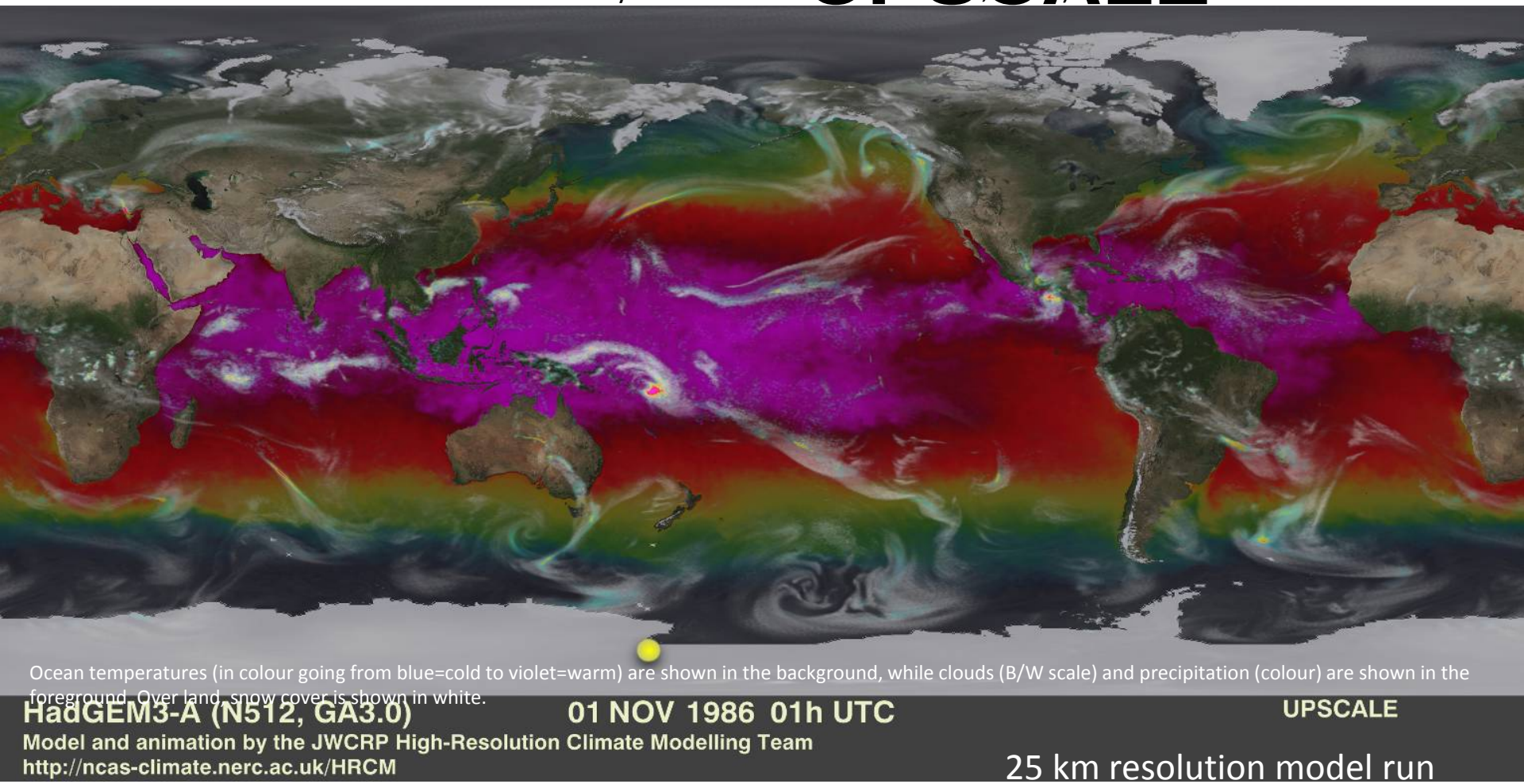
JASMIN Use cases

- 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)

"We would never have been able to store, nor analyse that volume of data, without the existence of the [JASMIN] service…" – UPSCALE spoke-scientist

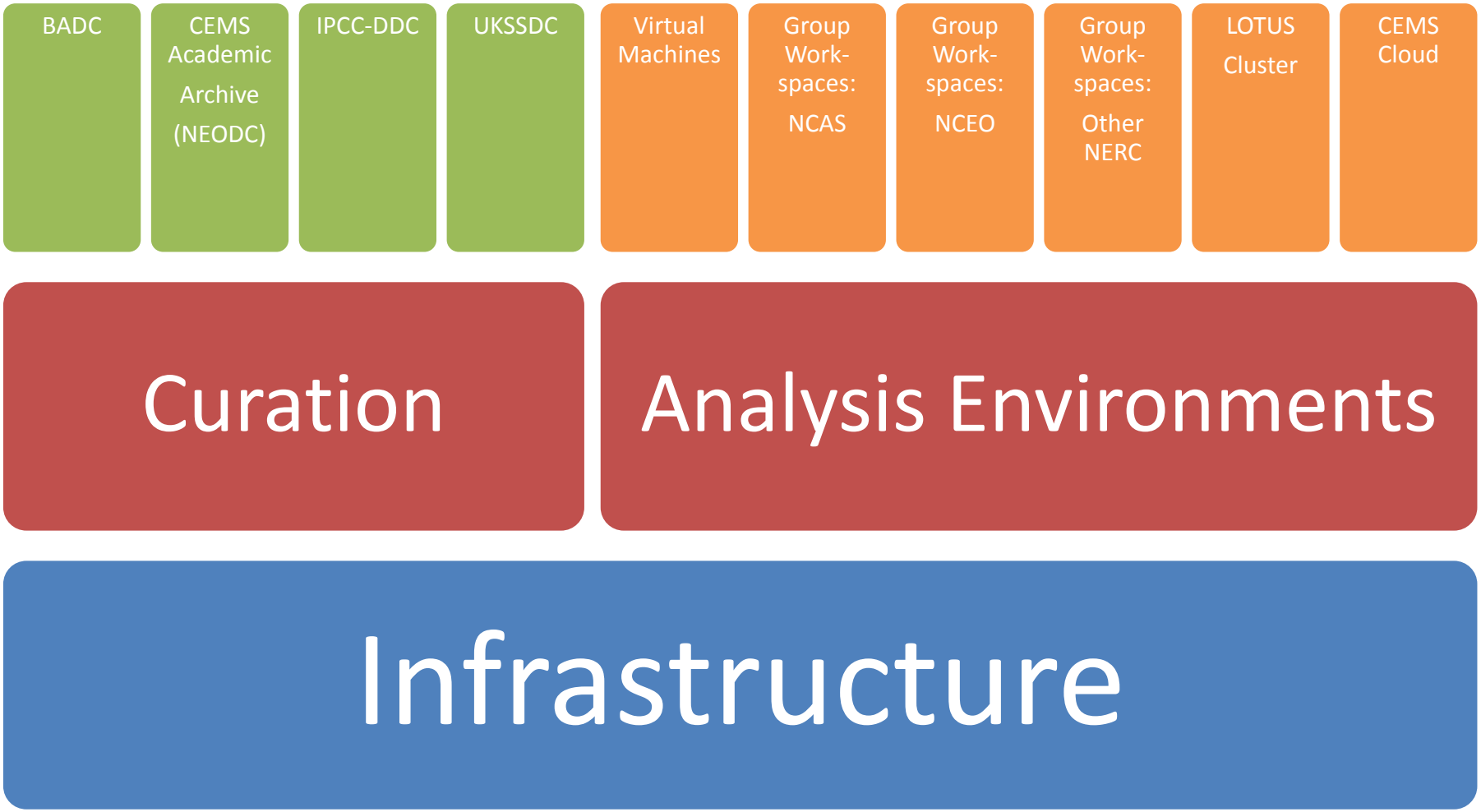
JASMIN Use Case: UPSCALE

Picture courtesy of P-L Vidale & R. Schiemann, NCAS)



The **largest ever** PRACE computational project, led by the UK, **dependent on CEDA-BADC** to provide the data links and data analysis environment!

The JASMIN CEMS Infrastructure



Virtual Machines (VMs)

- JASMIN provides a virtualisation platform in which Virtual Machines (VMs) can be hosted.

- **General purpose VMs** are provided with commonly-used software installed for users wishing to perform analysis of data within the archive or their Group Workspaces (e.g. jasmin-sci1).

- **Dedicated VMs** can be provided where there is a scientific, performance or logistical requirement that cannot be met by the general purpose VMs or where access needs to be restricted to particular users.

Group Work Spaces (GWS)

- Group Work Spaces (GWS) are **portions of storage allocated for particular project**

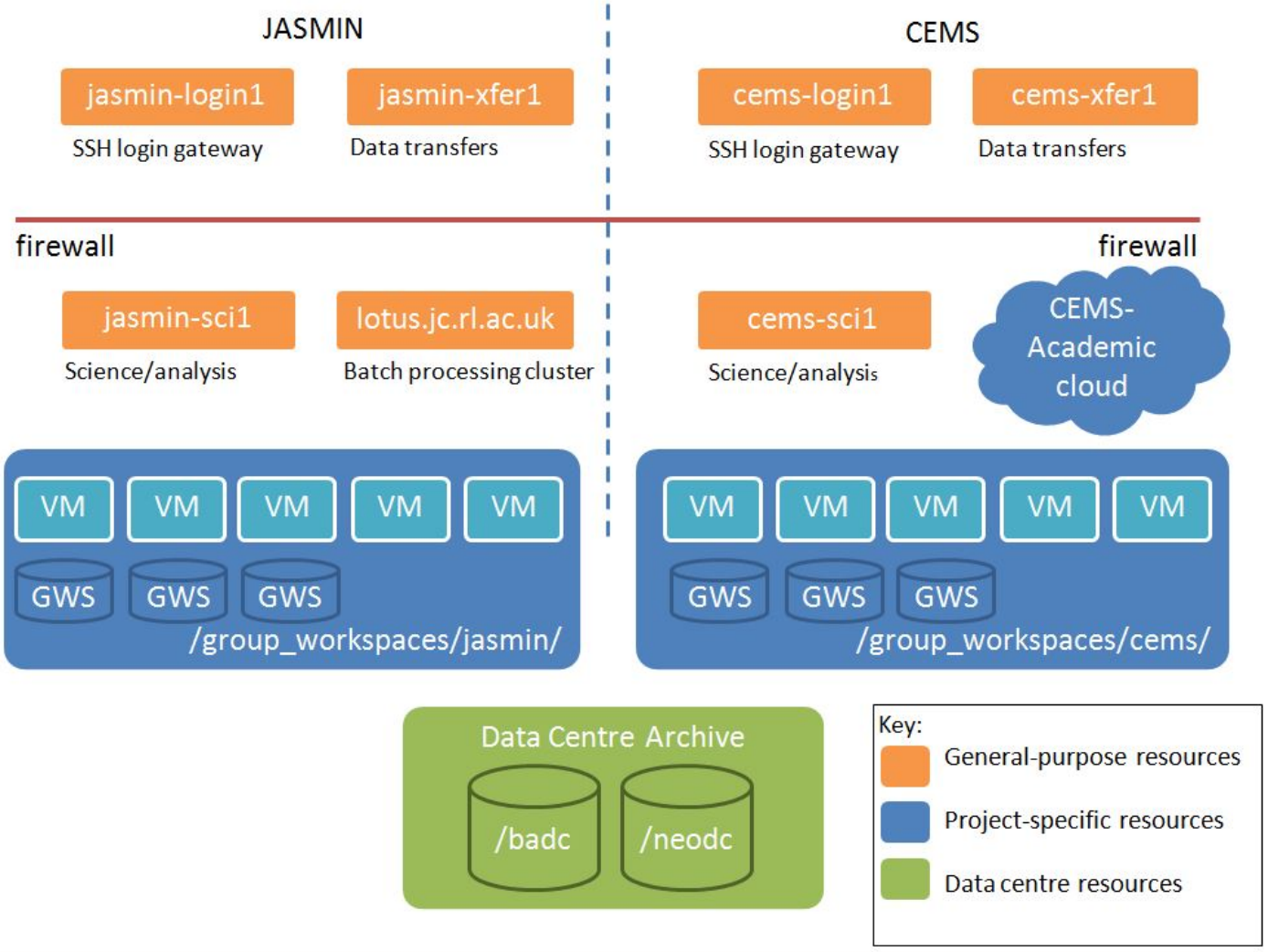
- Users can pull data from external sites to shared storage and then process and analyse their data.

- Group Work Spaces are **not the same as the CEDA archive**: GWS data are not curated for long-term storage

- Data in a GWS can be ingested by arrangement with CEDA but is not automatic
- Data in a GWS are **not backed up by CEDA**.

LOTUS Cluster

- LOTUS is the Batch Processing Facility available on JASMIN.
- Users can employ LOTUS for large processing requests that benefit from multiple tasks being run in parallel.
- Documentation:
- http://www.ceda.ac.uk/help/users-guide/lotus/ .
- All JASMIN and CEMS users are systematically granted access to the LOTUS cluster.


JASMIN
CEMS
jasmin-login1
jasmin-xfer1
cems-login1
cems-xfer1
SSH login gateway
Data transfers
SSH login gateway
Data transfers
firewall
firewall
jasmin-sci1
lotus.jc.rl.ac.uk
cems-sci1
CEMS-Academic cloud
Science/analysis
Batch processing cluster
Science/analysis
VM
GWS
/group_workspaces/jasmin/
/group_workspaces/cems/
Data Centre Archive
/badc
/neodc
Key:
General-purpose resources
Project-specific resources
Data centre resources

Login session

- Typical linux login session onto a dedicated VM from jasmin-login1:

- $ **exec ssh-agent $SHELL** *#starting ssh-agent session*
- $ **ssh-add ~/.ssh/id_rsa** *#adding ssh private key*
- $ <passphrase> #enter passphrase
- $ **ssh -A -X <userid>@jasmin-login1.ceda.ac.uk**
- *#logging to jasmin-login1, using –A to enable forwarding of the authentication agent connection so that the ssh-agent session is available to the intermediate server.*
- $ **ssh -X <userid>@<your virtual machine or jasmin-sci1.ceda.ac.uk>**
- *#Note that -X enables X11 forwarding and is optional*

NOTE: On Windows, use Pageant and PuTTY
Pageant is an SSH Authentication Agent for Windows. You can load your SSH private key(s) into Pageant and when you attempt to make external SSH connections using PuTTY, it will attempt to use those keys. Typically, you will use PuTTY to connect to a remote host via SSH.