

NCCS System Environment

COMPUTE

"Discover" Supercomputer

- 3,354 compute nodes
- 43,048 Intel Xeon processor cores
- 28,672 NVIDIA Tesla M2070 GPU streaming cores
- 28,800 Intel Xeon Phi coprocessor cores
(Many Integrated Core-MIC)
- InfiniBand interconnect
- 102.088 TB main memory
- 1.121 petaflops peak

STORAGE

Mass Storage Archive

- | | |
|------------------------|-------------------------------|
| <i>SGI Front-End</i> | <i>Oracle Hardware</i> |
| - Parallel DMF managed | - 37 PB capacity |
| - SGI Xeon Cluster | - T10K tape drives |
| - 960 TB disk | - 9310, SL8500 tape libraries |

Shared Storage

- 12.2 PB
- GPFS managed
- nobackup/scratch filesystems

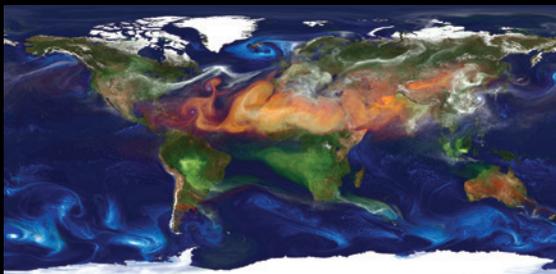
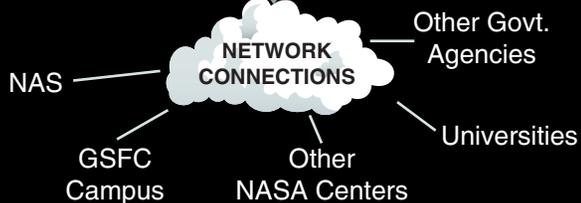
USER INTERFACE

Analysis & Visualization

- | | |
|---|----------------------------|
| <i>Dali: 272 Xeon cores; 24 NVIDIA Tesla M2070 GPUs with 10,752 "streaming GPU" CUDA cores; 4.3 TB memory</i> | <i>Software Tools</i> |
| | - ESGF/CDAT, IDL, ParaView |
| | - Matlab, GrADS, ferret |

Data Portal

- | | |
|---------------------------------|-----------------------|
| <i>HP Blade Server</i> | <i>Software Tools</i> |
| - 128 CPUs | - IDL, Matlab, GrADS |
| - 128 GB main memory | - ESGF Node |
| - 371 TB network storage (GPFS) | - Web services |
| - NFS served to compute hosts | - scp, ftp, bbftp |



For More Information:

Dr. W. Phillip Webster

NCCS Project
Computational and Information Sciences
and Technology Office
Code 606

NASA Goddard Space Flight Center
Greenbelt, MD 20771

<http://www.nccs.nasa.gov>

http://www.twitter.com/NASA_NCCS



National Aeronautics and
Space Administration



High-Performance Computing at Goddard Space Flight Center



NASA Center for Climate Simulation

www.nasa.gov

NCCS

Who We Are

The NASA Center for Climate Simulation (NCCS), located at NASA Goddard Space Flight Center, is a High-End Computing (HEC) facility that provides a range of supercomputing and data services to scientists throughout NASA's Science Mission Directorate (SMD). NCCS is part of the NASA HEC Program, together with its sister facility, the NASA Advanced Supercomputing (NAS) facility located at NASA Ames Research Center (ARC).

NCCS is funded by SMD. Scientists request supercomputing resources from NASA Headquarters as part of the scientific proposal process via programs such as ROSES, MAP, NEWS, AURA, etc. Based on the specific needs of each science project, SMD allocates NCCS and/or NAS hours depending on the types of computing services required.

Our User Community

NCCS supports modeling and analysis activities for SMD users in Earth, space, and solar research including:

- **Atmospheric modeling** for climate and weather research
- **Ocean modeling** for climate, chemistry, and biology
- **Land surface modeling** for agriculture, land use, and water resource management
- **Space and solar modeling** for fundamental physics and astronomy, space weather, and gravitational wave studies
- **Coupled models and systems of models** in support of collaborative science efforts
- **Observing system studies** to enhance the use and design of space instruments

NCCS Support Services

Computing

- Multiple large-scale high-performance clusters
- Tools for job scheduling & monitoring
- Portal to National Leadership Class System at NASA/ARC

Data Archival & Stewardship

- Large-capacity storage
- Tools to manage and protect data
- Data migration support

Code Development

- Environment for code development & test
- Code repository for collaboration
- Code porting & optimization support
- Earth System Modeling Framework (ESMF) assistance

Networks

- Internal NCCS high-speed interconnects for HEC components
- Center high-bandwidth access to NCCS for GSFC-based users
- Multi-gigabit network supports on-demand data transfers between NCCS and NAS

Analysis & Visualization

- Interactive analysis environment
- Software tools for image display
- Easy access to data archive
- Specialized data visualization support
- Data visualization wall

Data Sharing

- Capability to share data & results
- Supports community based development
- Facilitates data distribution and publishing

User Services

- Help Desk
- Account support
- User teleconferences
- Training & tutorials

