

Open Data Cubes Cloud-Computing Web Processing Services

data management for sustainable development

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¹GIZ - Regional Project Central Africa, COMIFAC

²FOSS4G Community (OpenDataCubes, birdhouse, PAVICS, etc...)

28 Juni 2018



Content

1 Introduction

2 Political Discourse

3 Technical Aspects

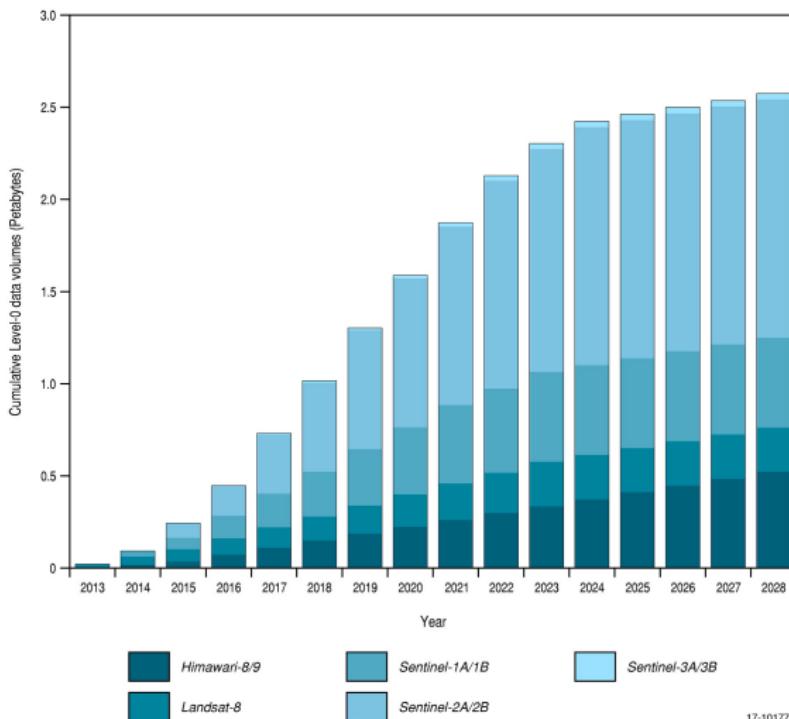
4 Examples



Need of action



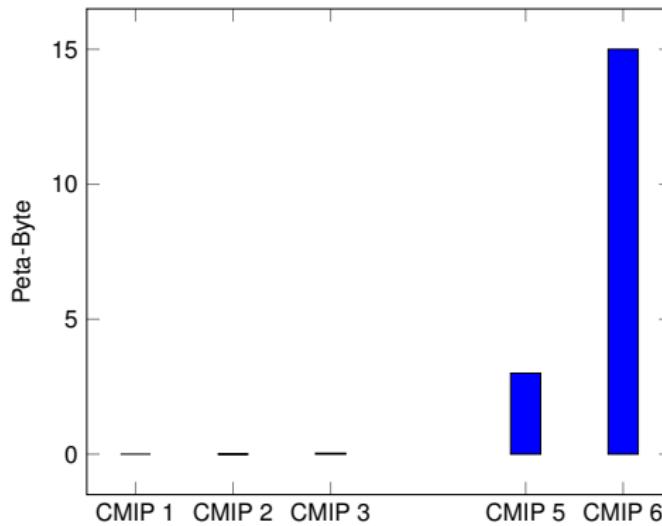
Predicted EO-data availability for Australia



17-10177-1



Global Climate Model Data Availability



CMIP 1 : 1 GB
CMIP 2 : 500 GB
CMIP 3 : 35 TB
CMIP 4 : Not existing
CMIP 5 : 3.5 PB (multi-model archive)
CMIP 6 : currently 10-20 PB as "ESGF" Data (real existing 10time more)

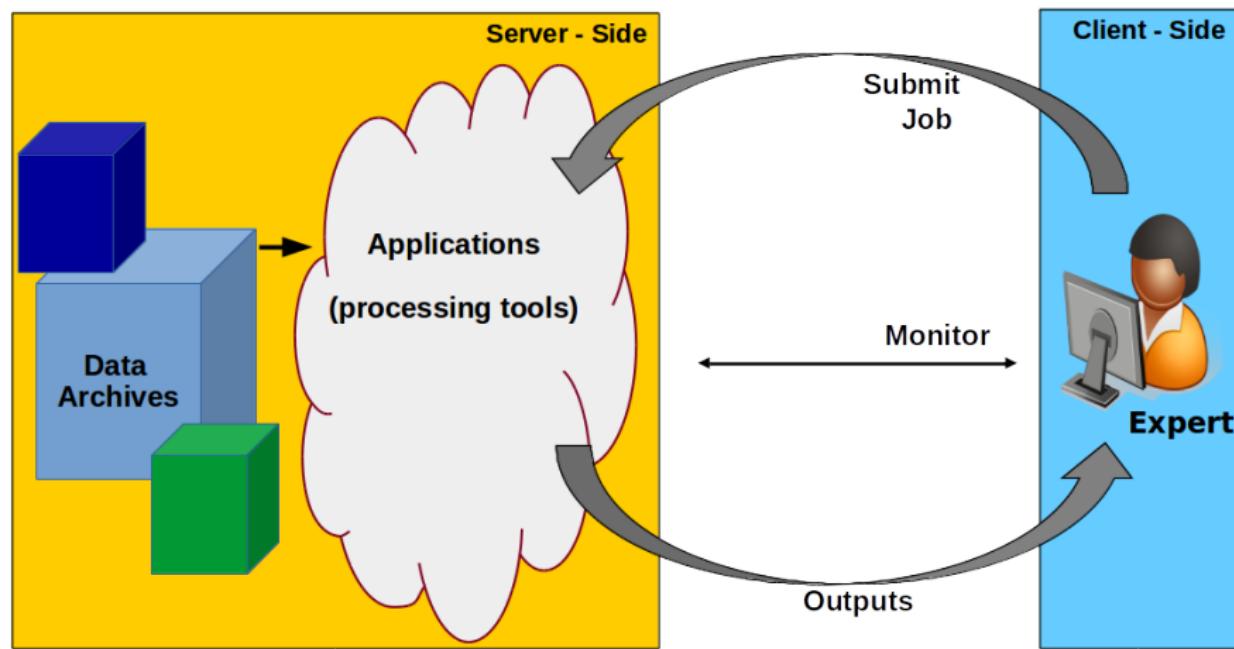
IPCC 1 : 1990
IPCC 2 : 1995
IPCC 3 : 2001
IPCC 4 : 2007
IPCC 5 : 2014
IPCC 6 : -> 12-16 April 2021

Global Land Outlook : 2017
(Report UNCCD)

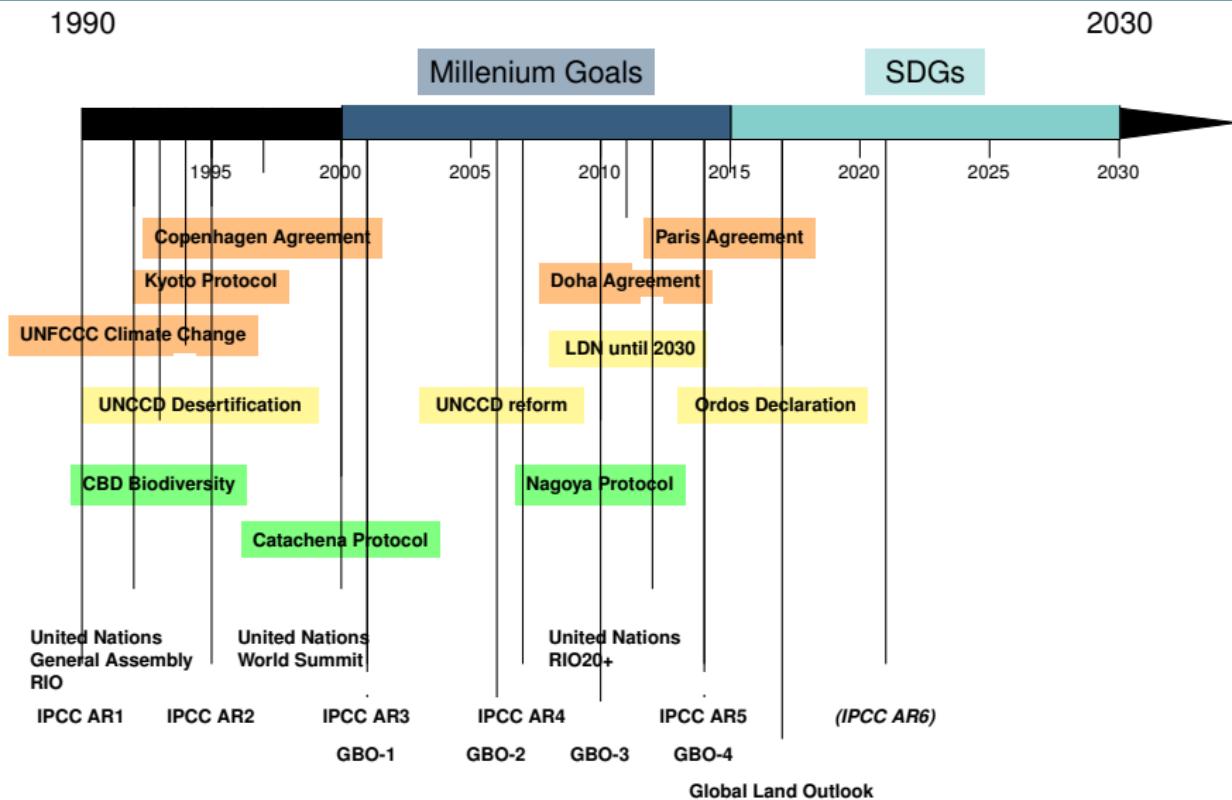
CMIP = Coupled Model Inter-comparison Project
IPCC = Intergovernmental Panel of Climate Change



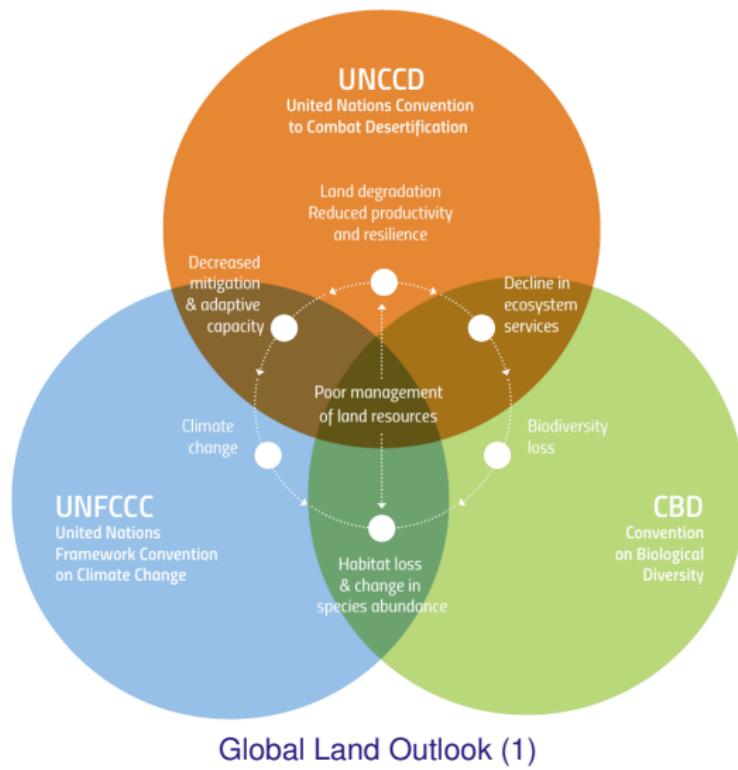
Remote Data Processing



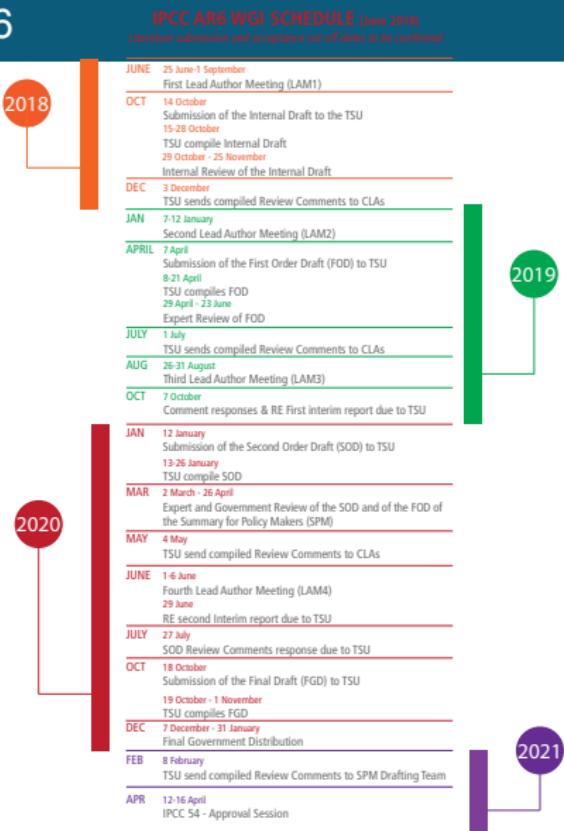
Political discourse



Rio Conventions



Roadmap IPCC AR6



High Performance Computation for Sustainable Development



FIGURE – High Performance Computer



FIGURE – Sustainable Development Goals

Further reading :

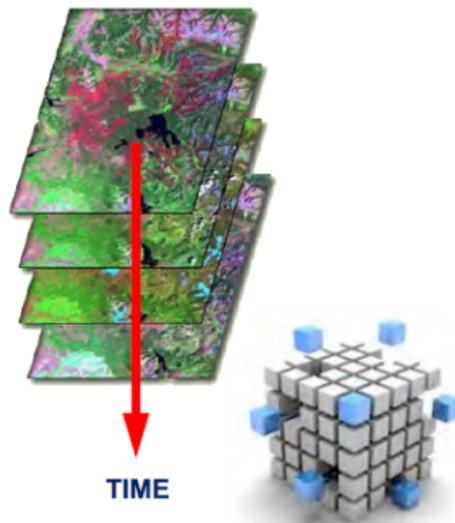
Cyber-structures for sustainable development
The IT Landscape for Climate Services



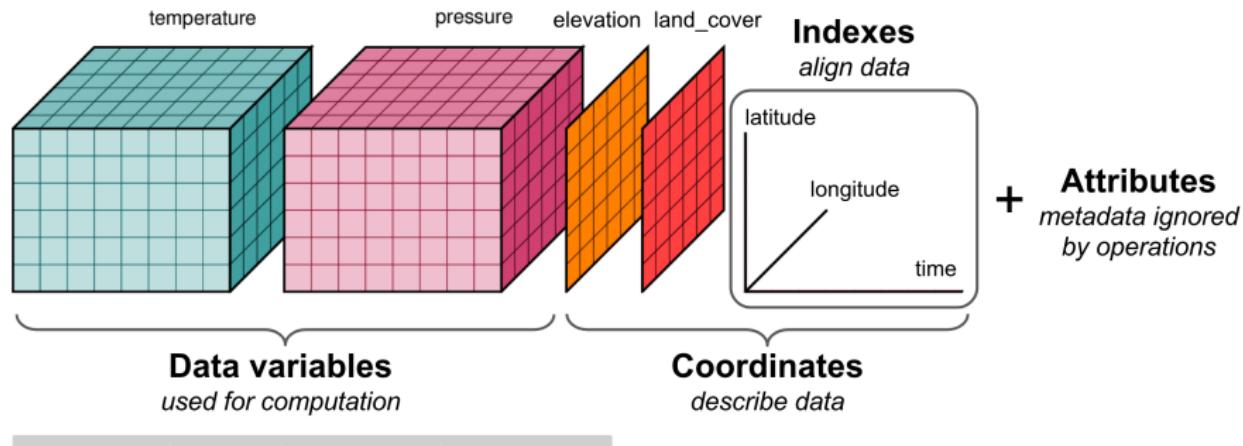
Open D

What are Data Cubes?

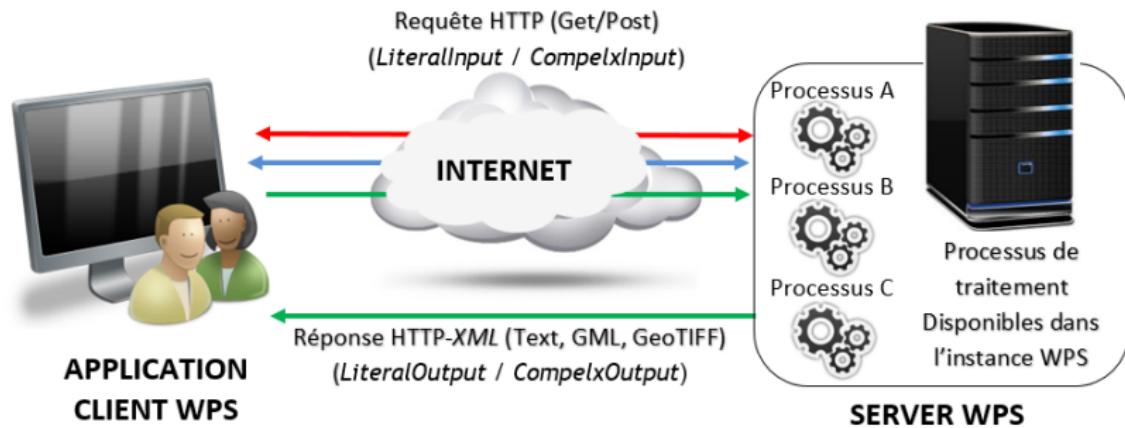
- **Data Cube** = Time-series multi-dimensional (space, time, data type) stack of spatially aligned pixels ready for analysis
- **Proven concept** by Geoscience Australia (GA) and the Australian Space Agency (CSIRO) and planned for the future USGS Landsat archive.
- **Analysis Ready Data (ARD)** ... Dependent on processed products to reduce processing burden on users
- **Open source** software approach allows free access, promotes expanded capabilities, and increases data usage.
- **Unique features:** exploits time series, increases data interoperability, and supports many new applications.



Network Common Data Format (netCDF)



Web Processing Services



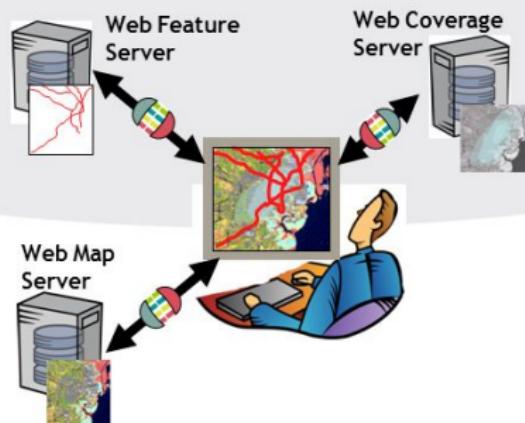
- Légende :**
- ↔ Le client envoie une requête **GetCapabilities** et le serveur répond (Liste des processus A, B, C)
 - ↔ Le client sélectionne un traitement processus C, une requête **DescribeProcess** est envoyée et le serveur répond (Entrées & sorties du processus C)
 - ↔ L'utilisateur choisit les entrées nécessaires et lance le traitement, une requête **Execute** est envoyée et le serveur répond par un document XML initial.



OGC Standard

OGC Web Services (OWS)

The geospatial web is enabled by OGC standards:

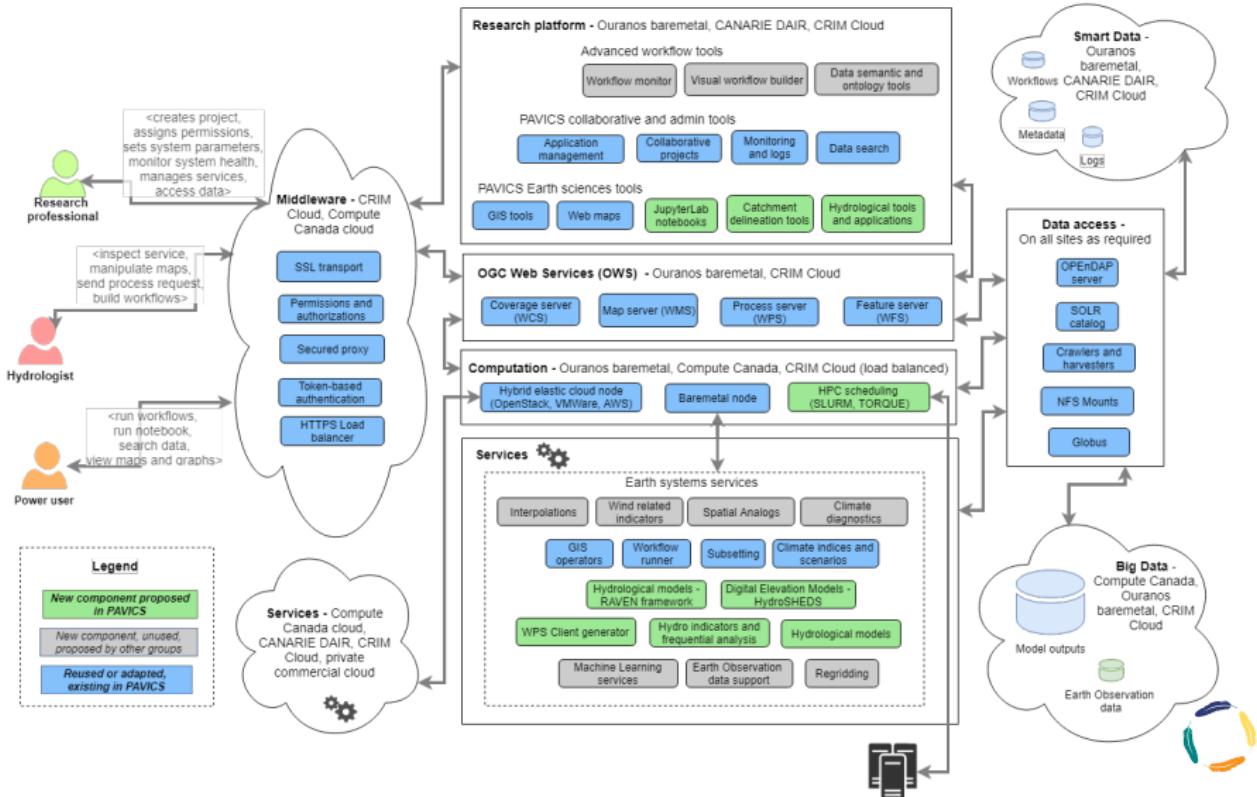


- Web Map Service (WMS)
- Web Map Tile Service (WMTS)
- Web Feature Service (WFS)
- Web Coverage Service (WCS)
- Catalogue (CSW)
- Geography Markup Language (GML)
- KML
- Others...

Relevant to geospatial applications: Critical Infrastructure, Emergency Management, Weather, Climate, Homeland Security, Defense & Intelligence, Oceans Science, etc

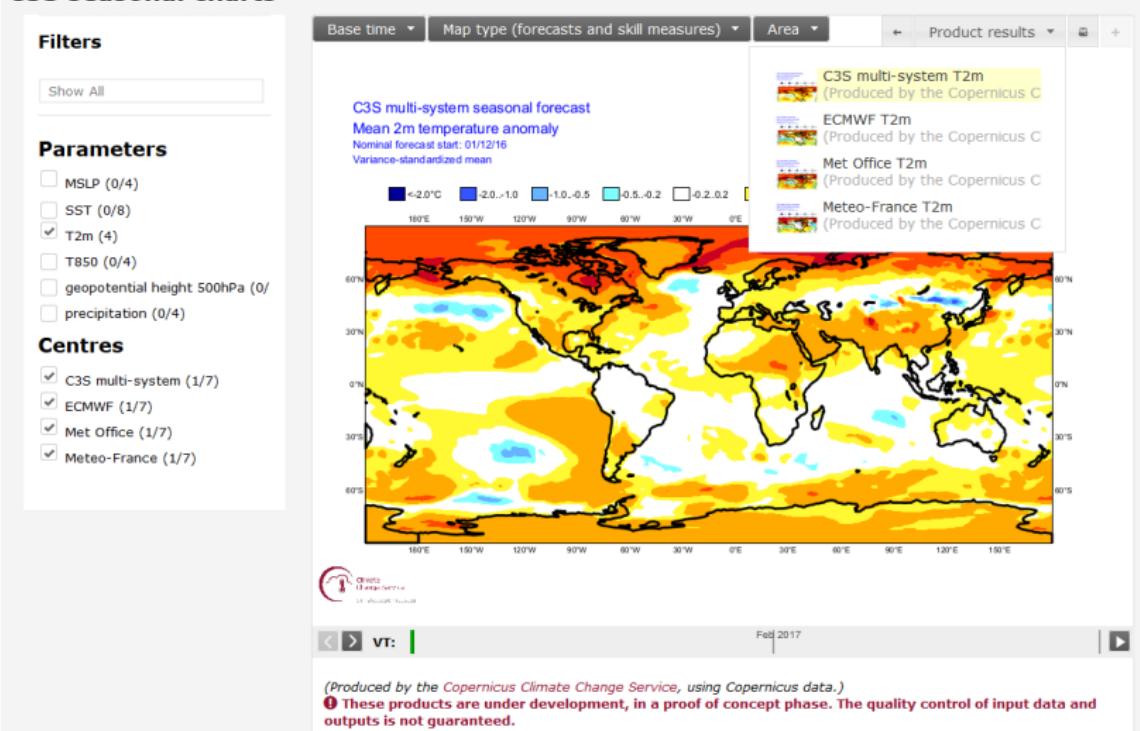


Birdhouse-PAVICS framework



COPERNICUS C3S

C3S seasonal charts

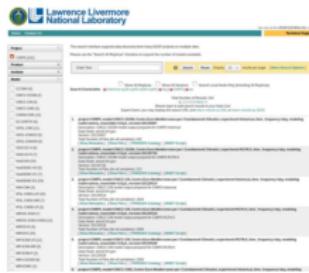


Copernicus Climate Change Service

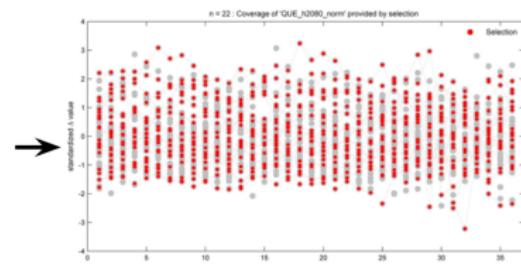
PAVICS :

A Platform for the Analysis and Visualization of Climate Science

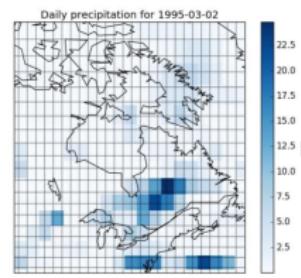
Data search & acquisition



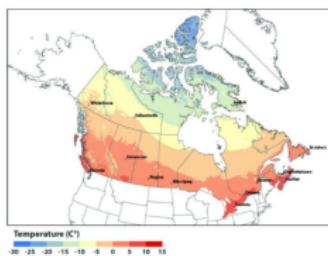
Selection of an ensemble of simulations



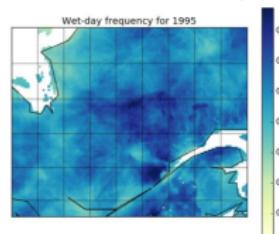
Subsetting



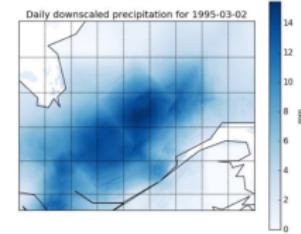
User specific visualization



Climate indicator computation



Downscaling



<https://www.researchgate.net/project/PAVICS>

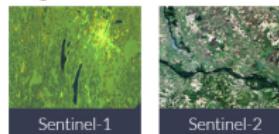
CODE-DE

The screenshot shows the main navigation bar with "DEUTSCH" and "ENGLISH" buttons, "REGISTEREN" and "ANMELDEN" buttons, and links for "ÜBER CODE-DE", "AKTUELLES", and "HILFE". Below the navigation is the large "CODE-DE" logo with the subtitle "COPERNICUS DATA AND EXPLOITATION PLATFORM - DEUTSCHLAND".

Die Copernicus Data and Exploitation Platform – Deutschland (CODE-DE) ist der Nationale Copernicus Zugang für die Satellitendaten der Sentinel-Satellitenreihe und die Informationsprodukte der Copernicus Dienste.

[weiterlesen >](#)

Ausgewählte Inhalte



TOOLS

PROJECTS

PROCESSORS

Aktuelles

31. Januar 2017 - 9:15
Improved Availability of Sentinel 2 Data on CODE-DE

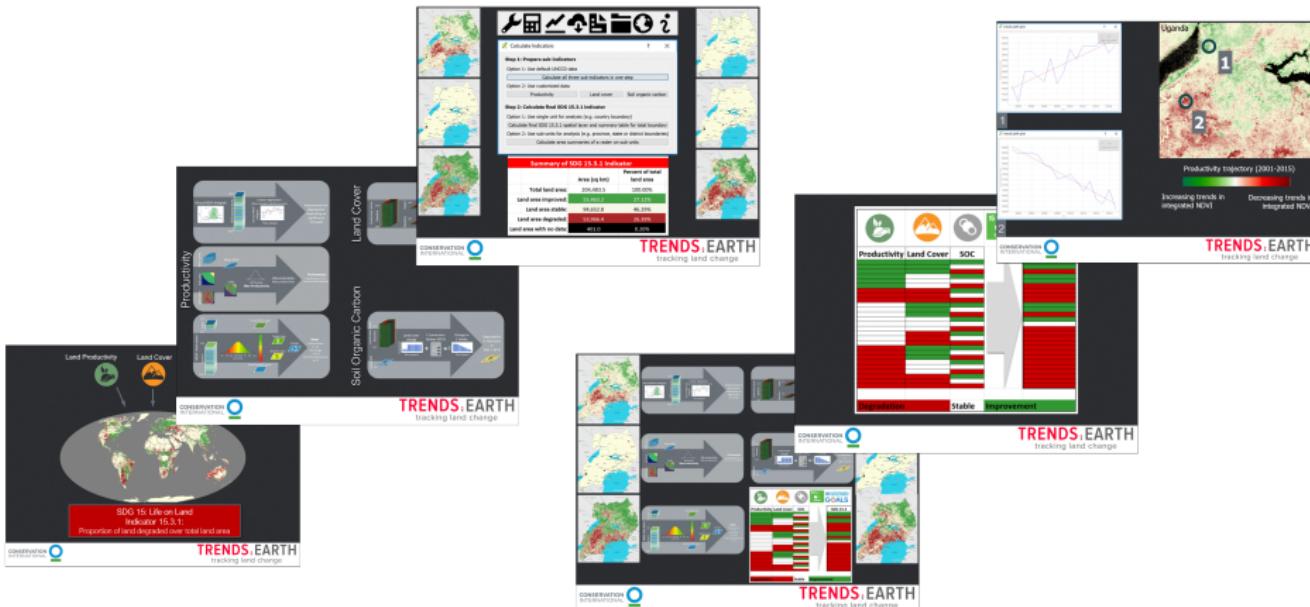
23. Januar 2017 - 7:15
User Tools for CODE-DE auf github veröffentlicht

11. Januar 2017 - 15:15
Datenverfügbarkeit von Sentinel 2 auf CODE-DE

code-de.org



Trends.earth QGIS plugin (UNCCD LDN → SDG 13.5.1)



link to Documentation Trends.Earth
link to Tutorial Trends.Earth



ODC

20 data cubes by 2020 – (plus ARDC)



26 | SDG, LDN, ODC, AP etc | Neil Sims

**opendatacube**[Link: African Regional Data Cube Announcement](#)**Video Links :**[Africa Regional Data Cube](#)[How the Data Revolution is Shaping Africa's Future](#)

Ingredients of the recipe for data for SDGs

