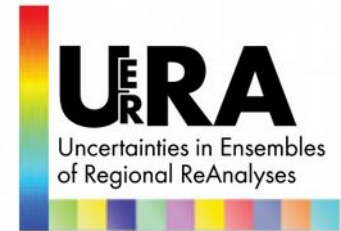




UERRA WP4



ESGF / Visualization

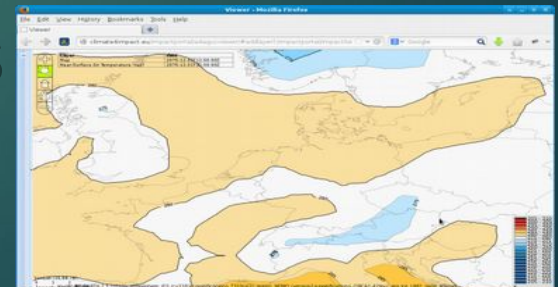
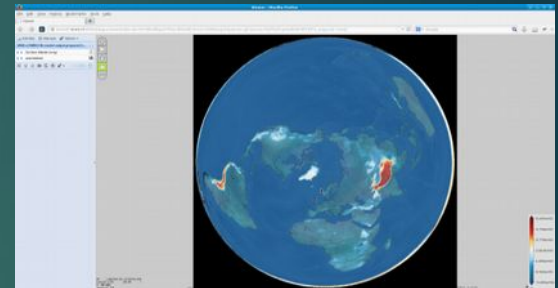
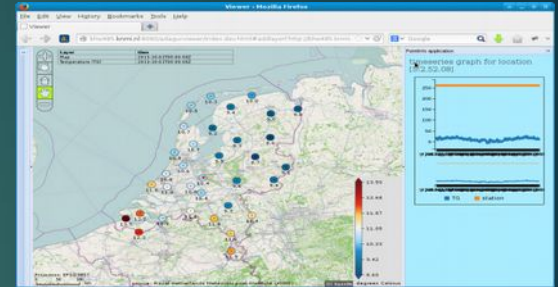
WEBSERVICES @ KNMI – UERRA GA NOVEMBER 2016, READING, UK
ESGF AND ADAGUC WEB-BASED VISUALIZATION

RICHARD CORNES
ELSE VAN DEN BESSELAAR
ANDREJ MIHAJLOVSKI
MAARTEN PLIEGER
KNMI R&D

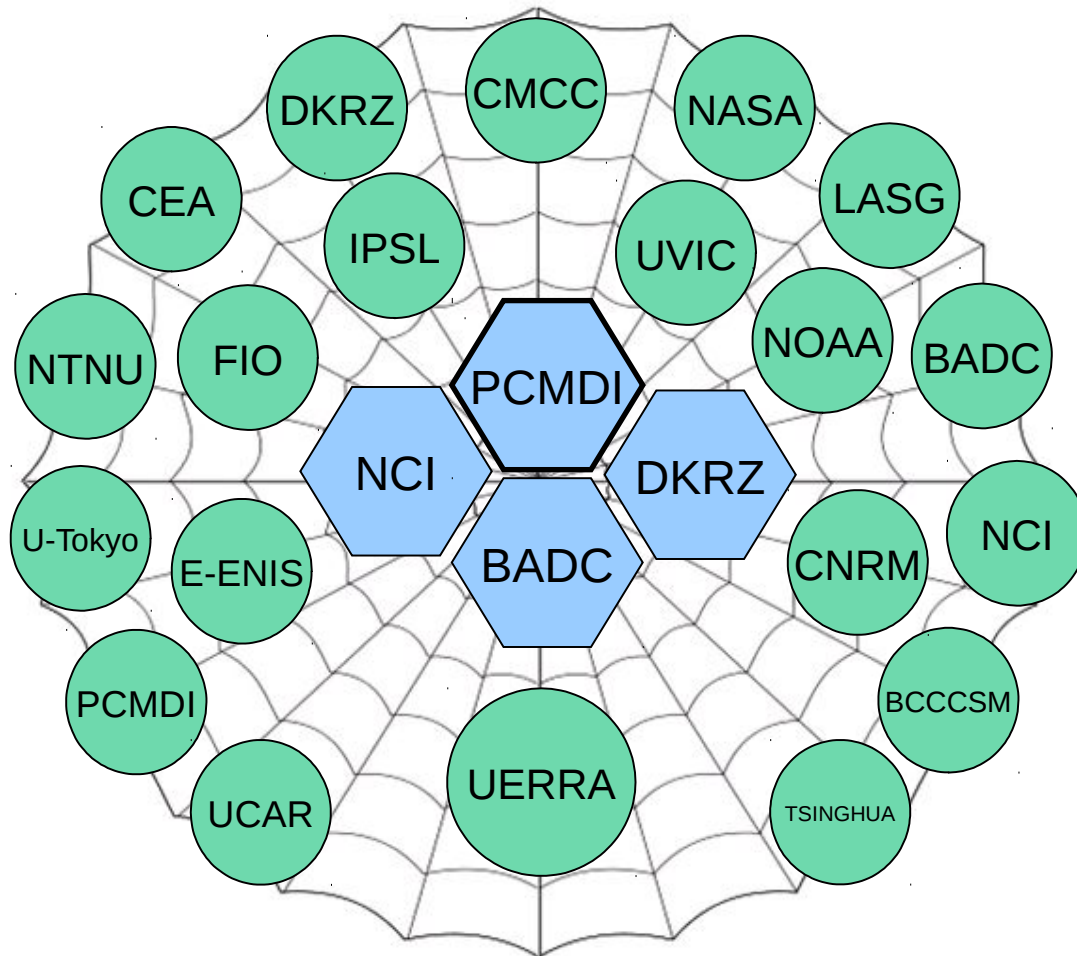
ADAGUC WEB-based visualization



- ▶ UERRA ESGF Data node
- ▶ Climate4Impact Analysis
 - ▶ Uses ESGF for data
- ▶ ADAGUC visualization
 - ▶ Interoperability with ECMWF WMS services



Earth System Grid Federation

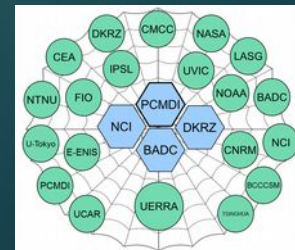


- Robust and distributed
- Global Climate Model Data (CMIP5)
- Regional Climate Model Data (CORDEX)
- ~3 Petabyte of data
- **Search API**
- **OpenDAP data access**
- **THREDDS Catalogs**
- Data only nodes and full nodes



UERRA ESGF data node

- ▶ ESGF data node for UERRA has been setup at KNMI
 - ▶ <https://esgf.knmi.nl/thredds>
- ▶ The UERRA ESGF node publishes to DKRZ full node
 - ▶ <https://esgf-data.dkrz.de/projects/uerra/>
- ▶ EOBS dataset produced by ECA&D is published
 - ▶ Data is hosted at UERRA data node at KNMI
 - ▶ Data is published at DKRZ full node
- ▶ Data is visible and searchable from any full node in the federation








<https://esgf.knmi.nl/thredds>

Catalog /thredds/catalog x

← → ↻ ⬆ ⚠ <https://esgf.knmi.nl/thredds/catalog/catalog.html?sessionId=4BB745A4E0F433CAFA8CFE93F6CF1E37> ☆ 📄 ⋮

 **Catalog /thredds/catalog/catalog.xml**

 TDS

Dataset	Size	Last Modified
 Earth System Root catalog		--

[Initial TDS Installation at My Group see Info](#)
[THREDDS Data Server \[Version 5.0.0-SNAPSHOT - 2015-12-03T07:59:46-0700\] Documentation](#)

UERRA Data node



<https://esgf-data.dkrz.de/projects/uerra/>

The screenshot shows a web browser window displaying the UERRA project page on the ESGF full node at DKRZ. The browser's address bar shows the URL <https://esgf-data.dkrz.de/projects/uerra/>. The page header includes logos for DKRZ and is-enes, and a welcome message from the ESGF CoG. The main content area features the UERRA logo and a navigation menu with links to Home, About Us, Users, Resources, and Contact Us. The page title is "Uncertainties in Ensembles of Regional ReAnalyses". The main text describes UERRA as a European FP7 reanalysis project of meteorological observations, including recovery of historical (last century) data, estimating uncertainties in the reanalyses and user friendly data services. It aims to prepare for and contribute to a future Copernicus climate change service. The last update is noted as Nov. 3, 2016, 7:21 a.m. by ESGFKNMI KNMI. There are social media share buttons for Facebook and Twitter. On the right side, there is a "Browse Projects" section with tabs for "This", "All", "My", and "Tags". It shows "Parent projects (0)", "Peer projects (0)", and "Child projects (0)". There is an "Enter Tag" input field with "Reset" and "Go" buttons. Below this, it says "UERRA Tags: None". The footer contains information about ESGF sponsors and partners, CoG version 3.7.0, ESGF P2P Version v2.3.8-master-release, Earth System CoG sponsors and partners, and links to Privacy Policy, Terms of Use, and Impressum.

ESGF full node at DKRZ showing UERRA project

ADAGUC WEB-based visualization



UERRA data is searchable in the federation:

ESGF-DKRZ Data Search

Hosted by Powered by and

Welcome, Guest | Login | Create Account

ESGF Node at DKRZ

You are at the **ESGF-DATA.DKRZ.DE** node

Home About Us Contact Us **Technical Support**

Enter Text: Display results per page [\[More Search Options \]](#)

☐ Show All Replicas ☐ Show All Versions ☐ Search Local Node Only (Including All Replicas)

Search Constraints: **UERRA**

Total Number of Results: 1
-1-
Please login to add search results to your Data Cart
Expert Users: you may display the search URL and return results as XML or return results as JSON

1. **UERRA.observations.EOBS.EUR-25.KNMI.day.tg.0.25deg.v14.0**
Data Node: esgf.knmi.nl
Version: 1
Total Number of Files (for all variables): 1
[\[Show Metadata \]](#) [\[Hide Files \]](#) [\[THREDDS Catalog \]](#) [\[WGET Script \]](#)

Total Number of Files: 2

1	tg_EOBS_KNMI_0.25deg.nc Checksum: f2f3df1190d702f726dade039fd652637c7cbc7344a5793b0b6ac529f211d94c Size: 4295069107 [More File Metadata]	HTTPServer OPENDAP
2	tg_EOBS_KNMI_0.25deg_1950_2016.nc Checksum: f4b09896b6511d0d0183c0eb188c01e329b47153958ee1293bc761c31162d4a4 Size: 4542072497 Tracking Id: fbf9154-2d41-42ca-8fab-e8529bc6604a [More File Metadata]	HTTPServer OPENDAP



And can also be found and used in climate4impact

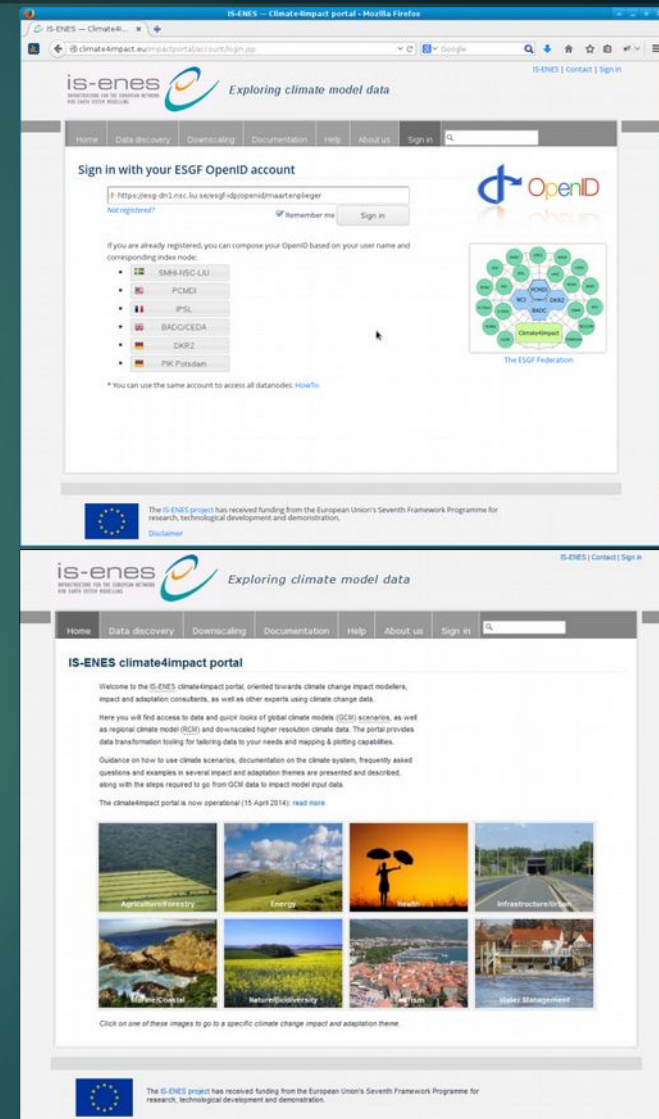
The screenshot shows the climate4impact web portal interface. The browser address bar displays the URL: <https://climate4impact.eu/impactportal/data/esgfsearch.jsp#project=UERRA&>. The page header includes the 'is-enes' logo and the tagline 'Exploring climate model data'. A navigation menu at the top contains links for Home, Data discovery, Downscaling, Documentation, Help, About us, and Sign in. Below this, a secondary menu includes Search, Catalogs, Explore your own catalogs or files, Map & Plot, and Processing. The main content area features a 'Filters' section with buttons for Project (1), Parameter (1), Date, Geobox, and Free text, along with links to show or clear all filters. The 'Selected filters' section shows 'Project : UERRA' with a checkmark. A message states 'Found 1 datasets. Displaying page 1 of 1.' Below this, a table lists the datasets. The table has columns for #, Resource title, Size, Opendap, Download, and Basket. The first dataset is 'UERRA.observations.EOBS.EUR-25.KNMI.day.tg.0.25deg.v14.0.v1' with a catalog URL and a text filter input. The second dataset is 'tg_EOBS_KNMI_0.25deg_1950_2016.nc' with a size of 4.542G and a download link. Navigation buttons for 'Previous', '1', and 'Next' are present at the bottom of the table.

#	Resource title	Size	Opendap	Download	Basket
1	UERRA.observations.EOBS.EUR-25.KNMI.day.tg.0.25deg.v14.0				
2	tg_EOBS_KNMI_0.25deg_1950_2016.nc	4.542G	view	download	basket

<https://climate4impact.eu/impactportal/data/esgfsearch.jsp#project=UERRA&>

ADAGUC WEB-based visualization

- ▶ Platform for impact researchers to explore climate data and perform analysis
- ▶ Searches ESGF using search API
- ▶ Uses ADAGUC WMS visualization
- ▶ ADAGUC visualizes ESGF data using OpenDAP
- ▶ Perform calculations
 - ▶ Climate indices calculation, data reduction
 - ▶ Personal store for processing outcomes
 - ▶ Upload and store your own data





Work with your data, e.g. subset, regrid

Account • Processing • Wizard convert and subset

Convert and subset

Resource
http://aims3.lnl.gov/thredds/dodsC/cmp5_css01_dat

Variable
pr

Projection
EPSG:4326

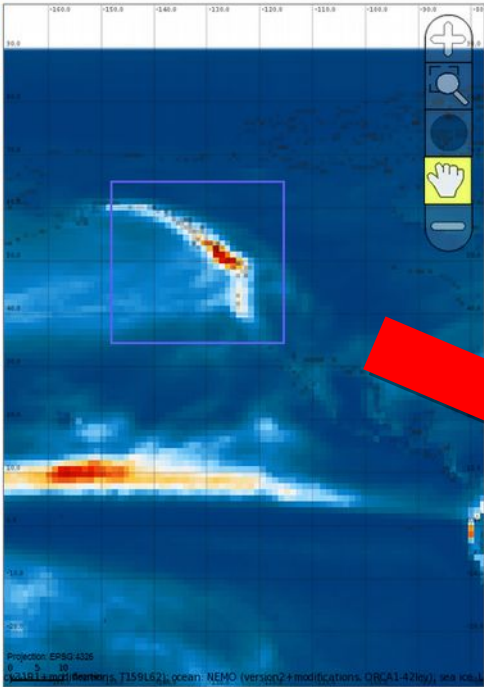
Bounding box
North: 64.6536175441
West: -147.967482638 East: -115.779635416
South: 34.5485133775

Resolution
Horizontal: 1.125 width: 29
Vertical: 1.121276975 height: 27

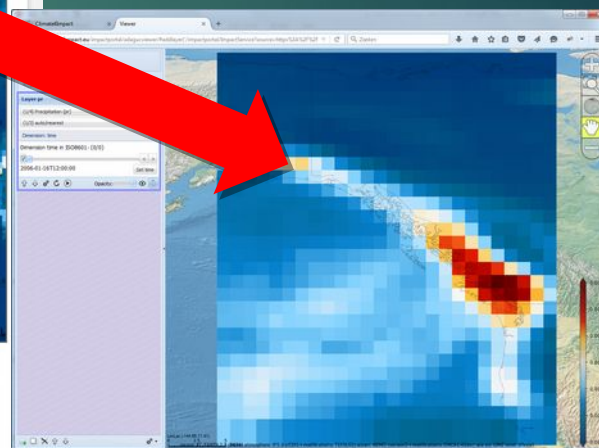
Dates
Start date: 2006-01-16T12:00:00
Stop date: 2006-12-16T12:00:00
Time resolution: P1D

Format
netcdf
netcdf
geotiff : name
aagrid
out.nc

Start processing



- ▶ Data reduction
- ▶ Subsetting
- ▶ GIS formats
- ▶ Reprojection





ADAGUC: Visualize and combine different sources

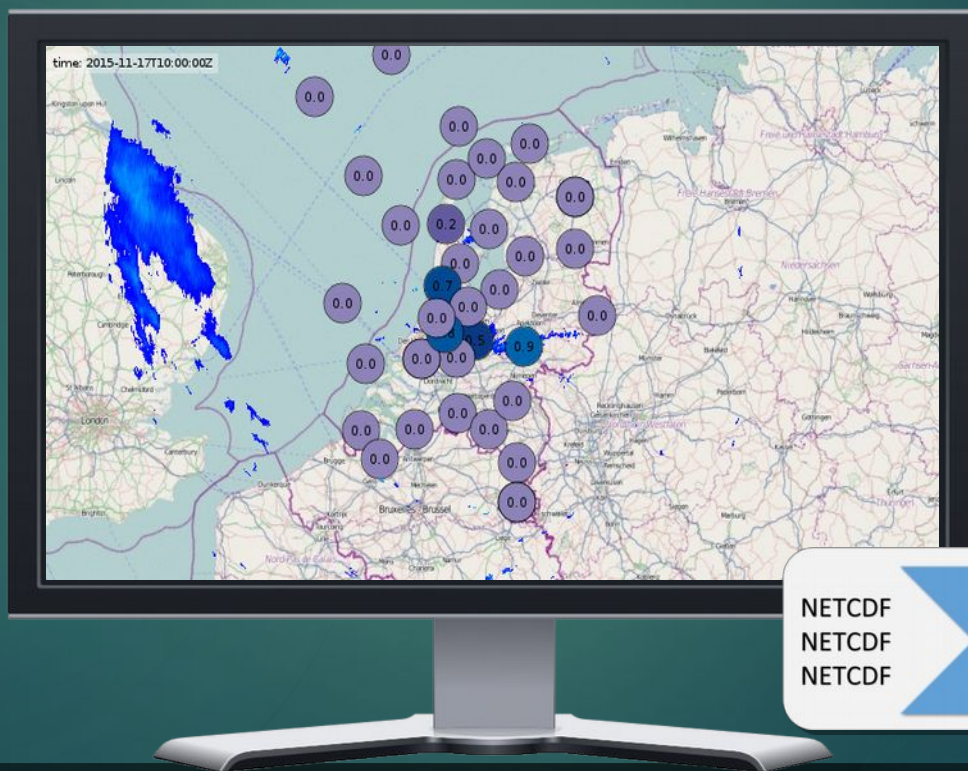
Share research results

Share data via internal network

Web Map Services on all workstations

Experiment with data without interfering operational systems

Precipitation radar
Every 5 minutes



Observations
Every 10 minutes

ADAGUC WEB-based visualization



ADAGUC software for web services

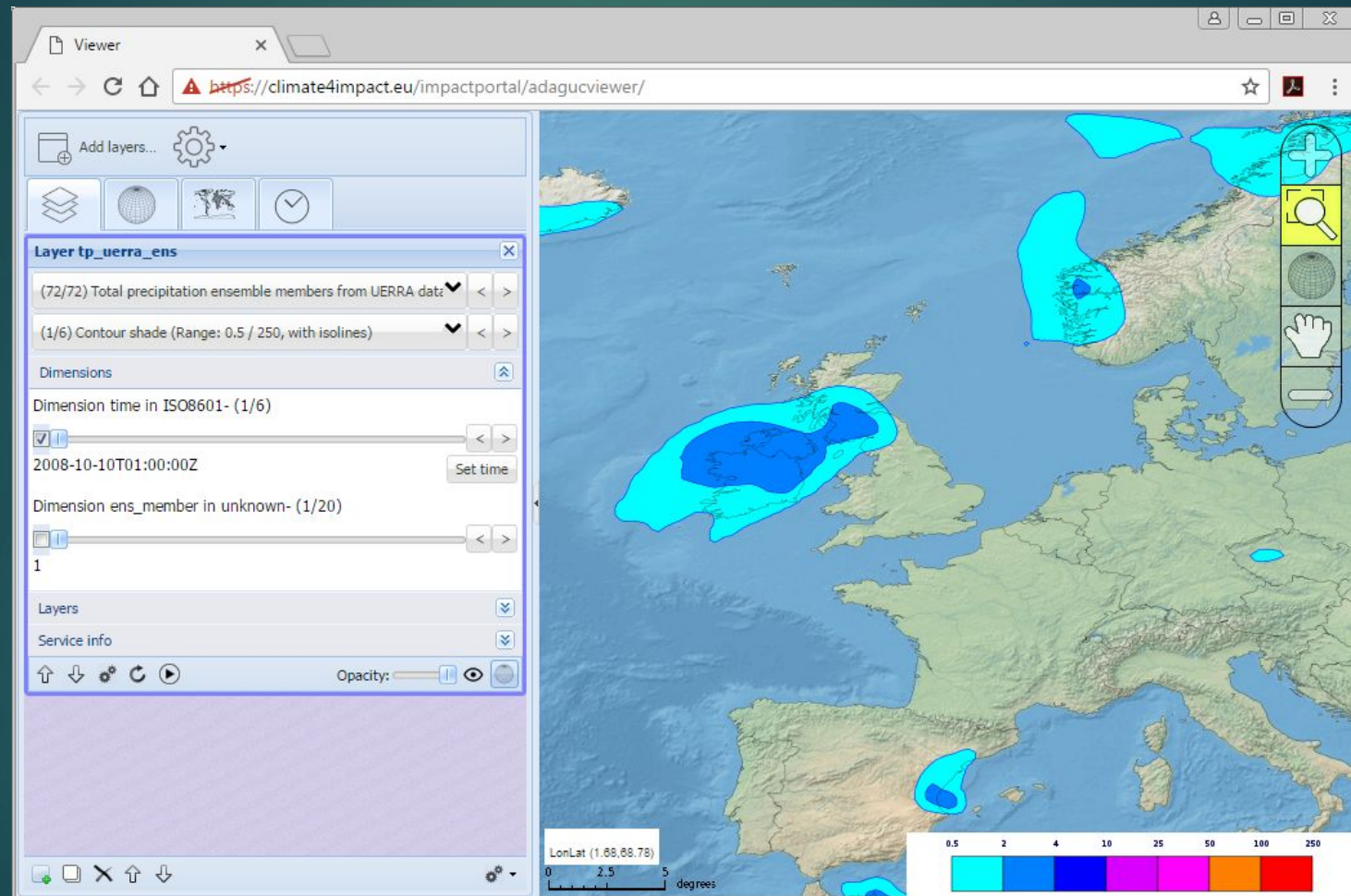
- ▶ ADAGUC – KNMI development since 2009
 - ▶ Serves OPeNDAP, WMS and WCS
 - ▶ Server (C++) and Viewer (JS) using WMS standard
 - ▶ Reads data in NetCDF format, OpenDAP and ESGF
 - ▶ AutoWMS mode – Automatic reading of your files
 - ▶ Precipitation radar is publicly available as WMS,
 - ▶ data since 2009, new data each 5 minutes, ~70000



<http://adaguc.knmi.nl/>
(open source + wiki)



Interoperability with ECMWF Web services





For UERRA (WP4)

- ▶ KNMI has installed an ESGF data node for UERRA
 - ▶ Data is published and accessible in the federation

- ▶ Climate4impact uses ESGF
 - ▶ Perform online analytics, play with your data
 - ▶ Visualizes resources from ESGF/THREDDS/netCDF/OpenDAP
 - ▶ Using ADAGUC
 - ▶ Uses WMS/WCS/WPS

- ▶ To get your data in climate4impact:
 1. Serve your data via your own THREDDS server
 2. Login at climate4impact and upload your netCDF file
 3. Make your data available through UERRA ESGF data node
 4. Contact us



Thanks for listening!!!

- ▶ <https://esgf.knmi.nl/thredds>
- ▶ <https://esgf-data.dkrz.de/projects/uerra/>
- ▶ <http://euro4mvis.knmi.nl/>
- ▶ <http://adaguc.knmi.nl/>
- ▶ <https://climate4impact.eu/>

- ▶ For any questions:
 - ▶ Else van den Besselaar: besselaar@knmi.nl
 - ▶ Maarten Plieger: maarten.plieger@knmi.nl
 - ▶ esgf@knmi.nl