Matthew R. Norman
Computational Scientist/Climate Liaison
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Education and Training

2011	North Carolina State University, Dissertation Title: "Characteristics-Based Methods for Efficient Parallel Integration of the Atmospheric Dynamical Equations," Atmospheric Science PhD
2008	North Carolina State University, Thesis Title: "Investigation of Higher-Order Accuracy for a Conservative Semi-Lagrangian Discretization of the Atmospheric Dynamical Equations," Atmospheric Science, MS
2006	North Carolina State University, Computer Science, BS (Magna Cum Laude)
2006	North Carolina State University, Meteorology with minor in Mathematics, BS (Magna Cum Laude, Honors)

Research and Professional Experience

2011 - Now	Computational Scientist/Climate Liaison. National Center for Computational Science, Oak Ridge National Laboratory
2005 - 2007	Climate Data Mining. Climate Modeling Laboratory, North Carolina State University
2006 - 2008	Development of Efficient Climate Model Transport Schemes. Institute for Mathematics Applied to Geosciences, National Center for Atmospheric Research
2006 - 2008	Analysis of Semi-Lagrangian Time Discretizations. Climate Modeling Laboratory, North Carolina State University
2008 - 2011	Development of Scalable Atmospheric Methods. Institute for Mathematics Applied to Geosciences, National Center for Atmospheric Research; Climate Modeling Laboratory, North Carolina State University
Summer, 2009	Fixing a parameterization in the Community Climate System Model (CCSM). Computational Earth Sciences, Oak Ridge National Laboratory

Hardware Platforms & Climate Models. Experience with large parallel platforms (e.g., Jaguar XT5), multiple hardware devices (GPUs, Cell BE, Multi-core CPUs, Distributed Memory Clusters), and compiling, running, and coding for a broad range of atmospheric models.
Software Environment / Development. OpenMP, MPI, R, CUDA, Matlab, Maple, NCL (NCAR Command Language), C/C++, Fortran (77/90/95), Java, Gnuplot, familiarity with various parallel / MPI tracer tools, versioning tools, and effective software development practices.

Publications

1. F. H. M. Semazzi, J. S. Scroggs, G. A. Pouliot, A. L. McKee-Burrows, Matthew Norman, V. Poojary, and Y.-M. Tsai. 2005. On the Accuracy of Semi-Lagrangian Numerical Simulation of Internal Gravity Wave Motion in the Atmosphere. *Journal of the Meteorological Society of Japan* 83: 851-869.
2. Norman, Matthew. 2008. Investigation of Higher-Order Accuracy for a Conservative Semi-Lagrangian Discretization of the Atmospheric Dynamical Equations. Master's Thesis, North Carolina State University.
3. Norman, Matthew and R. Nair. 2008. Inherently Conservative Non-Polynomial Based Remapping Schemes: Application to Semi-Lagrangian Transport. *Monthly Weather Review* 136: 5044-5061.

4. Norman, Matthew, F. H. M. Semazzi, and R. D. Nair 2009. Conservative Cascade Interpolation on the Sphere: An Intercomparison of Various Non-Oscillatory Reconstructions. *Quarterly Journal of the Royal Meteorological Society* 135: 795-805.
5. Norman, Matthew, R. D. Nair, and F. H. M. Semazzi. 2010. A Low Communication and Large Time Step Explicit Finite-Volume Solver for Non-Hydrostatic Atmospheric Dynamics. *Journal of Computational Physics* 230: 1567-1584.

Awards

1. Summer Internships in Parallel Computational Science (SIParCS): Summer, 2007
2. Cha-Cha Days: October 19-21, 2007
3. Numerical Techniques for Global Atmospheric Models: June 2-13, 2008
4. National Center for Atmospheric Research Advanced Study Program Graduate Visitor: June 2008 – March 2009
5. Department of Energy Computer Science Graduate Fellowship: August 2008 – present
6. Global Atmospheric Solvers for Next-Generation Weather and Climate Models: September 23-24, 2008
7. DOE CSGF Practicum at Oak Ridge National Laboratory: April 15 – July 31, 2009
8. Solutions of Partial Differential Equations on the Sphere: April 27-30, 2009
9. Frontiers of Geophysical Simulation: August 18-20, 2009
10. Summer Graduate School on Mathematics of Climate Change: July 12-23, 2010
11. SuperComputing 2010: November 13-19, 2010

Graduate and Postdoctoral Advisors

PhD Advisor: Dr. Fredrick H. M. Semazzi (North Carolina State University, Raleigh, NC)
Master's Advisor: Dr. Fredrick H. M. Semazzi (North Carolina State University, Raleigh, NC)