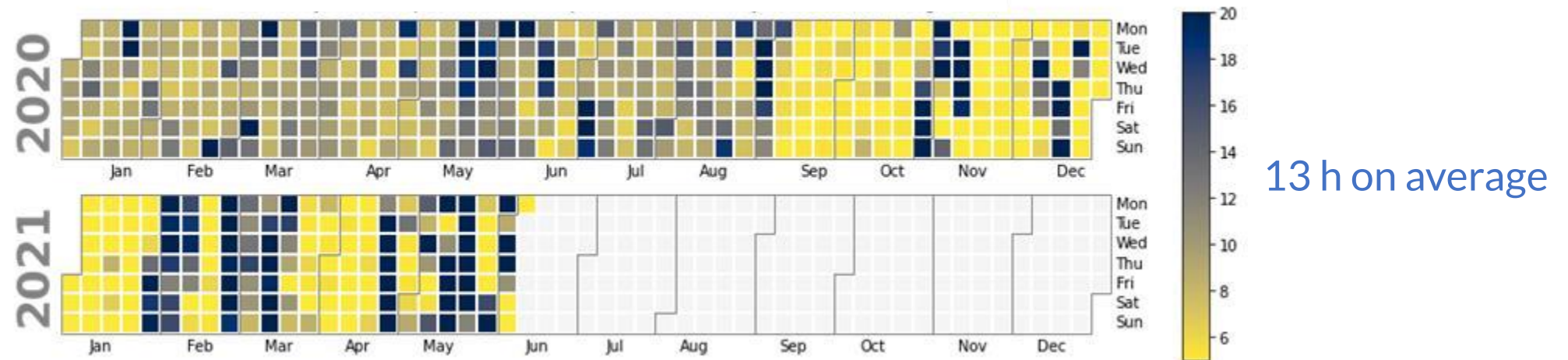
99.9 %
completeness last year

16.2 Mil
products total

9.23 PB
total size

94.3 %
completeness overall

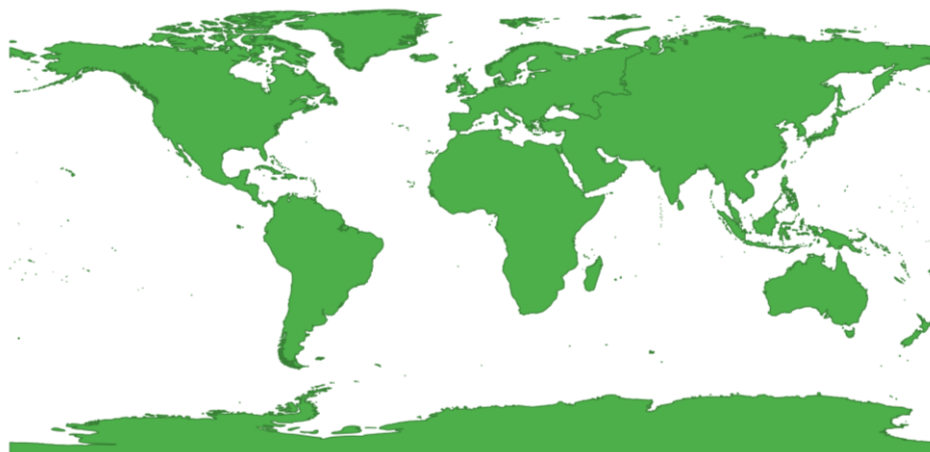
Product Timeliness



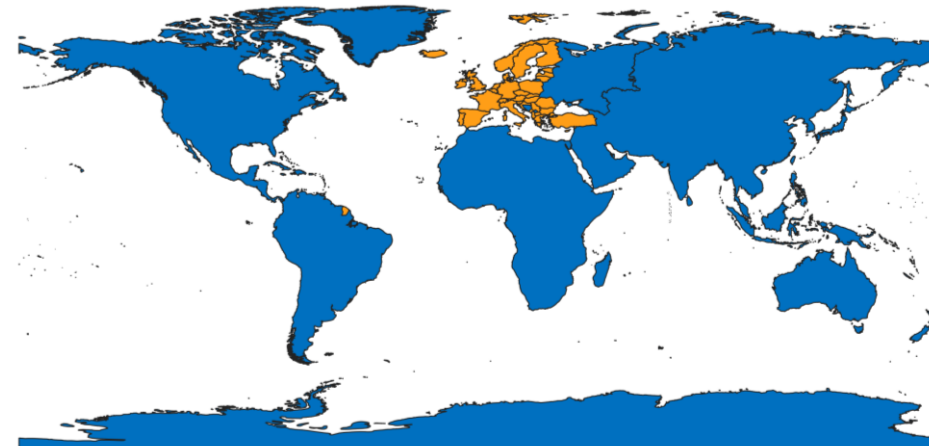
- Main events affecting the timeliness (2021)
 - **2021-02-07 [Hubs]:** Reduced Copernicus Sentinel-1 production rate
 - **2021-03-19 [Hubs]:** Temporary unavailability of Copernicus Sentinel-2 production due to a ground segment anomaly
 - **2021-04-18 [Hub]:** Temporary unavailability of Copernicus Sentinel-2 production due to multiple contingencies that occurred at ground segment level
 - **2021-02-23 [EODC]:** Change of Sentinel-1 NRT-3h and Fast-24h products
 - **2021-04-20 [EODC]:** Issues with Sentinel-2 Data Provision due to unexpected changes to the Sentinel-2 ZIP package format
 - **2021-05-05 [EODC]:** EODC Cloud and Storage Maintenance and resulting unavailability of EO Data Storage

Copernicus Data Migration Policy

Sentinel-1 Last 12 month



Sentinel-2 Last 12 month Last 3 month

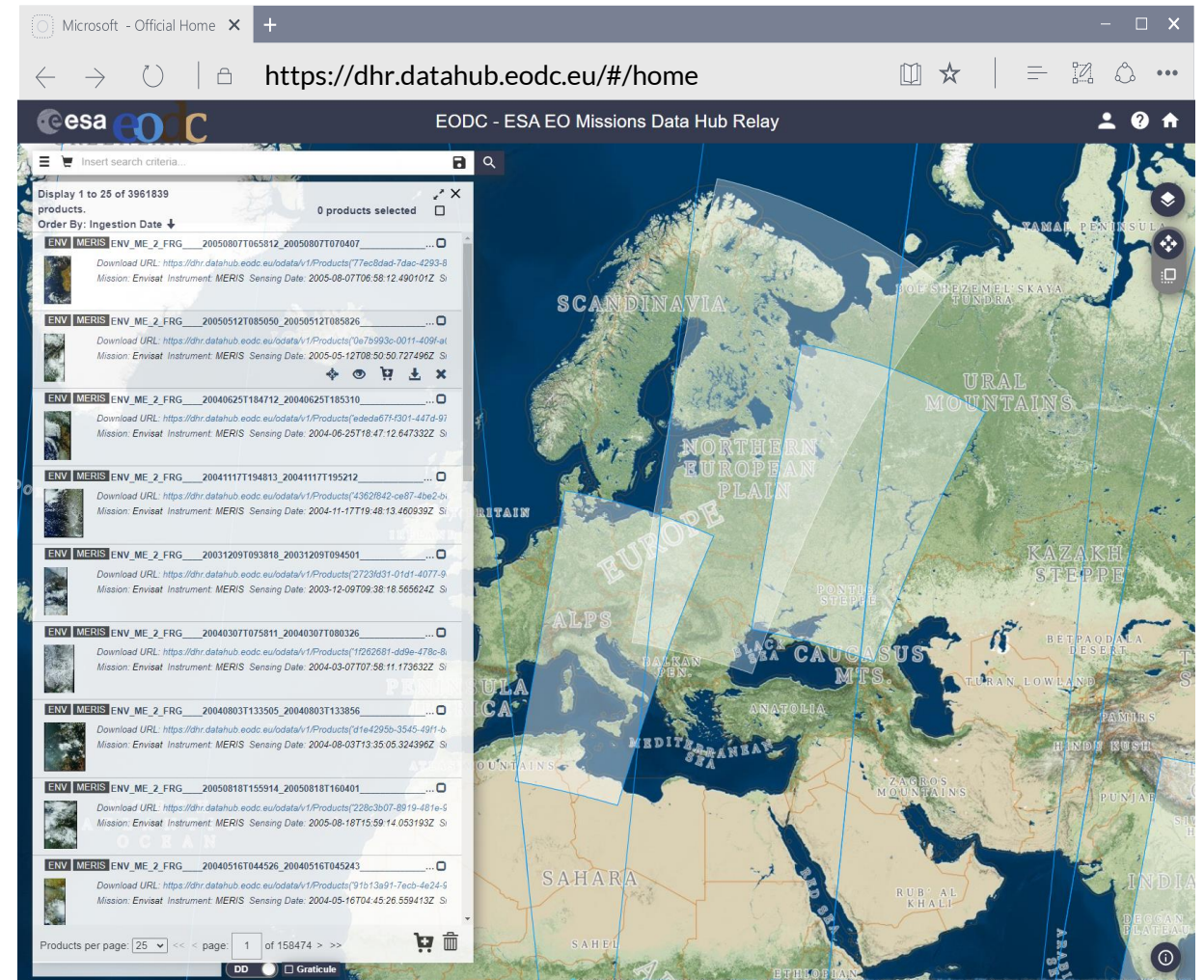


Sentinel-3
Last 3 month



ESA EO Missions DHR

- Data Hub Relay operated by EODC
- Focus on ESA Earth Explorer and other ESA Mission
- Based on Data Hub System (DHuS)
- Same data access interfaces as for Copernicus data
 - ODATA (RESTful API)
 - OpenSearch



DHR data repository

ADM-Aeolus



Dedicated to measure wind profiles

CryoSat



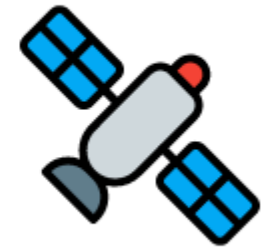
Observing sea-ice and ice sheets from space

Envisat



Continuous observation of the Earth

ERS



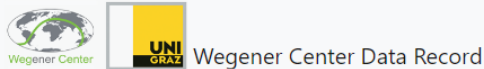
Continuous observation of the Earth

LIVE Missions

- Level-1B HLOS
- Level-2B Rayleigh/Mie wind product
- Level-2 Ice Products [4]
- Level-2 Ocean Products [4]
- Level-2 Ice Fast Delivery NRT [production ended 02/2021]
- Level-2 AATSR LST
- Level-1 ASAR in 3 modes
- Level-2 MERIS in 2 res.
- Level-2 RA products
- Level-2 ASPS20 in 2 res.
- Level-2 RA products
- Level-2 ATSR LST in 2 modes
- Level-1 ATSR

<https://datahub.eodc.eu/>

Data Hosting – GNSS RO



GNSS Radio Occultation Record OPS 5.6 2001–2018

Description

The Wegener Center (WEGC) Global Navigation Satellite System (GNSS) radio occultation (RO) record version OPS 5.6 provides globally distributed upper-air satellite data of high quality from multiple RO satellite missions, usable for climate and other high-accuracy applications.

GNSS RO, where we provide data obtained with the Global Positioning System (GPS), is an active limb sounding satellite technique observing thermodynamic atmospheric variables since 2001. Its properties include high vertical resolution and accuracy, global coverage, long-term stability, and particularly high quality within the upper troposphere and lower stratosphere.

This record comprises individual retrieved profiles for the variables listed below.

Missions

CHAMP, C/NOFS, FORMOSAT-3 COSMIC, GRACE, MetOp, SAC-C

Variables

Bending angle, Refractivity, Temperature, Pressure, Density, Specific humidity, Geopotential height

<https://doi.org/10.25364/WEGC/OPS5.6:2019.1>

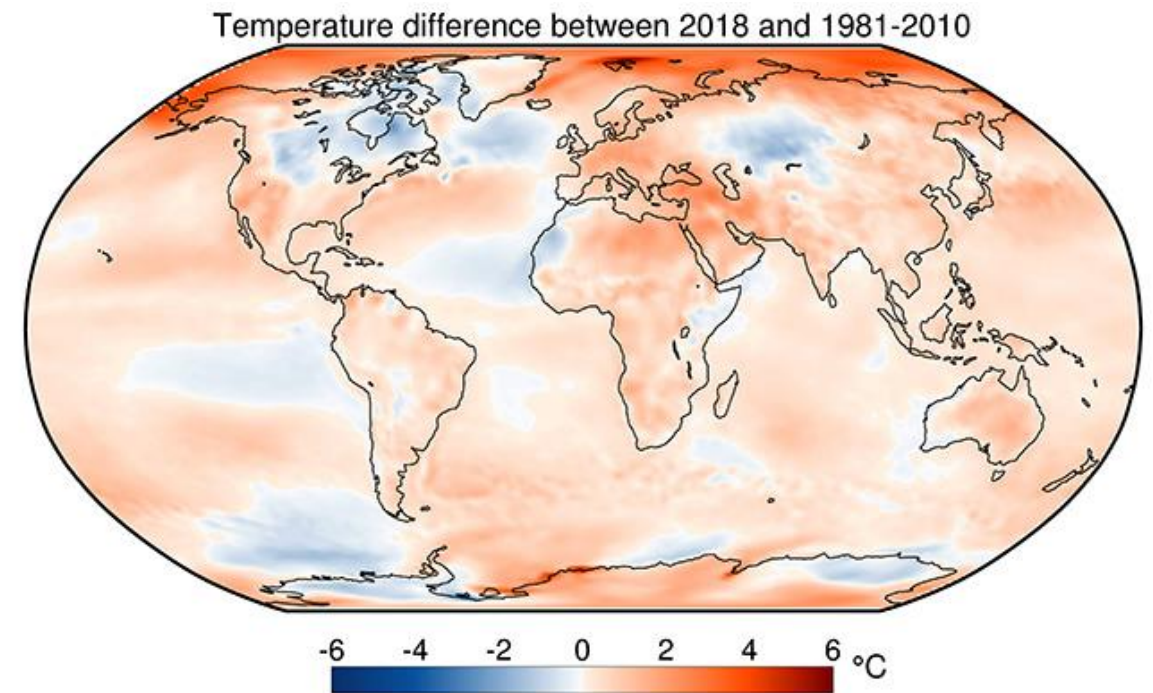


sftp://public:nopassword@wegc.eodchosting.eu/DOIs/WEGC_OPS5.6-2019.1

- Data produced by cooperation partner Wegener Center at Uni Graz
- EODC acting as data host
 - Data management
 - Backup and Archiving
 - Data Access

Data Hosting – ECMWF ERA-5

- Hosting of ERA5 re-analysis datasets to support research activities in respect to Climate Change
- Data acquisition and management on behalf of the GEOCLIM project consortium
- Access via EODC Cloud / HPC service



EODC as data producer


- Together with EODC cooperation partners through funded projects
- Partners bring expertise in product retrieval via algorithms
- EODC enables access to compute and storage infrastructure (EODC service offering)
- EODC implements the data production chain based on inputs of the partners
- EODC operates, maintains data production chain (data management, monitoring, backups) and provides data dissemination channels
- 3 operational data production services for Copernicus
 - Global Land Service
 - Climate Change Service
 - Global Flood Monitoring

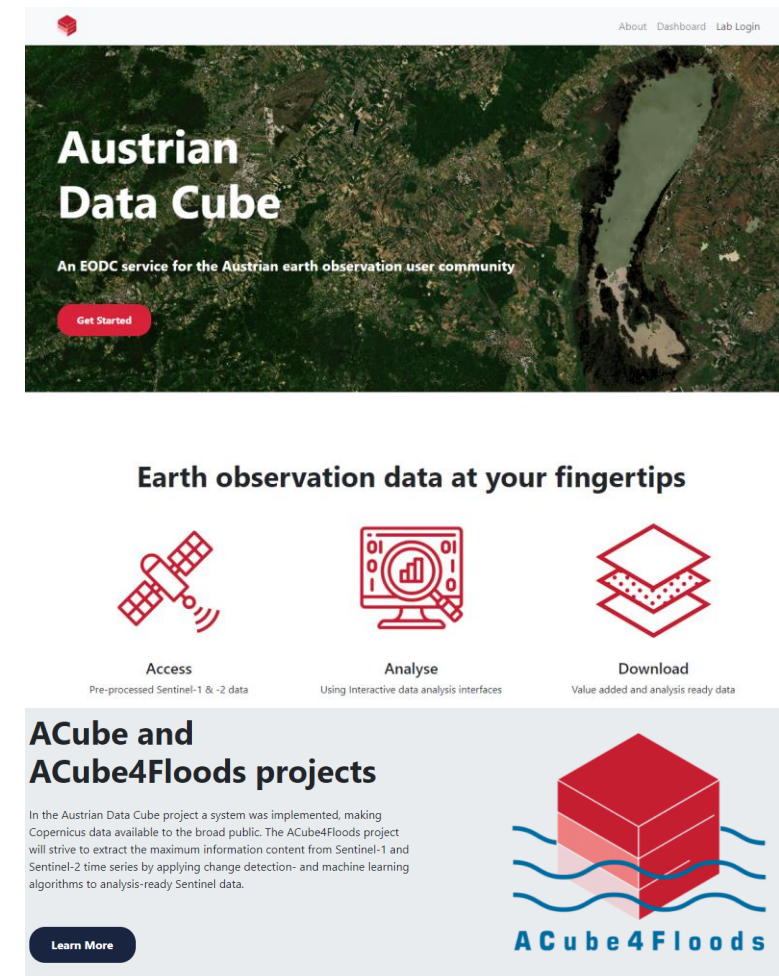
presentations on Day 2 - Block 1

Analysis Ready Data and Data Cubes

- What is Analysis Ready Data?
- Common steps to produce ARD
 - Search, download and manage data
 - Resampling of data to a common grid
 - Apply corrections/conversions and data masking
 - Radiometric calibration ('co-registration')
 - Metadata creation [common and per pixel]
- Why do we think ARD is important?
 - Enable non-EO experts to work with the data
 - Foster data interoperability to increase information density (more applications)
- Data Cube concept to represent ARD

EODC Data Cube Activities

- Initial FFG funded project “ACube”
 - ARD data over Austria provided by partners BOKU and TUW GEO
 - 2 Sentinel-1 and 12 Sentinel-2 collections over Austria [Equi7Grid]
 - Based on  **OPEN DATA CUBE**
<https://www.opendatacube.org/>
 - Data access via ODC Python API in hosted JupyterLabs
- Support follow-up project “ACube4Floods”
 - Change detection and machine learning on ARD
 - Combine ARD with weather and mobile movement data



The screenshot shows the 'Austrian Data Cube' website. At the top, there's a navigation bar with 'About', 'Dashboard', and 'Lab Login'. The main header features a satellite image of a river and the text 'Austrian Data Cube' with a subtitle 'An EODC service for the Austrian earth observation user community' and a 'Get Started' button. Below this, a section titled 'Earth observation data at your fingertips' contains three icons: a satellite for 'Access' (Pre-processed Sentinel-1 & -2 data), a computer monitor with a bar chart for 'Analyse' (Using interactive data analysis interfaces), and a stack of data layers for 'Download' (Value added and analysis ready data). The bottom section is titled 'ACube and ACube4Floods projects' and includes a paragraph about the project's goals and a 'Learn More' button. To the right of the text is a logo for 'ACube4Floods' featuring a red cube and blue wavy lines.

openEO API

Details and Demos on Day 3

- Standardised REST API to enable data access and processing across multiple EO data infrastructure providers
- Started as Horizon 2020 research project, now in development to an ESA funded operational service “openEO Platform”
 - API implementation based on Data Cube concept “multidimensional arrays”
 - Serverless computing paradigm, remote execution without the need to provision resources
 - Run your workflow on multiple backends (infrastructure providers)
- EODC openEO Backend [<https://openeo.eodc.eu/>]
 - Transition to incorporate ARD via bindings to Open Data Cube Python API
 - Enable HPC processing via openEO API



ARD strategy at EODC

- Move away from file-based data access to cube based data access (spatial and temporal dimensions)
- How we are doing that?
 - Build on Open Data Cube ecosystem
 - Integration of further data cubes to the already existing ones
 - Increase compute cluster resources available for data cube operations
 - Enhance interoperability with openEO API and the openEO Platform
- Make ARD more visible and accessible by utilising STAC and the STAC API
- Support multiple interfaces to interact with the data
 - openEO API, Python API [JupyterLab], pre-defined dashboards, WMTS/XYZ, etc.



Sentinel-1 ARD Collections

- Joint initiative with partner TUW GEO
 - Generation of Sentinel-1 ARD data with regular collections updates (< 24h)
- Global ARD Collections for
 - Sentinel-1 Monthly Aggregated Composites at 10m
 - Sentinel-1 orbit-averaged Projected Local Incidence Angle (PLIA) at 10m and 20m
 - Sentinel-1 SIG0 at 20m
- Enable access via openEO API and ODC Python API

presentation Day 1 - Block 2



Roadmap

- Improve timeliness and QC of Copernicus Sentinel data stream
- Enhance or maintain operations of the Copernicus data production services
- Further evolve the provisioning of additional ARD as data cubes
 - Collections from EODC partners, Copernicus Climate Data Store, EUMETSAT HDA, Sentinel-2, etc.
- Contribute to the development of the openEO Platform

Question / Comments

info@eodc.eu

Break-out session in the evening (Comments and Discussion)
[16:40 – 17:00]