http://climate4impact.eu/

Bridging SPECS, CMIP5 and CORDEX data to impact users

Maarten Plieger, Wim Som de Cerff, Ernst de Vreede, Christian Pagé, Natalia Tatarinova, Antonio Cofiño, Manuel Vega Saldarriaga, Ronald Hutjes, Fokke de Jong, Lars Bärring, Elin Sjokvist

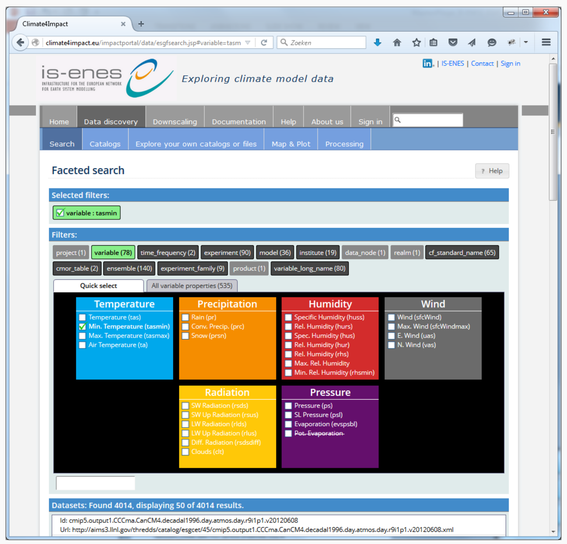
KNMI, CERFACS, University of Cantabria, SMHI, Wageningen University, CMCC, STFC, IPSL

- Dedicated to the climate impact community: based on 21 use cases
- Dissemination of model results from both global and regional model experiments
- Extensive documentation for impact modelers: guidelines, warnings, do's and don'ts
- Facilitates interaction between climate modelers, companies and climate services
- Search, visualize and compute: from Petabyte to megabyte size reduction, drill down to the information needed, downscaling and indices calculations

Search

Based on ESGF search API

Climate4impact enables faceted search based on the search API offered by the Earth System Grid Federation. It allows to create fine grained search queries, finding the results you are looking for.
The search interface is continuously adapted and improved based on user feedback.



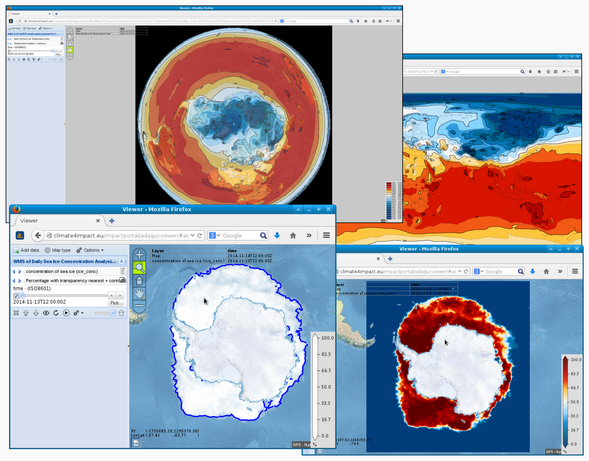
Visualize

ADAGUC WMS/WCS

ADAGUC is a geographical information system to visualize NetCDF files via the web. The software consists of a server side C++ application and a client side JavaScript application. The software provides several features to access and visualize data over the web, it uses OGC standards for data dissemination.

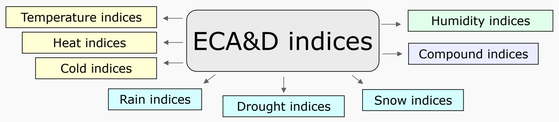
WMS on OpenDAP resources

Visualizing remote datasets using WMS is by adding OpenDAP URL's as extra key value parameter to the ADAGUC OGC service (&source=). This enables automatic visualization of OpenDAP datasets without any configuration. Currently the software is able to provide visualizations from datasets in raster format described by the Climate and Forecast (CF) conventions. WCS allows for data re-projection, subsetting and conversion to other formats.
Using the services described above, OpenDAP datasets become available to Geographical Information Systems. Bridging OpenDAP and GIS allows these datasets to be used by a new and broader user community.

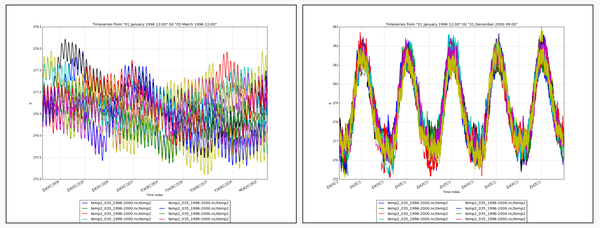


Process

ICCLIM – climate indices calculation



- Intra-period extreme temperature range [°C] - **ETR**
- Warm days (days with mean temperature > 90th percentile of daily mean temperature) - **TG90p**
- Summer days (days with max temperature > 25 °C) - **SU**
- Python code developed by CERFACS, started in September 2013
  - Generic and modular approach, can be reused in other environments
  - C functions called for optimization
- I/O interface is structured for optimal performance, with wrapper functions
- Percentile-based indices (TG10p, TX10p, TN90p, etc)



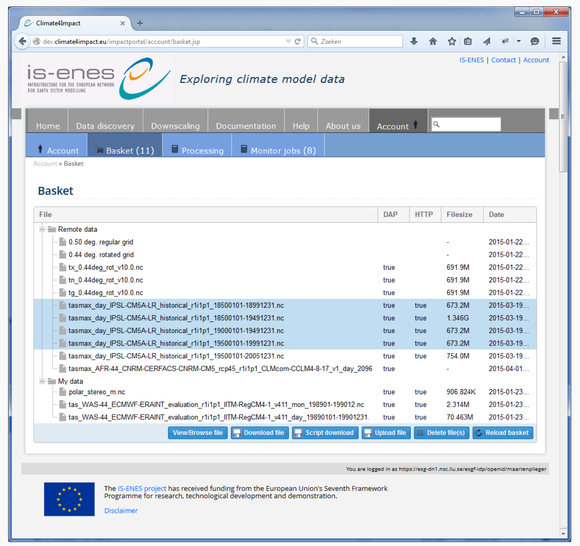
Climate4impact uses **PyWPS** and ICCLIM for Climate indices calculation / Subsetting over large time periods

User interface is build automatically based on DescribeProcess XML file.

Interface supports: Link to basket / Combo boxes / select from list / Strings/ text elements

IS-ENES2 is working on an indices wizard for user friendly indices calculation

Download



- By default the basket contains:
  - "Remote data" for links
  - "My data" for your own data
- Script based download allows to select and download multiple files
- Client certificate (x509) is embedded in download script
  - No need for MyProxy login
  - No need for firewall changes
- The basket allows for uploading your own files
  - Can be used in processing or visualization

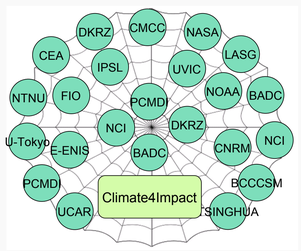
Data - ESGF

ESGF

ESGF P2P is a component architecture expressly designed to handle large-scale data management for worldwide distribution. Model simulations, satellite observations, and reanalysis products are all being served from the ESGF P2P distributed data archive.

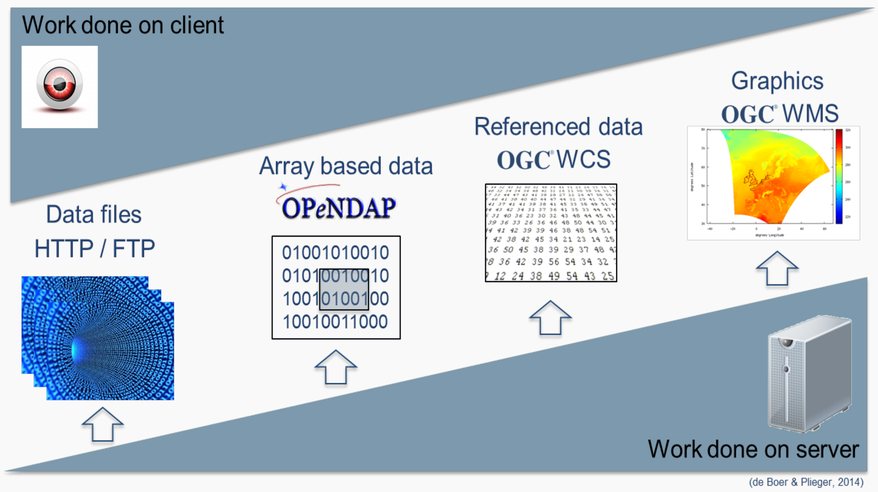
ESGF offers OpenDAP

OpenDAP provides functionality to access and subset large datasets over the web without the need for downloading a full copy. OpenDAP is great for centralized data access and data exploration. An OpenDAP server is usually used to serve NetCDF files. The NetCDF library can open a NetCDF file remotely via OpenDAP over the internet. It is transparent to the user whether the file resides on his own computer or in a webserver on the web.



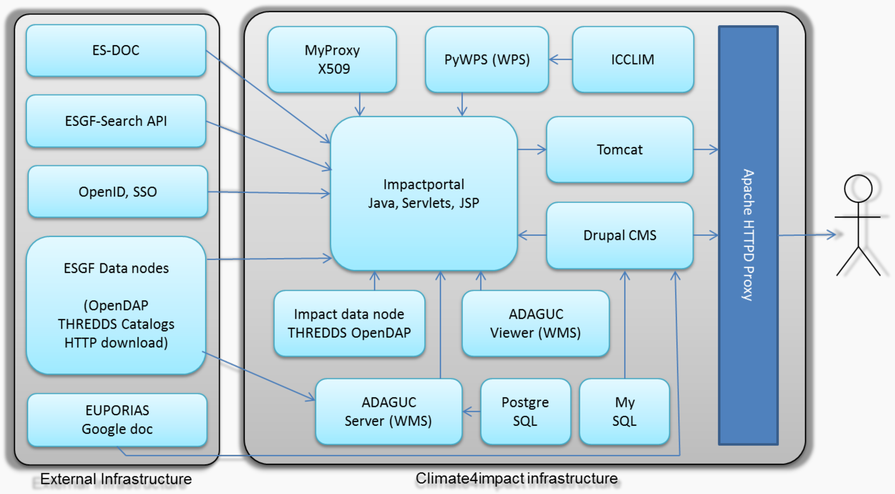
- Robust
- Distributed
- Data and processing
- Climate4impact builds on and contributes to this global infrastructure

Data → OPeNDAP → WCS → WMS



(de Boer & Plieger, 2014)

Architecture – system components



This work is supported by the ESGF consortium: DOE, NASA, NOAA, NSF, IS-ENES, NCI.

2015 ESGF F2F Conference