



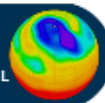
e-Infrastructure for Climate and Atmospheric Science Research



Dr Matt Pritchard

Centre for Environmental
Data Archival (CEDA)

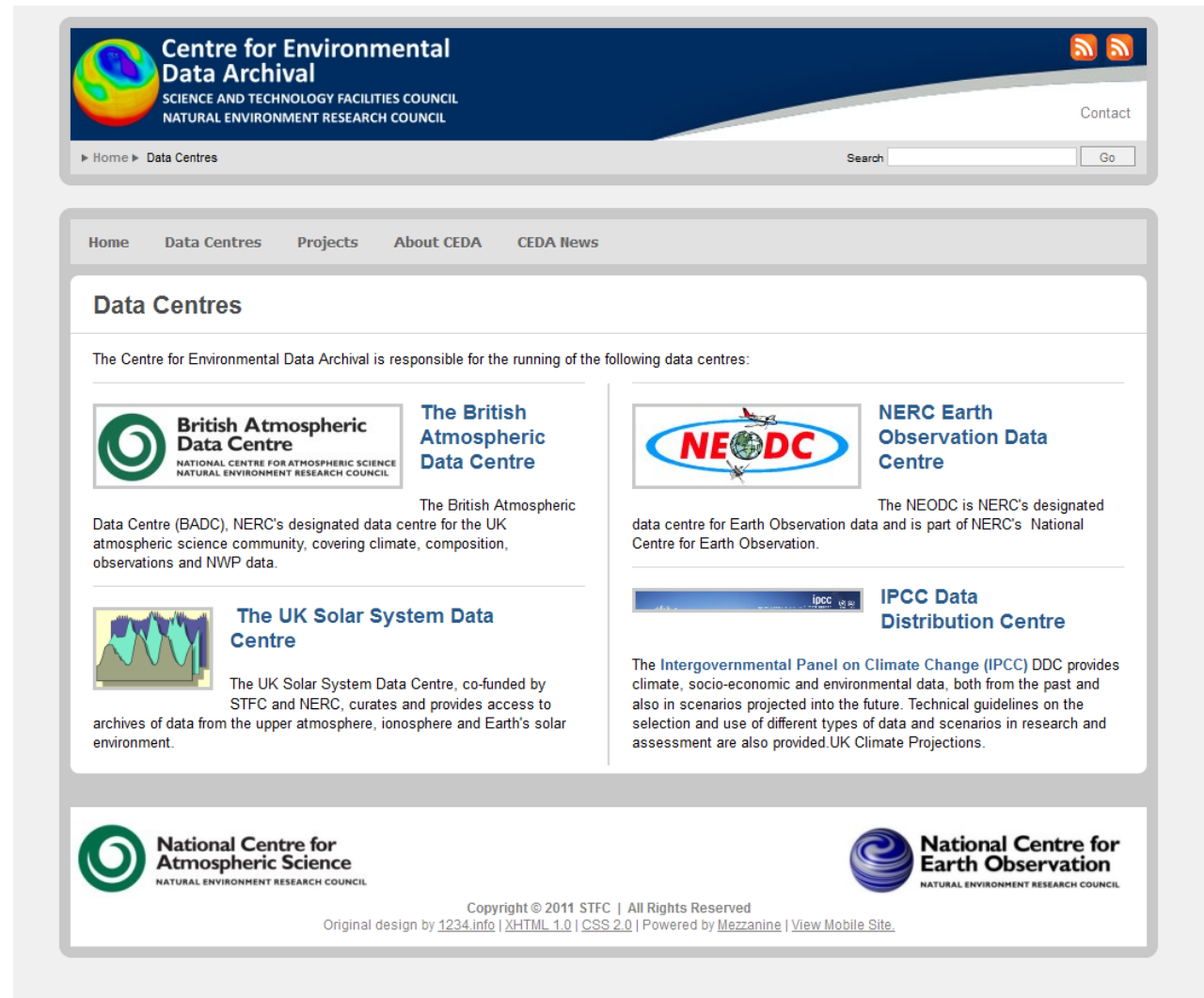
www.ceda.ac.uk



Centre for Environmental Data Archival

www.ceda.ac.uk

- BADC
- NEODC
- UKSSDC
- IPCC DDC




The screenshot shows the homepage of the Centre for Environmental Data Archival. The header features the CEDA logo and the text 'Centre for Environmental Data Archival', 'SCIENCE AND TECHNOLOGY FACILITIES COUNCIL', and 'NATURAL ENVIRONMENT RESEARCH COUNCIL'. A search bar and a 'Contact' link are also present. The main navigation menu includes 'Home', 'Data Centres', 'Projects', 'About CEDA', and 'CEDA News'. The 'Data Centres' section is highlighted, listing four data centres: British Atmospheric Data Centre (BADC), NEODC (NERC Earth Observation Data Centre), The UK Solar System Data Centre, and IPCC Data Distribution Centre. Each entry includes a logo and a brief description of the centre's role. The footer contains the logos for the National Centre for Atmospheric Science and the National Centre for Earth Observation, along with copyright information and links to the original design and mobile site.

Centre for Environmental Data Archival
SCIENCE AND TECHNOLOGY FACILITIES COUNCIL
NATURAL ENVIRONMENT RESEARCH COUNCIL


Home Data Centres Projects About CEDA CEDA News

Data Centres

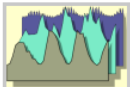
The Centre for Environmental Data Archival is responsible for the running of the following data centres:

**British Atmospheric Data Centre**
NATIONAL CENTRE FOR ATMOSPHERIC SCIENCE
NATURAL ENVIRONMENT RESEARCH COUNCIL


The British Atmospheric Data Centre (BADC), NERC's designated data centre for the UK atmospheric science community, covering climate, composition, observations and NWP data.

**NERC Earth Observation Data Centre**


The NEODC is NERC's designated data centre for Earth Observation data and is part of NERC's National Centre for Earth Observation.


**The UK Solar System Data Centre**

The UK Solar System Data Centre, co-funded by STFC and NERC, curates and provides access to archives of data from the upper atmosphere, ionosphere and Earth's solar environment.

**IPCC Data Distribution Centre**

The Intergovernmental Panel on Climate Change (IPCC) DDC provides climate, socio-economic and environmental data, both from the past and also in scenarios projected into the future. Technical guidelines on the selection and use of different types of data and scenarios in research and assessment are also provided. UK Climate Projections.

**National Centre for Atmospheric Science**
NATURAL ENVIRONMENT RESEARCH COUNCIL

**National Centre for Earth Observation**
NATURAL ENVIRONMENT RESEARCH COUNCIL

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Original design by [1234 info](#) | [XHTML 1.0](#) | [CSS 2.0](#) | Powered by [Mezzanine](#) | [View Mobile Site](#).

Centre for Environmental Data Archival

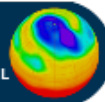
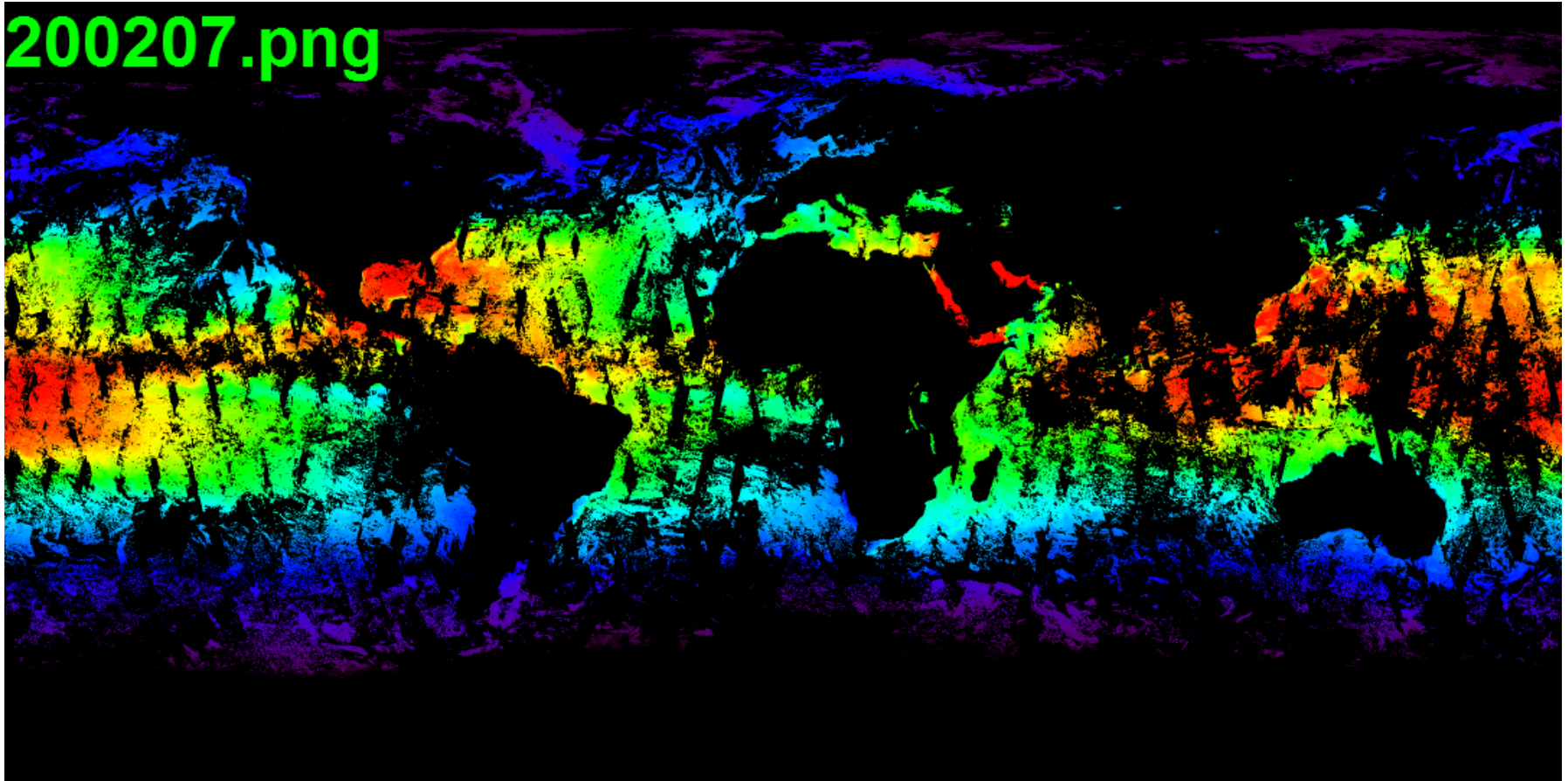
CEDA Data

Project	Type	Current volume (Tb)
NEODC	Earth Observation	300
BADC	Atmospheric Science	350
CMIP5	Climate Model	350
Total		1000 Tb = 1 Pb



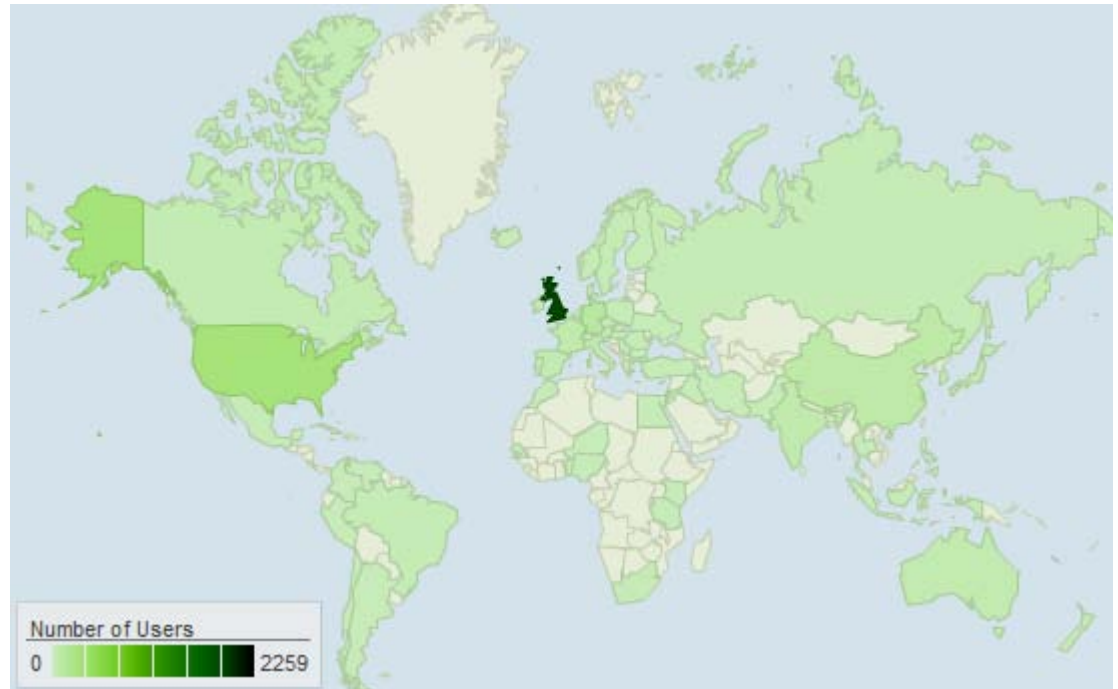
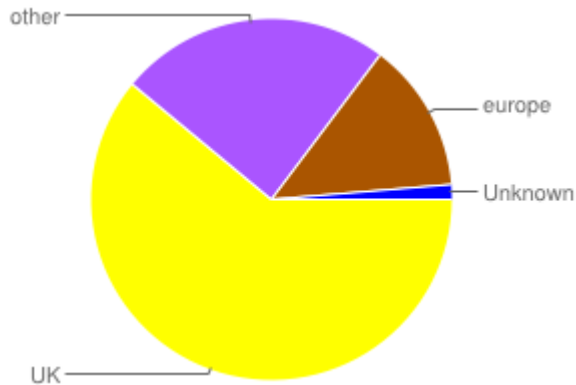
Sea Surface Temperature from space

200207.png



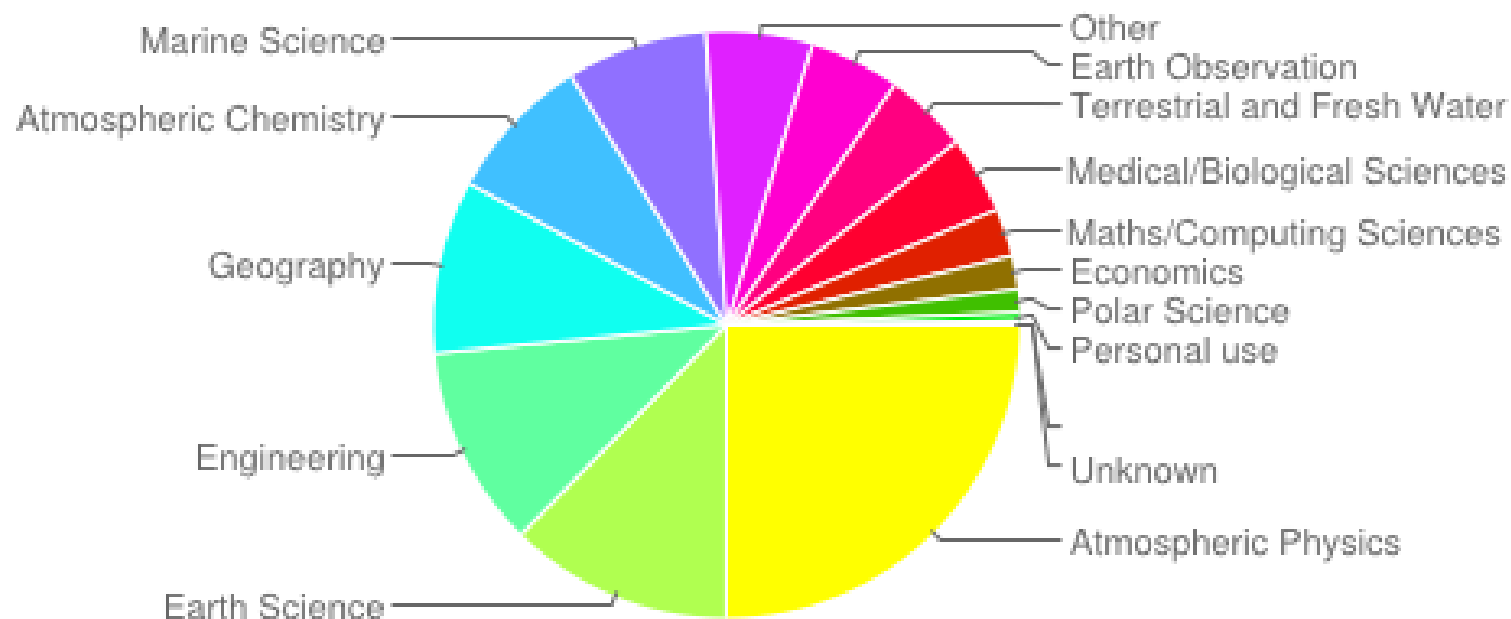
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CEDA Users



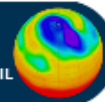
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CEDA Users



Centre for Environmental Data Archival

CEDA Activities



e-Infrastructure Investment



JASMIN/CEMS Data

Project	JASMIN	CEMS
NEODC Current		300
BADC Current	350	
CMIP5 Current	350	
CEDA Expansion	200	200
CMIP5 Expansion	800	300
CORDEX	300	
MONSooN Shared Data	400	
Other HPC Shared Data	600	
User Scratch	500	300
Totals	3500 Tb	1100 Tb

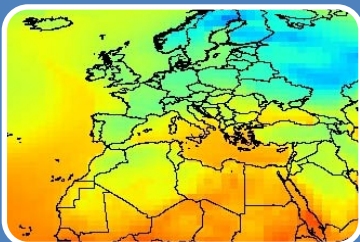


JASMIN functions



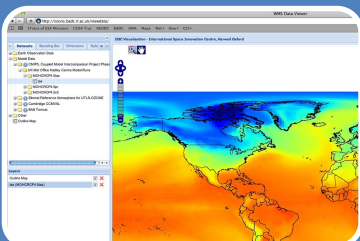
CEDA data storage & services

- Curated data archive
- Archive management services
- Archive access services (HTTP, FTP, Helpdesk, ...)



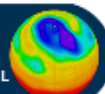
Data intensive scientific computing

- Global / regional datasets & models
- High spatial, temporal resolution
- Private cloud



Flexible access to high-volume & complex data for climate & earth observation communities

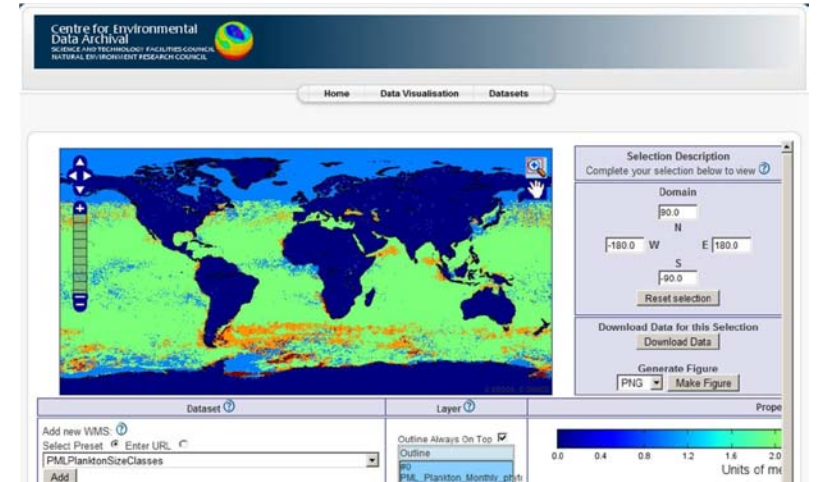
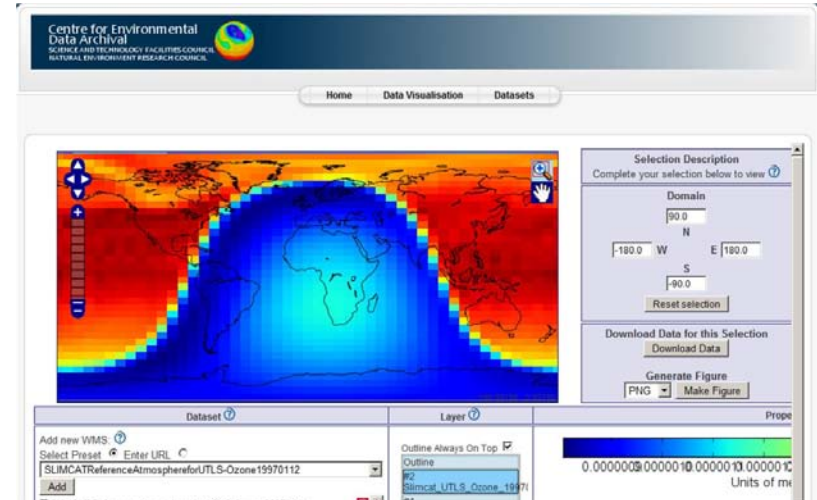
- Online workspaces
- Services for sharing & collaboration





Use cases

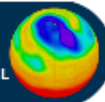
- Processing large volume EO datasets to produce:
 - Essential Climate Variables
 - Long term global climate-quality datasets
- EO data validation & intercomparisons
 - Evaluation of models relying on the required datasets (EO datasets & in situ) and simulations) being in the same place





Use cases

- User access to 5th Coupled Model Intercomparison Project (CMIP5)
 - Large volumes of data from best climate models
 - Greater throughput required
- Large model analysis facility
 - Workspaces for scientific users. Climate modellers need 100s of Tb of disk space, with high-speed connectivity
 - UPSCALE project
 - 250 Tb in 1 year
 - PRACE supercomputing facility in Germany (HERMIT)
 - Being shipped to RAL at present
 - To be analysed by Met Office as soon as available
 - Deployment of VMs running custom scientific software, co-located with data
 - Outputs migrated to long term archive (BADC)

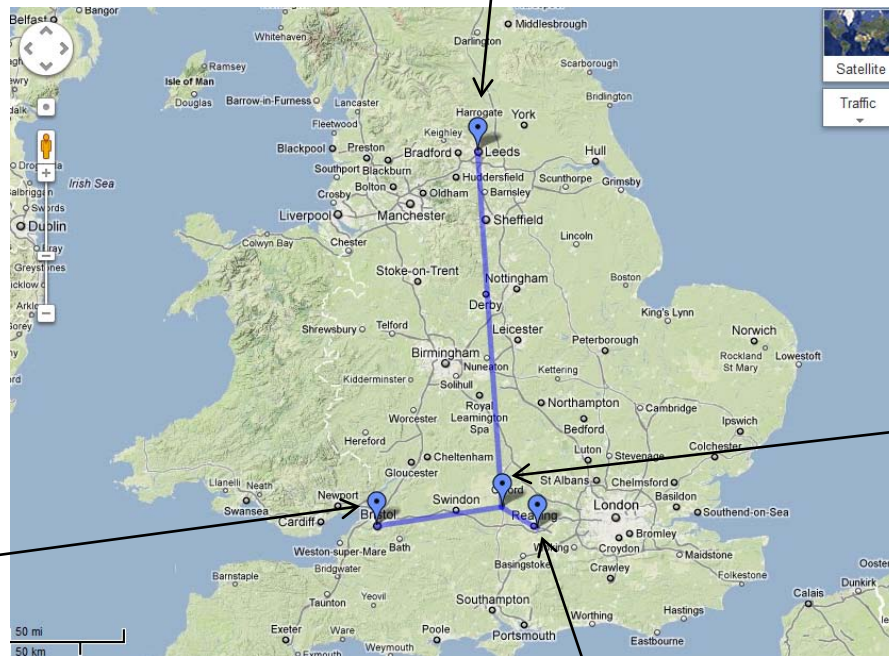




JASMIN locations

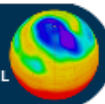
JASMIN-North
University of Leeds
150 Tb

JASMIN-West
University of Bristol
150 Tb



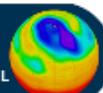
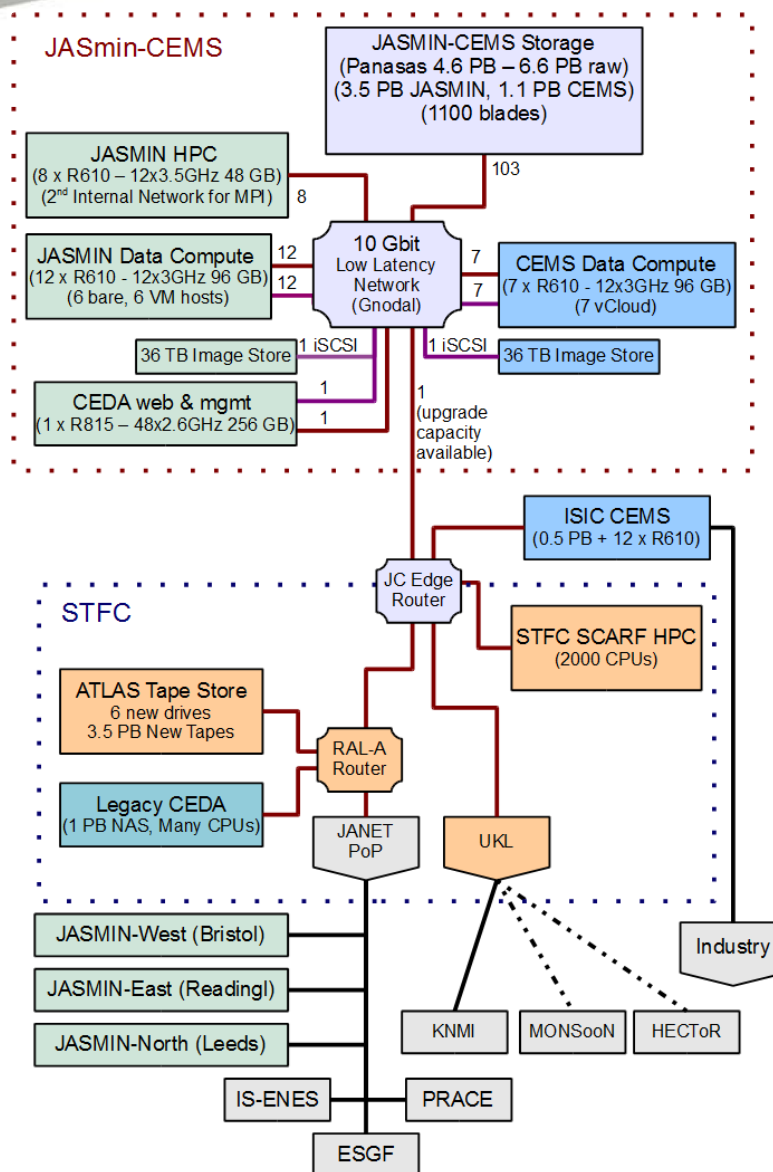
JASMIN-Core
STFC RAL
3.5 Pb + compute

JASMIN-South
University of Reading
500 Tb + compute



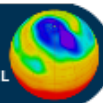
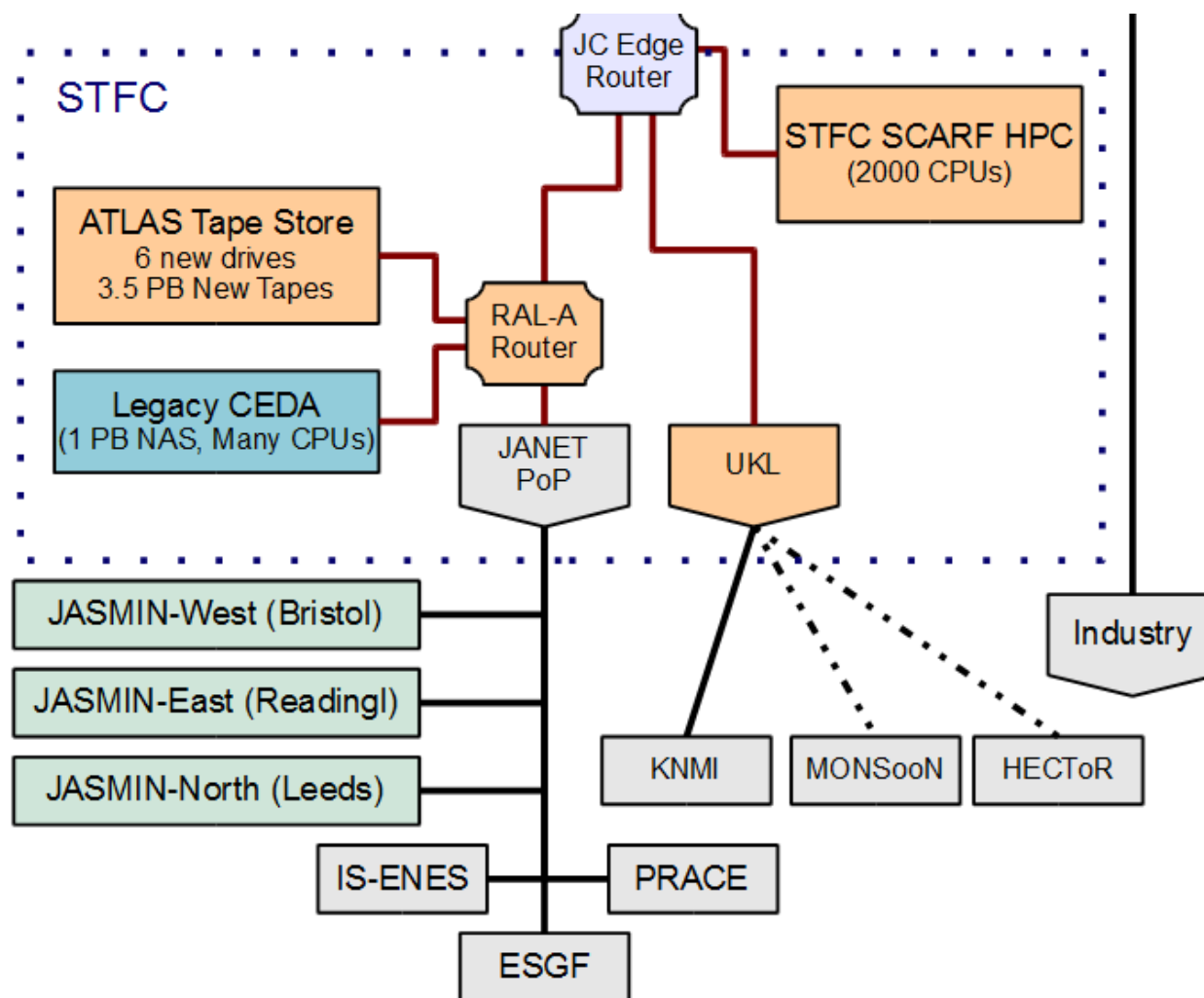


JASMIN kit



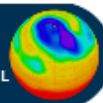
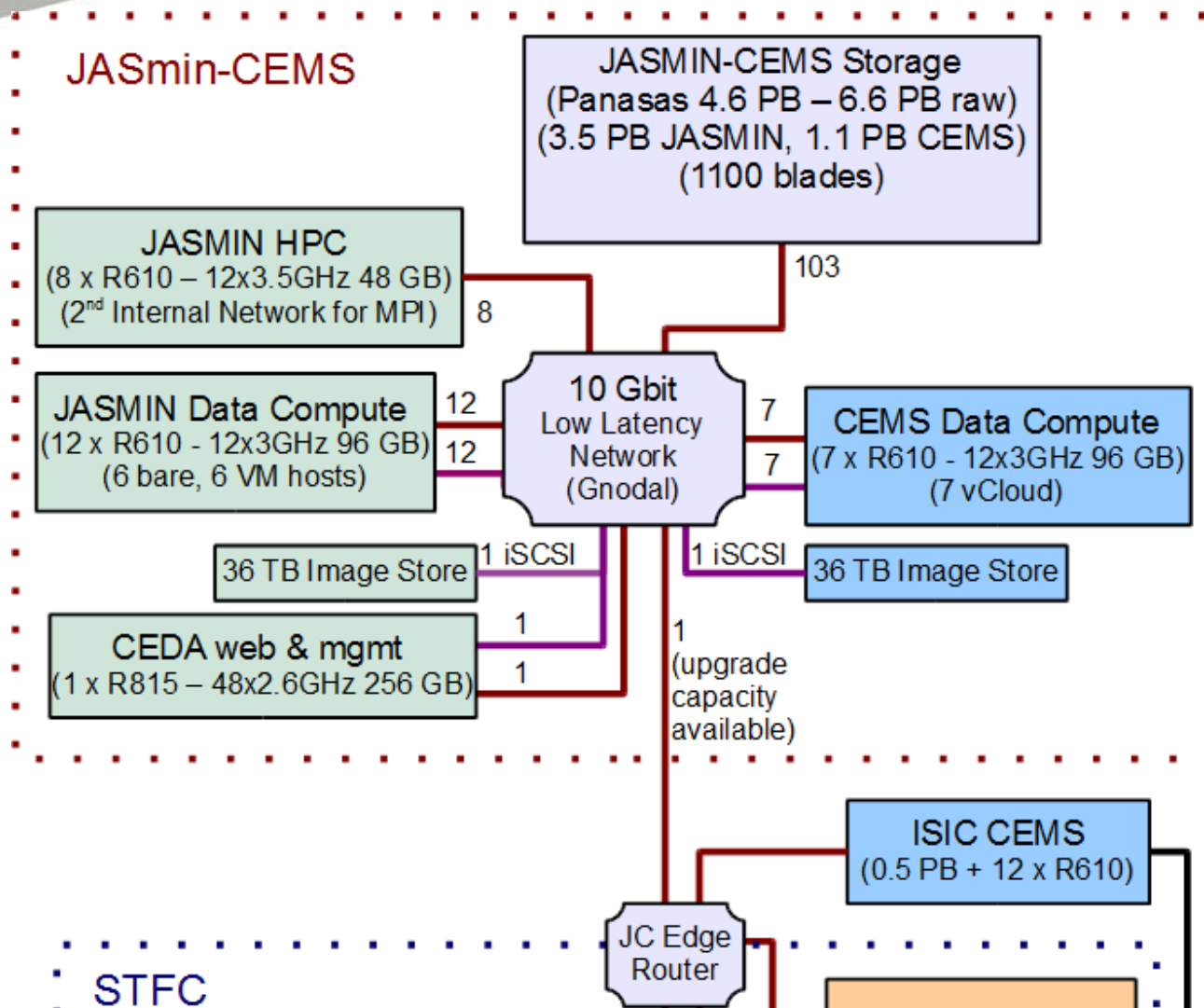


JASMIN kit





JASMIN kit



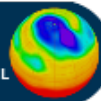
JASMIN/CEMS Facts and figures

- *JASMIN:*
 - *3.5 Petabytes Panasas Storage*
 - *12 x Dell R610 (12 core, 3.0GHz, 96G RAM) Servers*
 - *1 x Dell R815 (48 core, 2.2GHz, 128G RAM) Servers*
 - *1 x Dell Equallogic R6510E (48 TB iSCSI VMware VM image store)*
 - *VMWare vSphere Center*
 - *8 x Dell R610 (12 core, 3.5GHz, 48G RAM) Servers*
 - *1 x Force10 S4810P 10GbE Storage Aggregation Switch*



JASMIN/CEMS Facts and figures

- *CEMS:*
 - *1.1 Petabytes Panasas Storage*
 - *7 x Dell R610 (12 core 96G RAM) Servers*
 - *1 x Dell Equallogic R6510E (48 TB iSCSI VMware VM image store)*
 - *VMWare vSphere Center + vCloud Director*

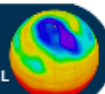
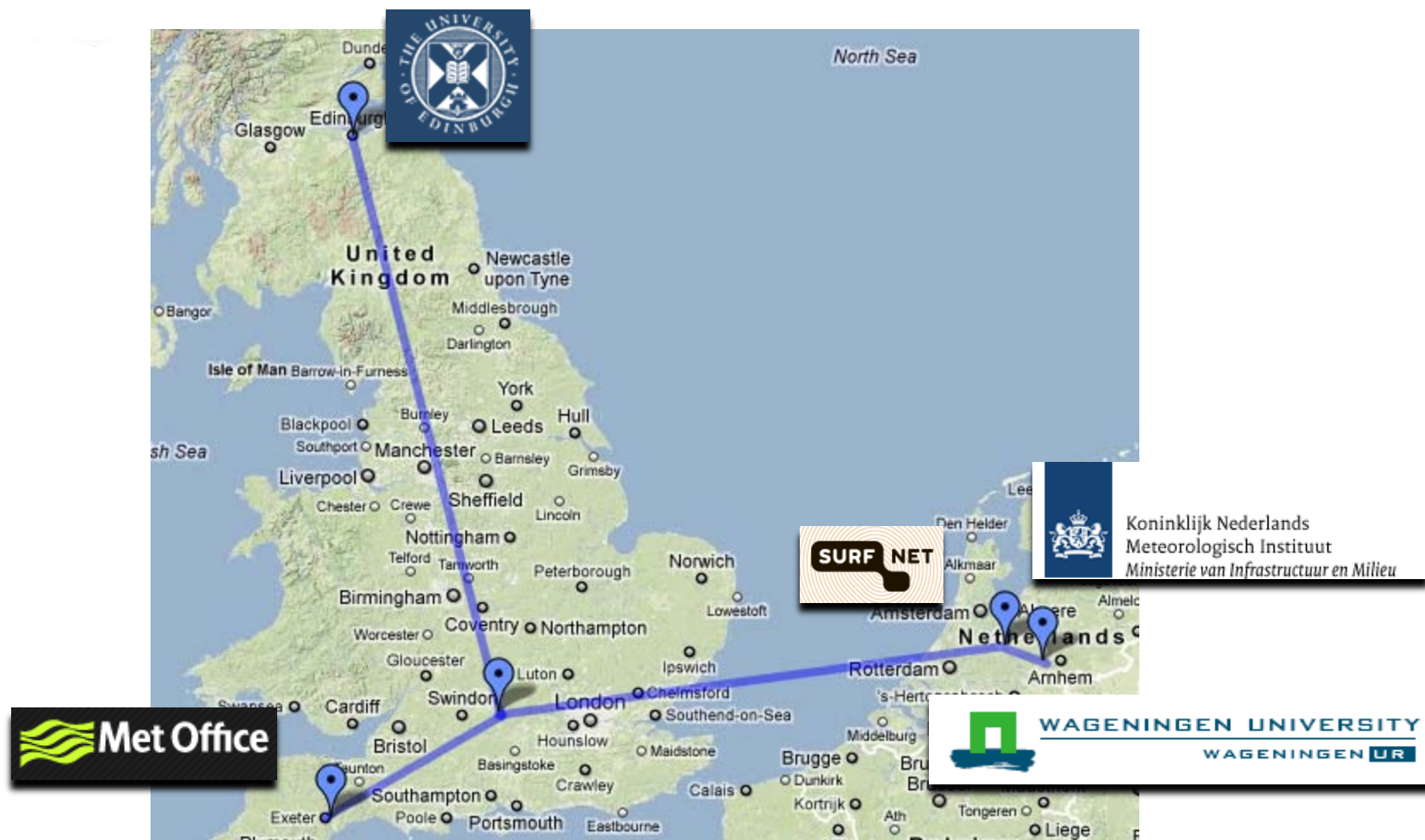


JASMIN/CEMS Facts and figures

- *Complete 4.5 PB (usable - 6.6PB raw) Panasas storage managed as one store, consisting of:*
 - 103 4U “Shelves” of 11 “Storage Blades”
 - 1,133 (-29) “Storage Blades” with 2x 3TB drives each
 - 2,266 3.5" Disc Drives (3TB Each)
 - $103 * 11 * 1 - 29 = 1,104$ CPUs (Celeron 1.33GHz CPU w. 4GB RAM)
 - 29 “Director Blades” with Dual Core Xeon 1.73GHz w.8GB RAM)
 - 15 kW Power in / heat out per rack = 180 kW (**10-20 houses worth**)
 - 600kg per rack = 7.2 Tonnes
 - **1.03 Tb/s total storage bandwidth = Copying 1500 DVDs per minute**
 - **4.6PB Useable == 920,000 DVD's = a 1.47 km high tower of DVDs**
 - **4.6PB Useable == 7,077,000 CDs = a 11.3 km high tower of CDs**



JASMIN links





<http://www.ceda.ac.uk>

<http://www.stfc.ac.uk/e-Science/38663.aspx>

Thank you!