

Cécile Hannay

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EDUCATION

- Jul 2001 **Master's degree in Atmospheric Science. University of Alaska Fairbanks.**
Thesis: Single Column Model Simulations of Arctic Cloudiness and Surface Radiative Fluxes during the SHEBA Experiment.
- Sep 1990 **Aggregation in Physics and Mathematics (Teaching degree). University of Liège, Belgium.**
- Jul 1990 **Licence in Physics. University of Liège, Belgium.**
Thesis: Paradoxes resulting from the Irreversibility in Physics.
- Sep 1985 **Candidature in Sciences of Education. University of Liège, Belgium.**

PROFESSIONAL EXPERIENCE

- Since 2004 **Associate Scientist III**, National Center for Atmospheric Research, Boulder.
- 2001-2004 **Associate Scientist**, Climate Diagnostics Center, Boulder.
- 1999-2001 **Research Assistant**, University of Alaska, Fairbanks.
- 1990-1998 **Associate Scientist**, University of Liège, Belgium.

SCIENTIFIC AND TECHNICAL ACCOMPLISHMENTS

Since 2007: **Atmospheric Model Working Group (AMWG) Science Liaison**

- Support model activities conducted for the AMWG (100+ person activity).
- Support development of the Community Atmospheric Model (CAM).
- Share CAM development results with the community (through webpages and presentations at conferences/workshops).
- Simulations and analysis of climate runs and short-term forecasts to assess new parameterizations in CAM.
- Implementation and testing of scientific code for analysis and simulations.
- Assist the CESM community in all aspects of using the CAM (running the model, science questions, experiments designs).
- Maintenance of the AMWG diagnostics tools.
- Preparation and teaching of CESM and CAM tutorials at NCAR and other institutions (Los Alamos, Stockholm, Taipei).

2004-2007: **Liaison of the Climate Process Team (CPT) on Low Latitude Cloud Feedbacks**

- Responsible for coordination and support of climate simulations for the CPT on Low Latitude Cloud Feedbacks.
- Responsible for forecasts simulations and detailed analysis to assess various cloud regimes in climate models.
- Detailed comparison of the NCAR and GFDL models in subsidence regimes.
- Share CPT progress with the participants/community (through webpages and presentations at conferences/workshops).

2001- 2004: **Sub-grid scale variability of cloud water in large-scale models**

- Detailed analysis of Cloud Resolving Model (CRM) simulations of deep convection to characterize internal variability of clouds and water.
- Simulation of shallow convection cloud fields with a Large Eddy Simulation (LES) model.
- Study of 3D radiative transfer effects using Monte Carlo computations.
- Climate model simulations with the GFDL model.
- Design, implementation and testing of scientific code for analysis and simulations, in Fortran 90.

1999-2001: **Simulation of Arctic clouds**

- Simulations of Arctic climate with the Single-Column Model of the Community Climate Model (CCM3)
- Evaluation of cloud parameterization over the Arctic and sensitivity studies to cloud microphysics.
- Designed scripts in Matlab and GrADS for climatological data analysis and model output analysis.
- Designed, wrote and tested programs in C, Fortran on Unix workstation and PC.

1990-1998: **Experimental physics**

- Implementation and testing of a test bench for calorimetric studies of electric vehicle's batteries.
- Recording and analysis of absorption spectra.
- Design and implementation of a texturing method of superconductors in a magnetic field.

TEACHING AND OUTREACH

- 2013 Coordinator and Lecturer, CESM and CAM Tutorial, Taipei, March 25-29, 2013.
- 2012 Science Mentor for the Earth Explorers Project (<http://earthexplorers.org/>), Partnership between the NCAR Outreach and Trail Ridge Middle School in Longmont, September-December 2012
- 2012 Lecturer and Coordinator of the boy scout's field trip to NCAR. Boulder, October 21, 2012.
- 2012 Lecturer and Practical Coordinator, CESM Tutorial, Stockholm, Sweden, May 14-31 2012.
- 2011 Coordinator and Lecturer, CESM and CAM Tutorial, Los Alamos, April 25-29, 2011

HONORS/AWARDS

- 2012 CGD Special Recognition Award for outstanding accomplishment in Community Earth System Model (CESM) Tutorial.
- 2012 Nominee for the UCAR Education and Outreach Award for Community Earth System Model (CESM) Tutorial.
- 2009 CGD Incentive Award for outstanding accomplishment in supporting the CAM5 release.

PUBLICATIONS

In Preparation:

Neale, R. B., C. Hannay, G. Danabasoglu, D. M. Lawrence, J. Kay, M. Holland, A. Gettelman, S Park, P Rasch, S Ghan, X Liu and M Zhang. Coupled simulation from CESM1 using the Community Atmosphere Model version 5 (CAM5) In preparation, To be submitted to J Climate

Rasch P, R Neale, C Hannay et al. The Community Atmosphere Model Version 5 (CAM5), In preparation, To be submitted to J Climate

Submitted:

Xiao, H, R Mechoso, R Sun, J Han, H-L Pan, S Park, C Hannay, C Bretherton, J Teixeira (2013) Diagnosis of the Marine Low Cloud Simulation in the NCAR Community Earth System Model (CESM) and the NCEP Global Forecast System (GFS). Submitted for publication in Climate Dynamics.

Yoon J-H, P J Rasch, K Balaguru, C Hannay, and B Singh (2013) The Role of the Oceanic heat transport on Arctic Sea Ice change in the 20th Century. Submitted for publication in GRL.

Zhang M et al., (2013). CGILS: First Results from an International Project to Understand the Physical Mechanisms of Low Cloud Feedbacks in General Circulation Models. Submitted for publication in BAMS.

Published:

Lindvall J, G Svensson, C Hannay (2013). Evaluation of near-surface parameters in the two versions of the 2 atmospheric model in CESM1 using flux station observations. J. Climate, 26, 26-44.

Medeiros B, D L Williamson, C Hannay, J Olson. (2012) Southeast Pacific stratocumulus in the Community Atmosphere Model. J. Climate, 25, 6175-6192.

Liu, X., Easter, R. C., Ghan, S. J., Zaveri, R., Rasch, P., Shi, X., Lamarque, J.-F., Gettelman, A., Morrison, H., Vitt, F., Conley, A., Park, S., Neale, R., Hannay, C., Ekman, A. M. L., Hess, P., Mahowald, N., Collins, W., Iacono, M. J., Bretherton, C. S., Flanner, M. G., and Mitchell, D. (2012). Toward a minimal representation of aerosol direct and indirect effects: model description and evaluation *Geosci. Model Dev. Discuss.*, 4, 3485-3598

Teixeira J, et al. (2011) Tropical and sub-tropical cloud transitions in weather and climate prediction models: the GCSS/WGNE Pacific Cross-section Intercomparison (GPCI). *J. Climate*, 24, 5223-5256.

Wyant, M. C., Wood, R., Bretherton, C. S., Mechoso, C. R., Bacmeister, J., Balmaseda, M. A., Barrett, B., Codron, F., Earnshaw, P., Fast, J., Hannay, C., Kaiser, J. W., Kitagawa, H., Klein, S. A., Köhler, M., Manganello, J., Pan, H.-L., Sun, F., Wang, S., and Wang, Y. (2009) The PreVOCA Experiment: Modeling the lower troposphere in the Southeast Pacific. *Atmos. Chem. Phys. Discuss.*, 9, 23909-23953.

Hannay C, D L Williamson, J J Hack, J T Kiehl, J G Olson, S A Klein, C S Bretherton, and M Koehler (2009), Evaluation of Forecasted Southeast Pacific Stratocumulus in the NCAR, GFDL and ECMWF Models. *J. Climate*, 22, 2871-2889.

Mapes, B E J Bacmeister, M Khairoutdinov, C Hannay, M Zhao (2009), Virtual Field campaigns on deep tropical convection in climate models. *J. Climate*, 22, 244-257.

Pincus R, C Hannay, and K F Evans (2005), The accuracy of determining three-dimensional radiative transfer effects in cumulus clouds using ground-based profiling instruments, *Journal of the Atmospheric Sciences*, 62, 2284-2293.

Pincus R, C Hannay, S A Klein, and K-M Xu (2005), Overlap assumptions for assumed-PDF cloud schemes in large scale models, *Journal of Geophysical Research*, doi:10.1029/2004JD005100

Klein S A, R Pincus, C Hannay, and K-M Xu (2005), How might a statistical cloud scheme be coupled to a mass-flux convection scheme ?, *Journal of Geophysical Research*, doi:10.1029/2004JD005017.

Hannay C, R Pincus, K. F Evans (2004), Estimating Three-Dimensional Cloudy Radiative Transfer Effects from Time-Height Cross Sections, Fourteenth ARM Science Team Meeting, March 22 to 26, 2004, Albuquerque, New Mexico.

Jakob C, R Pincus, C Hannay, and K-M Xu (2004), The use of cloud radar observations for model evaluation: A probabilistic approach, *Journal of Geophysical Research*, doi:10.1029/2003JD003473.

Hannay C and U S. Bhatt (2002) Simulations of Arctic Cloudiness. *Global Glimpses*, Volume 10, No. 1.

PRESENTATIONS

Cécile Hannay, Mark Taylor, Peter Lauritzen, Sungsu Park, Julio Bacmeister, Joe Tribbia, Rich Neale, (2013), Update on CAM development. Recent activities and near-term priorities. Atmosphere Model Working Group (AMWG) Meeting, Boulder, 11-13 February, 2013.

Cécile Hannay (2013), Recent CAM activities. CGD Research Reports, Boulder, 24 January, 2013.

Cécile Hannay (2012), Update on CAM and the AMWG. Recent activities and near-term priorities. SSC meeting Boulder, 31 October, 2012.

Cécile Hannay, Rich Neale and Julio Bacmeister (2012), High resolution simulations with CAM: Sensitivity of precipitation to model resolution and its implication for climate change studies. 17th Annual CESM Workshop, Breckenridge, 18-21 June 2012

Cécile Hannay, Rich Neale and Julio Bacmeister (2012), Running CAM at High Resolution. What does the resolution buy us ? Summer school on Climate Modeling, University of Stockholm, Stockholm, 28 May 2012.

Cécile Hannay (2012), Running CESM: An overview. Summer school on Climate Modeling, University of Stockholm, Stockholm, 21 May 2012.

Cécile Hannay, Rich Neale and Julio Bacmeister (2012), Running CAM at High Resolution. What does the resolution buy

us ? CGD Research Reports, Boulder, 23 February 2012.

Cécile Hannay, Rich Neale and Julio Bacmeister (2012), Timeslice Experiments at High Resolution. What does the resolution buy us ? AMWG Meeting, Boulder, 1-3 February 2012.

Cécile Hannay et al. (2012), What's new in the AMWG diagnostics package ? AMWG Meeting, Boulder, 1-3 February 2012.

Cécile Hannay, Rich Neale and Julio Bacmeister (2012), High Resolution Climate Simulations with the Community Atmospheric Model (CAM) AMS 92th meeting, New Orleans, 22-26 January 2012.

Cécile Hannay and Rich Neale (2011), AMWG simulations. 16th CESM Workshop, Breckenridge, 20 - 23 June 2011

Cécile Hannay, Rich Neale, Andrew Gettelman, Jennifer Kay, Sungsu Park, Xiaohong Liu, Steve Ghan, Phil Rasch, and Jinho Yoon (2011), The CAM5.1 release and coupled simulations. 16th CESM Workshop, Breckenridge, 20 - 23 June 2011

Cécile Hannay (2011), Atmospheric modeling and the Community Atmospheric Model (CAM) CESM tutorial, Los Alamos, April 25-29, 2011.

Cécile Hannay and Rich Neale (2011), CESM1-CAM5.1 degree coupled simulations CGD Research Reports. March 24, 2011

Cécile Hannay and Rich Neale (2011), CESM1-CAM5.1 degree coupled simulation. AMWG Meeting, Boulder, 14-16 February 2011

Cécile Hannay, Dave Williamson, Rich Neale, Jerry Olson, Dennis Shea (2011), Evaluating Community Atmospheric Model (CAM) forecasts against satellite data along the GCSS Pacific cross-section. AMS 91st Meeting, Seattle, 23-27 January 2011

Cécile Hannay, Dave Williamson, Rich Neale, Jerry Olson, Dennis Shea (2010), Evaluating the Community Atmospheric Model (CAM) against satellite data during YOTC. AGU Fall Meeting, San Francisco, 13-17 December, 2010

Cécile Hannay (2010), Standalone simulations: CAM3, CAM4 and CAM5. 15th Annual CESM Workshop, Breckenridge, June 28 - July 1, 2010

Cécile Hannay, Minghua Zhang, and John Truesdale (2010), Single Column Simulations: Preliminary results for CAM4 and CAM5. CGILS Meeting, Stony Brook, Long Island, March 1-2, 2010

Cécile Hannay, Dave Williamson, Rich Neale, Jerry Olson, and Dennis Shea (2010), Evaluating parameterized variables in the Community Atmospheric Model along the GCSS Pacific cross-section. AMWG Meeting, Boulder, February 10-12, 2010

Cécile Hannay et al. (2010), CAM standalone development simulations. AMWG Meeting, Boulder, February 10-12, 2010

Cécile Hannay, Dave Williamson, Rich Neale, Jerry Olson, and Dennis Shea (2009), Evaluating parameterized variables in the Community Atmospheric Model along the GCSS Pacific cross-section during YOTC. AGU Fall Meeting, San Francisco, December 14-18, 2009

Cécile Hannay, Dave Williamson, Jerry Olson, Rich Neale, Sungsu Park and Phil Rasch (2009) Water vapor budgets in Track 1 and Track 5. CCSM Meeting, June 15-18, 2009, Breckenridge, Colorado.

Cécile Hannay et al (2009), An overview of recent CAM developments. AMWG Meeting, March 2-4 2009, Boulder, Colorado.

Cécile Hannay, Dave Williamson, Jerry Olson, Chris Bretherton, Sungsu Park, Matt Wyant and Martin Koehler (2008), Using satellite and in-situ observations to evaluate short-term forecasts of cloud-topped boundary layers with the Community Atmospheric Model. AGU Fall meeting, 15-19 December 2008, San Francisco, California.

Cécile Hannay, Dave Williamson, Jerry Olson, Rich Neale, Yaga Richter, Andrew Gettelman, Hugh Morrison, Sungsu Park, Chris Bretherton and Joao Teixeira (2008), Evaluating parameterized variables in CAM forecasts against satellite data

along the GCSS Pacific cross-section. AGU Fall meeting, 15-19 December 2008, San Francisco, California.

Cécile Hannay (2008), Challenges in the tuning of the CAM. CGD Research Reports, December 4 2008, Boulder, Colorado.

Cécile Hannay, Dave Williamson, Jerry Olson, Rich Neale, Andrew Gettelman, Hugh Morrison, Sungsu Park and Chris Bretherton (2008), Short Term forecasts along the GCSS Pacific Cross-section: Evaluating new Parameterizations in the Community Atmospheric Model. 13th Annual CCSM Workshop, 17-19 June 2008, Breckenridge, Colorado.

Cécile Hannay, Dave Williamson, Jerry Olson, Rich Neale, Andrew Gettelman, Hugh Morrison, Sungsu Park and Chris Bretherton (2008), Short Term forecasts along the GCSS Pacific Cross-section: Evaluating new Parameterizations in the Community Atmospheric Model. 4th PAN-GCSS Meeting on advances in modeling and observing clouds and convection, 2-6 June 2008, Toulouse, France.

Cécile Hannay (2007), Forecasts of Southeast Pacific Stratocumulus with the NCAR, GFDL and ECMWF Models. CGD Research Reports, November 11 2007, Boulder, Colorado.

Cécile Hannay, Dave Williamson, Jim Hack, Jeff Kiehl, Jerry Olson, Chris Bretherton, Steve Klein and Martin Koehler (2007), Forecasts of the East Pacific Investigation of Climate (EPIC) column with the NCAR, GFDL and ECMWF Models, 12th Annual CCSM Workshop, 19-21 June 2007, Breckenridge, Colorado.

Cécile Hannay, Dave Williamson, Jim Hack, Jeff Kiehl, Jerry Olson, Chris Bretherton, Steve Klein and Martin Koehler (2007), Forecasts of Southeast Pacific Stratocumulus with the NCAR, GFDL and ECMWF Models, 3rd WGNE Workshop on Systematic Errors in Climate and NWP Models, February 12-16, 2007, San Francisco, California.

Cécile Hannay, Dave Williamson, Jerry Olson, Jim Hack and Jeff Kiehl (2007), Sensitivity to the CAM candidate schemes in climate and forecast runs along the Pacific Cross-section, CCSM Atmosphere Model Working Group (AMWG) Meeting, 29-31 January 2007, NCAR, Boulder, Colorado.

Cécile Hannay, Jeff Kiehl, Dave Williamson, Jerry Olson, Jim Hack, Richard Neale and Chris Bretherton (2006), Sensitivity to the PBL and convective schemes in forecasts with CAM along the Pacific Cross-section, Joint GCSS-GPCI/BLCL-RICO Workshop, 18-21 September 2006, NASA/GISS, New York.

Cécile Hannay, Jeff Kiehl, Dave Williamson, Jerry Olson, Jim Hack, and Chris Bretherton (2006), Forecast simulations of Southeast Pacific Stratocumulus with CAM3 and CAM3-UW. 11th Annual CCSM Workshop, 20-22 June 2006, Breckenridge, Colorado.

Cécile Hannay (2006), Forecast runs for a Pacific Cross-section. CGD Research Reports, January 19 2006, Boulder, Colorado.

Cécile Hannay, Jeffrey Kiehl, James Hack, Ping Zhu and Karen Shell (2005), Cloud diagnostics in subsidence regions: comparison of the NCAR and GFDL models versus observations and reanalysis, 3rd PAN-GCSS meeting on Clouds, Climate and Models, 16-20 May 2005, Athens, Greece.

Cécile Hannay, Robert Pincus, K. Frank Evans (2004), Estimating Three-Dimensional Cloudy Radiative Transfer Effects from Time-Height Cross Sections, Fourteenth ARM Science Team Meeting, March 22 to 26, 2004, Albuquerque, New Mexico.

Cécile Hannay, Uma S. Bhatt, Jerry Harrington (2001) Single-Column Model Simulations of Arctic Cloudiness and Surface Radiative Fluxes during the Surface Energy Budget of Arctic (SHEBA) experiment. Proceedings of the Fifth Conference on Polar Meteorology and oceanography, May 14-18, 2001, San Diego, California.

TUTORIALS

Cécile Hannay (2012), Atmosphere Modeling II: Physics.
CESM Tutorial, National Center for Atmospheric Research, Boulder, CO, 30 July - 3 August 2012

Cécile Hannay (2012), CESM: Namelist and Code modifications.

CESMTutorial, National Center for Atmospheric Research, Boulder, CO, 30 July - 3 August 2012

Rich Neale and Cécile Hannay (2012), CAM exercises.

CESM Tutorial, National Center for Atmospheric Research, Boulder, CO, 30 July - 3 August 2012

Cécile Hannay (2012), Running CESM: An overview.

Introduction to Climate Modelling, Stockholm University, Stockholm, Sweden, May 14-31 2012.

Christine Shields and Cécile Hannay (2012), CESM: Customizing a CESM experiment.

Introduction to Climate Modelling, Stockholm University, Stockholm, Sweden, May 14-31 2012.

Cécile Hannay (2012), CESM: Namelist and Code modifications.

Introduction to Climate Modelling, Stockholm University, Stockholm, Sweden, May 14-31 2012.

Adam Phillips and Cécile Hannay (2012), CESM: Output and diagnostics.

Introduction to Climate Modelling, Stockholm University, Stockholm, Sweden, May 14-31 2012.

Cécile Hannay (2011), CESM: Namelist and Code modifications.

CESM Tutorial, National Center for Atmospheric Research, Boulder, CO, 1-5 August 2011

Cécile Hannay and Dave Lawrence (2011), Running the Community Land Model (CLM).

CESM Tutorial, Los Alamos, April 25-29, 2011

Cécile Hannay (2011), Running the Community Atmospheric Model (CAM).

CESM Tutorial, Los Alamos, April 25-29, 2011

Cécile Hannay (2010), CESM: Namelist and Code modifications.

CCSM Tutorial, National Center for Atmospheric Research, Boulder, CO, 12-16 July 2010

Cécile Hannay (2009), Customizing the CAM output: the built-namelist utility.

Community Atmosphere Model (CAM) Tutorial, National Center for Atmospheric Research, Boulder, CO, July 27-31, 2009