EOSC-hub

ENES Climate Analytics Service (ECAS)

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The European Open Science Cloud

https://eosc-portal.eu - https://www.eosc-hub.eu

EOSC-hub

- EOSC-hub H2020 project:
  - Provides the EOSC portal and relevant processes
  - Common services (EUDAT, EGI, Indigo)
  - Training activities
  - ECAS is part of WP7: Thematic Service development
    - Time frame: M01-M18 plus extension

Motivation

- Traditional approach to data analysis relies on data downloads and using local analysis tools
  - Data are now too huge to download
  - Data sharing and re-use are strongly desirable

- ECAS provides a server-side data analysis environment
  - Computationally powerful: Ophidia analytics framework
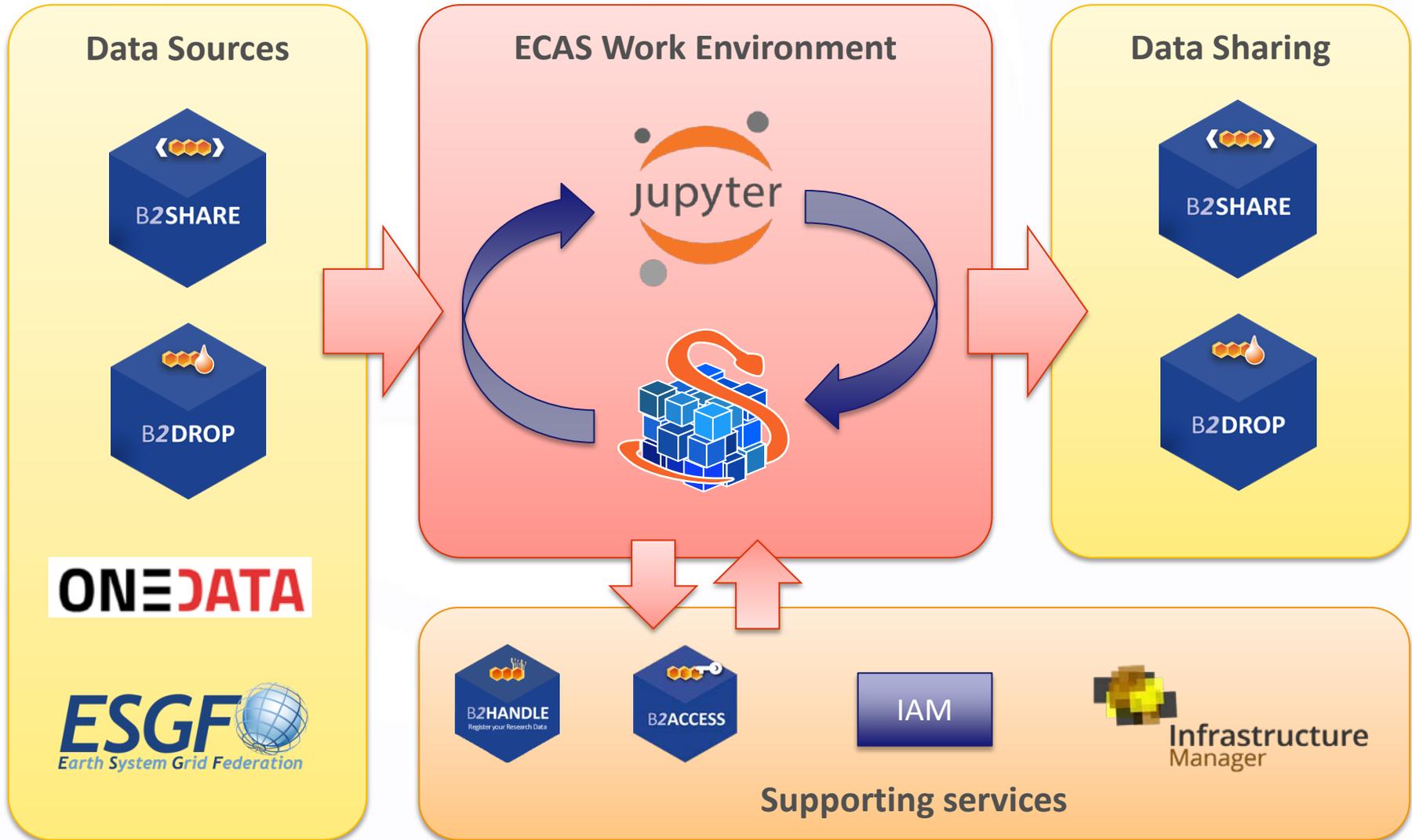 - Easy to use: Jupyter notebooks and data sharing services

Service architecture and interfaces

Service access

- Users can register and log-in at the ECAS instances:
  - CMCC: https://ophidialab.cmcc.it/
  - DKRZ: https://ecaslab.dkrz.de/
- Users can develop Jupyter notebooks with Python
  - **Bring your own data:** direct upload or use B2DROP
  - Share your workflows via the ECAS workflow repository
- Alternative access via the Ophidia terminal is possible
  - Provides execution options for shared workflows
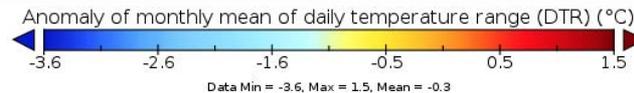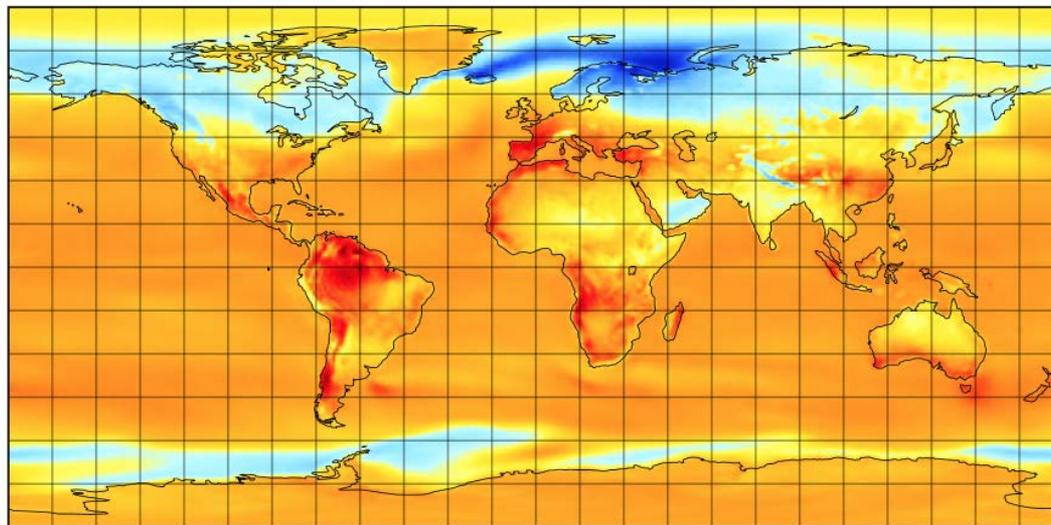
Service options and attributes

- DKRZ and CMCC are the current service providers for ECAS

- The two instances can be used by users after registration
  - The instances differ in the choice and amount of local data provided. Please refer to individual site documentation for details.

- A github repo has been set up to share Python applications and analytics workflows at https://github.com/ECAS-Lab

Featured use case (I): Climate data analysis

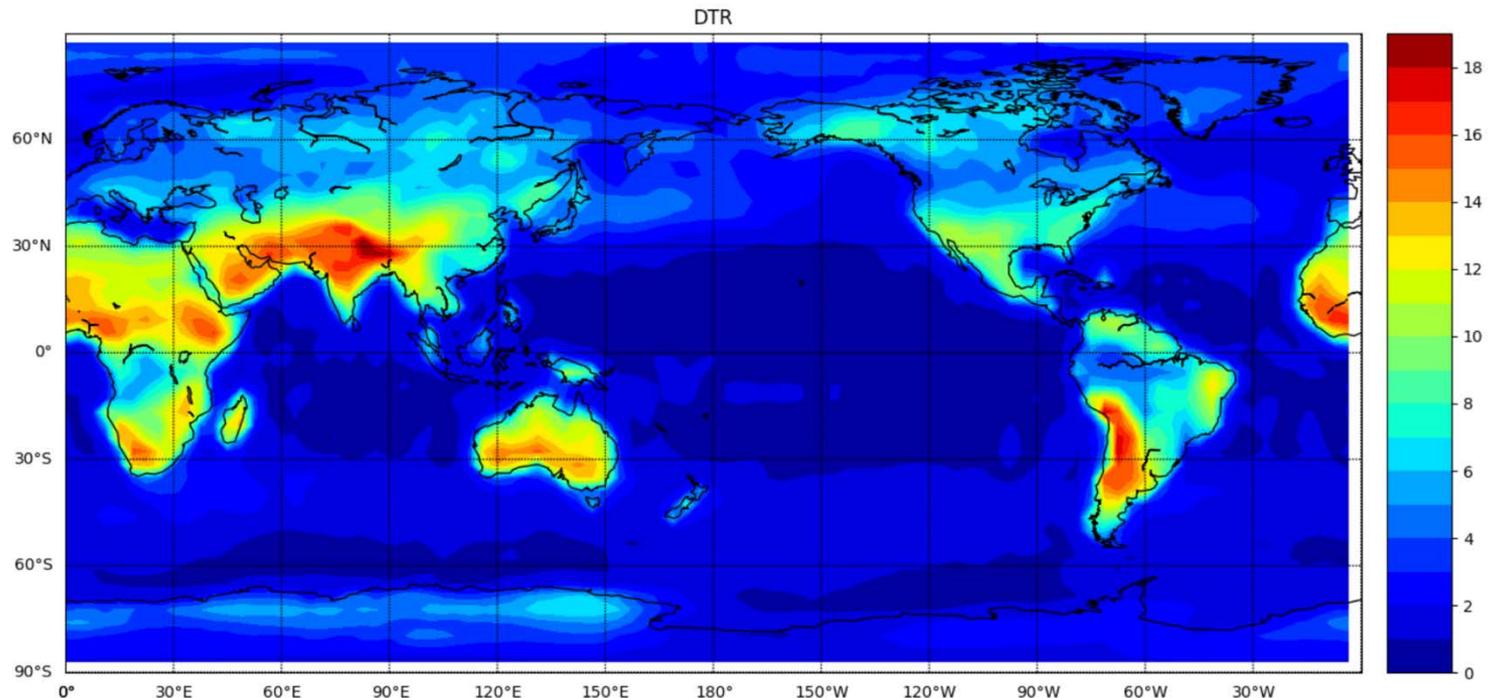- *Climate index calculations*
  - *e.g., length of snow season, monthly temperature averages, precipitation trend analysis, number of tropical nights*

Anomaly of monthly mean of daily temperature range (DTR)

Anomaly of monthly mean of daily temperature range (DTR) (°C)

-3.6   -2.6   -1.6   -0.5   0.5   1.5

Data Min = -3.6, Max = 1.5, Mean = -0.3

Featured use case (II): A complete workflow for computation, viz and sharing of a climate indicator

Integration activity ECAS/B2DROP

Additionally, the integration of B2DROP in PyOphidia allows to export, with a single line of code, the data inside a datacube directly into your B2DROP space in NetCDF format. To do so on the *monthlyDTR* ... acube computed in the previous step, you can run the following line. It could not be easier than this!

In this case the *dtr.nc* previously up... ...be overwritten by this new version.

```
In [ ]:  monthlyDTR.to_b2drop()
```

What does this mean for ESGF?

- ESGF-hosted data (also beyond CMIP6) available for processing with EOSC resources in the future

- New user groups for ESGF data

- Contribution to compute team discussions in ESGF

- Further integration with EOSC important in frame of IS-ENES 3

ECAS on the marketplace

- For more information, visit the EOSC portal/marketplace:

  - https://marketplace.eosc-portal.eu/services/enes-climate-analytics-service

Thank you for your attention!

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Questions?

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