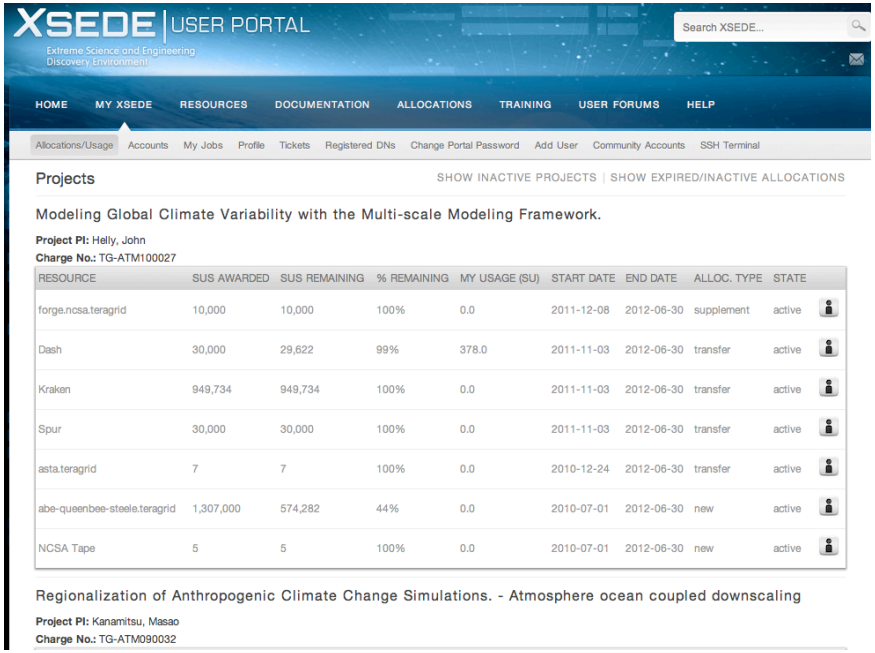
CIWG Breakout

CMMAP Winter Meeting, Ft. Lauderdale

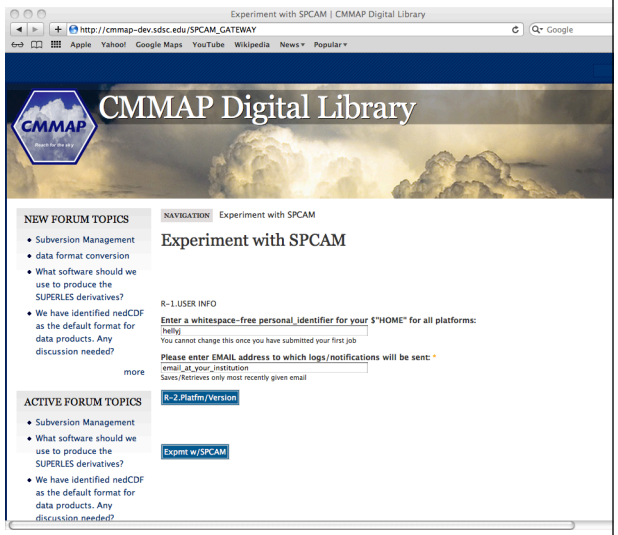
Outline

- Allocations and request schedule
- CMMAP Community Accounts on Kraken (moved from Steele)
- Digital Library Holdings
- Hugh Morrison's project
- Karen Schuchardt Parallel I/O Update
- Remote TB-scale Visualization
- GPU evaluation using Ross Heikes kernel

Allocations



CMMAP Community Portal for MMF



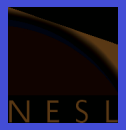
Sensitivity tests of the Multiscale Aerosol Climate Model using Teragrid resources

Hugh Morrison[1], Jack Ritchie[2], John Helly[2], Mike Pritchard[3], Minghuai Wang[4]

[1]NCAR
[2]SCRIPPS/UCSD
[3]SCRIPPS/UCSD/University of Washington
[4]PNNL

CMMAP meeting, Jan 10, 2012

#NCAR is sponsored by National Science Foundation



- Ongoing project with extension of large Teragrid allocation (though Jan 2012)

- Broadly, the goal is to investigate key sensitivities with the MACM to microphysics parameters and CRM configuration (e.g., grid spacing, domain size, etc.)

- Key science issues:
  - impact of microphysics (e.g., hail vs. graupel, 1-moment vs. 2-moment) and CRM configuration on deep convective characteristics, in particular propagating convection in central US (Pritchard et al. 2011)
  - poor simulation of precipitation frequency and distribution in global models of all scales (Stephens et al. 2010), which may be due in part to microphysics

Submission Schedule

You may submit requests to be reviewed in the following upcoming meetings:

REQUEST	SERVICE UNITS (SUS) RANGE (K=1000)	OPEN SUBMISSIONS	CLOSE SUBMISSIONS	ALLOCATIONS BEGIN	REVIEW CYCLE
New Startups (Not normally renewable)	Grand total limit of 200K See Hardware Resource Catalog for specific startup limits.	Year round	n/a	Usually 2-3 weeks after submitted	Year round
Educational (Renewable)	Grand total limit of 200K See Hardware Resource Catalog for specific educational limits.	Year round	n/a	Usually 2-3 weeks after submitted	Year round
Research	No SU limit	Dec. 15 Mar. 15 Jun. 15 Sept. 15	Jan. 15 Apr. 15 Jul. 15 Oct. 15	Apr. 1 Jul. 1 Oct. 1 Jan. 1	Quarterly

Resource Changes

- SDSC Dash, PSC Pople, NCSA Ember, LONI/QueenBee Resources Removed
  SDSC, New Trestles System, New Gordon Compute Cluster, New Gordon ION
  NCSA, Forge (Fermi) GPU System to replace Lincoln.
  More resource information can be found on the Resources Overview page

Support and Services

- Allocations
  - 2012 University ASD Call
    - University allocations
    - Climate Simulation Laboratory (CSL)
  - NCAR Allocations
  - Allocations Management
- Access and accounts
- Authentication and security
- Software
- Training
- CISL Portal
- Acknowledging NCAR/CISL
- Getting help
- User responsibilities

opportunities and more specific timelines will be announced in the coming months.

To better manage the resources available to the various CISL user communities, new allocation and accounting procedures will be rolled out to coincide with the upcoming NWSC requests. These new procedures are designed to make it easier for users to request and track their resource usage and to help support their associated data management plans. More information will be posted soon.

Accelerated Scientific Discovery (ASD)

The university community will have the opportunity to submit proposals for a limited number of large-scale, short-term projects to take advantage of the NWSC systems before the systems enter full production. The submission deadline is **March 5, 2012.** The University ASD Call for Proposals and submission instructions are now available. Approximately 70 million core-hours will be available for University ASD requests. *Note:* NCAR-led projects have a comparable ASD opportunity through the NCAR Strategic Capability (NSC) program.

Climate Simulation Laboratory (CSL)

The Climate Simulation Laboratory (CSL) at NCAR is a dedicated climate model computing facility, supported by the multiagency US Global Change Research Program, that targets large-scale, long-running simulations of the Earth's climate system. The CSL deadline for submissions for the next round is **February 20, 2012**. Approximately 250 million core-hours over 18 months will be available to CSL projects. The submission guidelines and a link to submission form is on the Climate Simulation Laboratory web page.

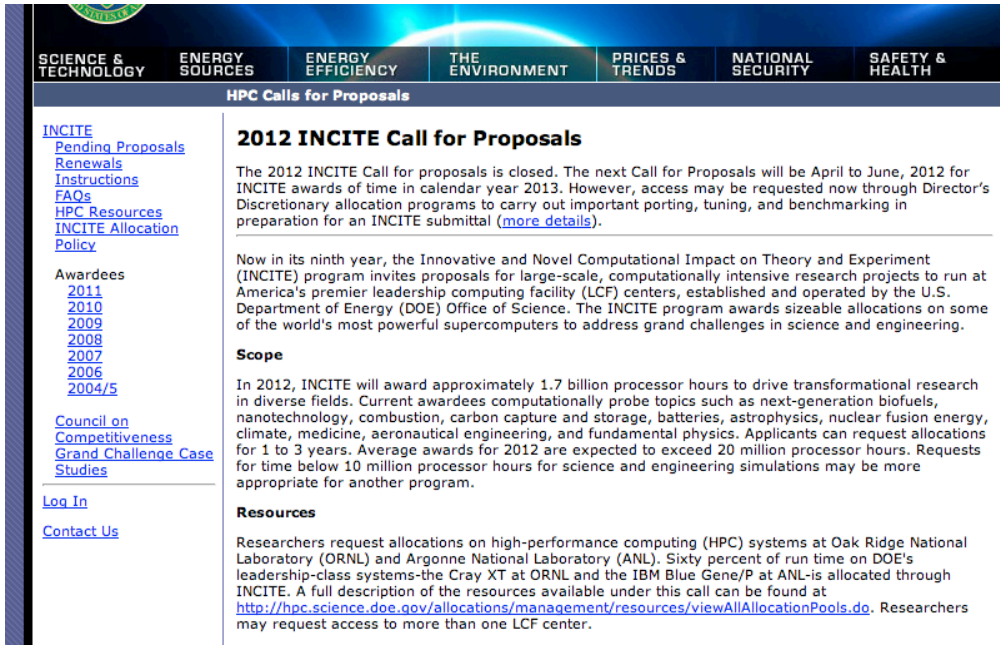
Eligibility. The CSL is open to all Principal Investigators funded or supported by a U.S. university, U.S. federal or state agency, or U.S. not-for-profit research laboratory. CSL requests must satisfy additional eligibility criteria for use of this facility.

University Community

NCAR provides computing resources to the university community for investigations beyond the scope of university computing centers. University researchers currently have access to NCAR's Bluefire system, the new University of Colorado-NCAR Janus Cluster, CISL's data analysis and visualization clusters, and archival storage system. Please see the University allocations page for details.

The CHAP will be accepting Yellowstone allocation requests during the spring allocation cycle. The deadline is **March 26, 2012**. More than 80 million core-hours will be allocated during each semi-annual CHAP allocation cycle.

Eligibility. In general, any U.S.-based researcher with an NSF award in the atmospheric or closely related sciences is eligible to apply for a University Computing allocation. There are some limited opportunities for those without NSF awards.


SCIENCE & TECHNOLOGY
ENERGY SOURCES
ENERGY EFFICIENCY
THE ENVIRONMENT
PRICES & TRENDS
NATIONAL SECURITY
SAFETY & HEALTH
HPC Calls for Proposals
INCITE
Pending Proposals
Renewals
Instructions
FAQs
HPC Resources
INCITE Allocation Policy
Awardees
2011
2010
2009
2008
2007
2006
2004/5
Council on Competitiveness Grand Challenge Case Studies
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2012 INCITE Call for Proposals
The 2012 INCITE Call for proposals is closed. The next Call for Proposals will be April to June, 2012 for INCITE awards of time in calendar year 2013. However, access may be requested now through Director's Discretionary allocation programs to carry out important porting, tuning, and benchmarking in preparation for an INCITE submittal (more details).
Now in its ninth year, the Innovative and Novel Computational Impact on Theory and Experiment (INCITE) program invites proposals for large-scale, computationally intensive research projects to run at America's premier leadership computing facility (LCF) centers, established and operated by the U.S. Department of Energy (DOE) Office of Science. The INCITE program awards sizeable allocations on some of the world's most powerful supercomputers to address grand challenges in science and engineering.
Scope
In 2012, INCITE will award approximately 1.7 billion processor hours to drive transformational research in diverse fields. Current awardees computationally probe topics such as next-generation biofuels, nanotechnology, combustion, carbon capture and storage, batteries, astrophysics, nuclear fusion energy, climate, medicine, aeronautical engineering, and fundamental physics. Applicants can request allocations for 1 to 3 years. Average awards for 2012 are expected to exceed 20 million processor hours. Requests for time below 10 million processor hours for science and engineering simulations may be more appropriate for another program.
Resources
Researchers request allocations on high-performance computing (HPC) systems at Oak Ridge National Laboratory (ORNL) and Argonne National Laboratory (ANL). Sixty percent of run time on DOE's leadership-class systems-the Cray XT at ORNL and the IBM Blue Gene/P at ANL-is allocated through INCITE. A full description of the resources available under this call can be found at http://hpc.science.doe.gov/allocations/management/resources/viewAllAllocationPools.do. Researchers may request access to more than one LCF center.

Digital Library Holdings

```
NeptuneStonesteps.local:~/work/SLR002/src/bin>ils
/cmmap001/home/cmmap/model_runs:
  INSTALL.txt
  C- /cmmap001/home/cmmap/model_runs/CMMAP_AMIP
  C- /cmmap001/home/cmmap/model_runs/CMMAP_MACM_EXP01
  C- /cmmap001/home/cmmap/model_runs/CMMAP_SAM6.7SR_OUT2D
  C- /cmmap001/home/cmmap/model_runs/CMMAP_SAM6.7SR_OUT3D_com3D
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NeptuneStonesteps.local:~/work/SLR002/src/bin>
```

Thanks to Jack Ritchie and Hugh Morrison

```
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  C- /cmmap001/home/cmmap/model_runs/CMMAP_MACM_EXP01/z_MP32_2MW12
NeptuneStonesteps.local:~/work/SLR002/src/bin>
```

Keeneland

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GETTING STARTED | SOFTWARE | HARDWARE | JOBS | ABOUT

Quick Links

- Support
  - Quick Start Guide
  - Batch Scripts
  - Compiling
  - Scheduling
- Getting A New Account
- Publications
- Presentations
- Keeneland in the News
- Open positions
- Acknowledgements for Keeneland Resources

Events

- 2011-11-14 Keeneland Tutorial at SC11
- 2011-04-14 Keeneland Workshop at GT

Keeneland Partners

Georgia Tech | NICS | Oak Ridge National Laboratory | UT

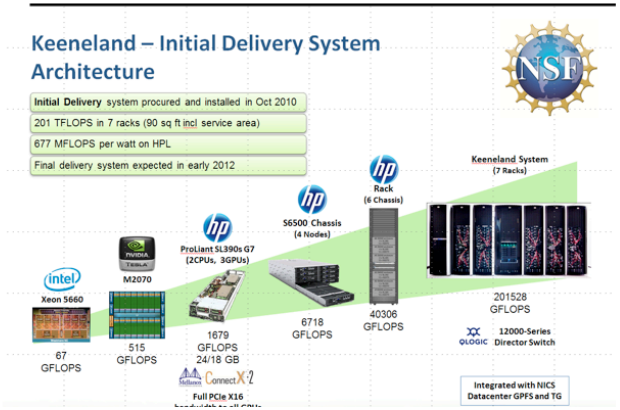
Home

Hardware

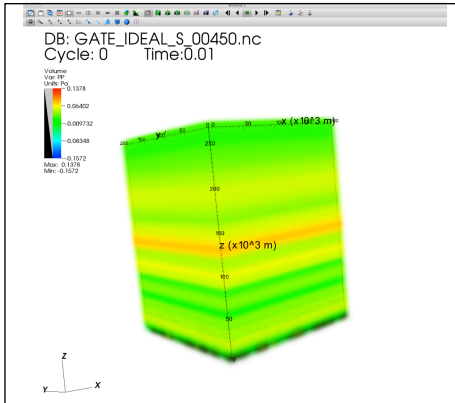
GPU System / Part of NICS

Keeneland Initial Delivery System (KIDS)

In 2010, the Keeneland project procured and deployed its initial delivery system (KIDS): a 201 Teraflop, 120-node HP SL390 system with 240 Intel Xeon CPUs and 360 NVIDIA Fermi graphics processors, with the nodes connected by an InfiniBand QDR network. KIDS is being used to develop programming tools and libraries in order to ensure that the project can productively accelerate important scientific and engineering applications. The system is also available to a select group of users to port and tune their codes to a scalable GPU-accelerated system.



Remote Visualization of GigaLES MMF Run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0.009732
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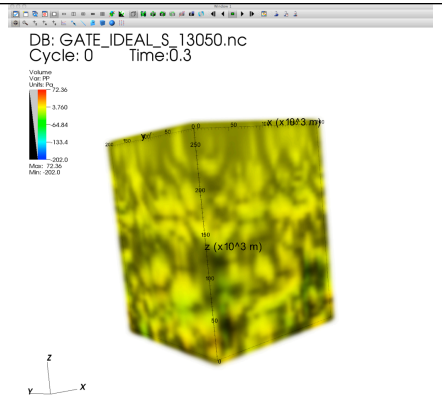
Max: 0.1378
Min: -0.1572
x (x10^3 m)
z (x10^3 m)
Z
Y
X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Units: Pa
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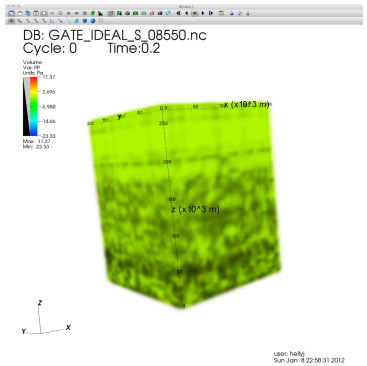
-133.4
-202.0
Max: 72.36
Min: -202.0
x (x10^3 m)
z (x10^3 m)
Z
Y
X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Volume
Var: PP
Units: Pa
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2.696
-5.980
-14.66
-23.33
Max: 11.37
Min: -23.33
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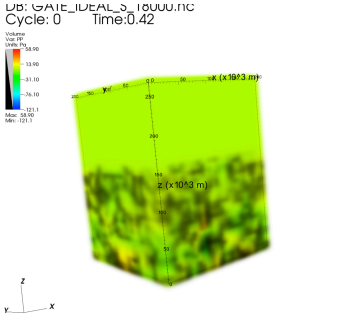
z (x10^3 m)
Z
Y
X
user: hellyj
Sun Jan 8 22:58:31 2012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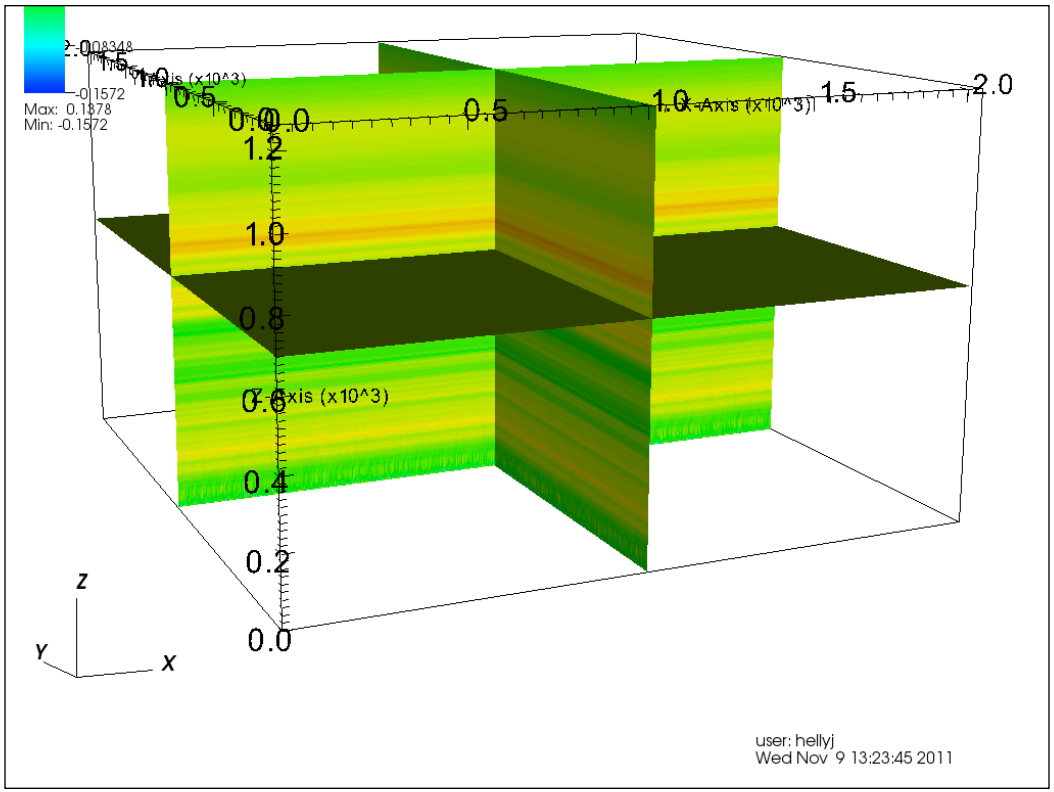
-76.10
-121.1
Max: 58.90
Min: -121.1
x (x10^3 m)
z (x10^3 m)
Z
Y
X
user: hellyj
Sun Jan 8 23:00:03 2012

user: hellyj
Sun Jan 8 22:59:20 2012


Max: 0.1878
Min: -0.1572
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0.5
1.0
1.5
2.0
X-Axis (x10^3)
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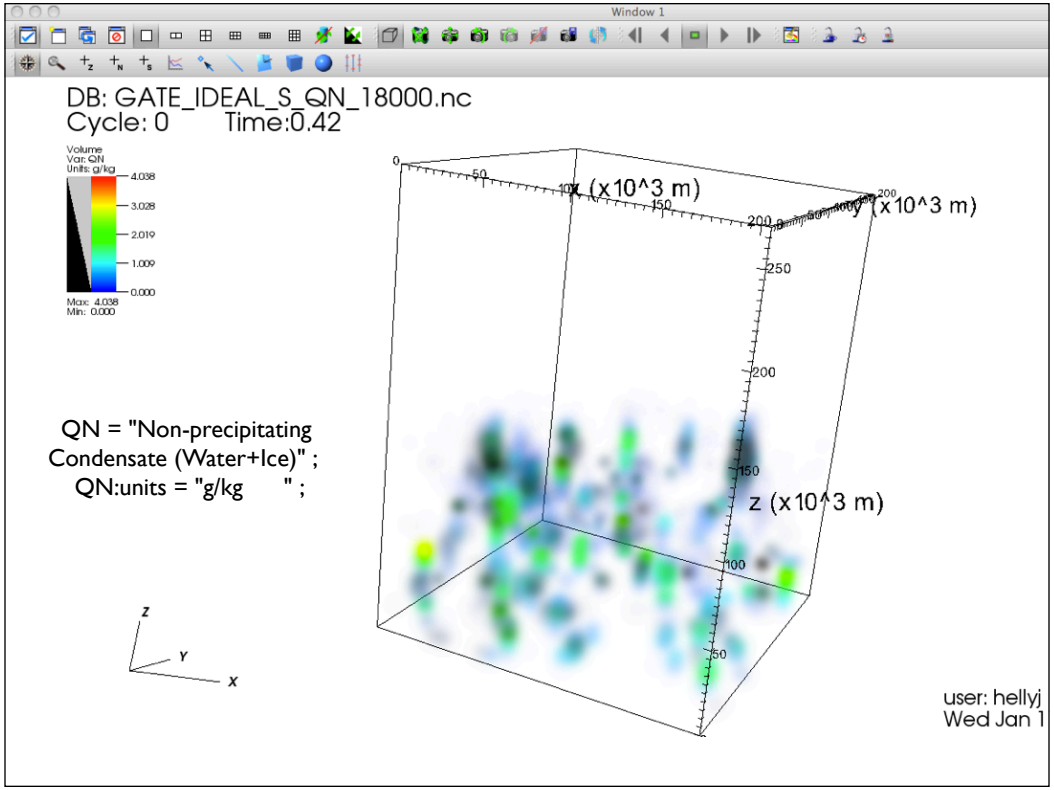
1.0
0.8
0.6
0.4
0.2
0.0
Z-Axis (x10^3)
Z
Y
X
user: hellyj
Wed Nov 9 13:23:45 2011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Var: QN
Units: g/kg
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3.028
2.019
1.009
0.000
Max: 4.038
Min: 0.000
QN = "Non-precipitating Condensate (Water+Ice)" ;
QN:units = "g/kg " ;
x (x10^3 m)
y (x10^3 m)
z (x10^3 m)
Z
Y
X
user: hellyj
Wed Jan 1

CMMAP Data Services Update

Karen Schuchardt
Ft Lauderdale
January 2012

Pacific Northwest
NATIONAL LABORATORY

Outline

- Zgrid IO
- Visualization (Visit) Update
- Pagoda Update
- Geodesic Data Model Update
- IO Agent

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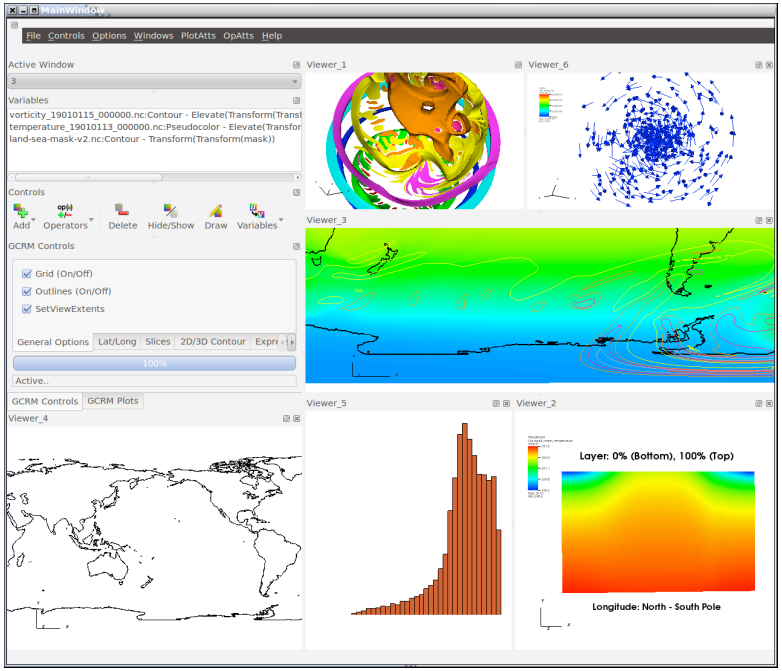
Visit – Climate Skin Prototype



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Pagoda 0.6

NCO	Pagoda
ncks	pgsub
ncra	pgra
ncea	pgea
ncwa	(soon, v0.7)
ncbo	pgbo
ncflint	pgflint
ncrcat	(soon v0.7)
ncecat	(soon v0.7)
ncrename	
ncatted	NA*
ncpdq	
ncap/ncap2	

* Not a parallel operation

- Fully data parallel
- Output verified against NCO
  - Tested GCRM data
    - 4 km (in progress and painful)
  - Tested against ANL data
    - 1/8 degree CAM HOMME
    - 19 8.5GB files (15 variables each)
    - 19 2.5GB files (4 variables each)
  - Assumes NCO infallible
- Scriptable (but not as simple)
- Plan to incorporate ESMF parallel gridder
- Working on schemes to improve parallel reads – promising but deferring
- Practical considerations have led us to add ncrat and ncecat

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CMMAP MIP?

- Benchmark cases for GCRM and comparative models (e.g., MMF in aqua-planet?)
- Which physics in each? (GCRM vs MMF)
- Additional testing with Arakawa's unified parameterization
- Coupled Atmos-Ocean with newer physics or MACM in coupled mode