

## **Dr. Jennifer E. Kay**

National Center for Atmospheric Research (NCAR)  
Climate and Global Dynamics (CGD)  
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### ***Education***

#### ***2006, Ph.D., University of Washington (UW) Earth and Space Sciences***

*Dissertation:* "Physical controls on cirrus cloud inhomogeneity"

*Committee:* Dr. M. Baker (co-chair), Dr. D. Hegg (co-chair), Dr. T. Ackerman, Dr. Q. Fu, Dr. A. Gillespie

#### ***2002, M.S., UW, Geological Sciences***

*Thesis:* 'Characterization of snowpack properties on Mt. Rainier, WA with MASTER multi-spectral data';  
'Estimation of water temperatures from airborne and satellite thermal-infrared remote-sensing data'

*Committee:* Dr. A. Gillespie (chair), Dr. S. Burges, Dr. S. Warren

#### ***1999, B.A. Magna Cum Laude with Honors, Brown University, Economics and Geological Sciences***

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### ***Scientific Research Experience***

#### **2007-present, Postdoctoral Fellow, NCAR CGD**

#### **2008-present, Affiliate Faculty, Colorado State University, Atmospheric Sciences**

- Quantified the contribution of cloud and weather pattern anomalies to the record-breaking 2007 Arctic sea ice loss using A-train satellite and ground-based atmospheric observations
- Assessing atmospheric forcing and feedbacks associated with rapid sea ice loss events using observations and a climate model in a data assimilation facility (CAM-DART)
- Evaluating new climate model cloud and aerosol parameterizations using satellite observations

#### **2003-2006, Doctoral Research, UW Cloud Physics Group, UW Program on Climate Change**

- Investigated aerosol and dynamical controls on cirrus cloud optical properties
- Developed a state-of-the-art parcel model with binned ice microphysics
- Assessed evidence for surface-initiated homogeneous freezing of supercooled water

#### **2000-2002, Masters of Science Research, UW W. M. Keck Remote Sensing Lab**

- Evaluated accuracy and utility of water temperatures derived from thermal infrared imagery
  - Estimated snowpack properties with remote-sensing data, radiative transfer modeling, and field data
  - Maintained the atmospheric correction algorithm for a multi-spectral imaging radiometer (ASTER)
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### ***Climate Impacts and Policy Experience***

#### **2005-2006, Consultant, UW Climate Impacts Group**

- Summarized impacts of projected climate change on Pacific Northwest resources
- Co-wrote manual to help regional governments prepare for projected climate change

#### **2006, Scholarship Attendee, American Meteorological Society's Summer Policy Colloquium**

- Participated in 10-day short course in atmospheric policy held in Washington, DC

#### **1999-2000, Analyst, Charles River Associates, Washington DC**

- Organized and analyzed economic data for legal clients and regulatory policy makers

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## **Honors**

- Arctic cloud feedback work featured in American Geophysical Union (AGU) press conference, NASA press release, NSIDC press release, and joint AGU/NCAR press release (2007-2008)
- Atmospheric Radiation Measurement (ARM) Science Team Meeting Poster Award (2008)
- UW David A. Johnston Memorial Fellowship for excellence in graduate research (2005)
- Kay et al. (2003a) highlighted in European Geophysical Union (EGU)'s journal watch (2003)
- UW Peter Misch Graduate Research Fellowship (2002)
- Brown University Geological Sciences Senior Award (1999)

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## **Teaching and Mentoring**

- Committee Member for Aaron Schwartz, CSU Masters Student (2007-present)
- Semester-long course on university teaching philosophy and methods (2006, UW)
- Substitute lecturer for undergraduate course on cloud physics (2006, UW)
- Guest lecturer in space physics and landscape architecture courses (2005-2006, UW)
- Participated in NSF-sponsored *Preparing for an Academic Career Workshop* (2003, Stanford)
- Teaching assistant for undergraduate courses on environmental remote sensing (2001, UW), planetary geology (1997-1999, Brown), and geochemistry (1999, Brown)

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## **Service**

- Organizing committee for NCAR Thompson Lecture Series, invited Dr. Inez Fung (2007-present)
- Paper reviews for: *GRL*, *JGR-ATM*, *ACP*, *RSE*, and *TGRS*.
- Proposal reviews for NASA (panel), NSF (mail) and DOE (mail)
- Session Chair and Program Committee, UW Graduate Student Climate Conference (2006)

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## **Proposals**

- NASA ROSES Modeling, Analysis, and Prediction Program: Evaluation and improvement of Arctic atmosphere variability and feedbacks in climate models (\$250K/year, in prep w/ Dr. A. Gettelman)
- UW ESS seed research grant to study snow processes in the Washington Cascades (\$1K, 2003)

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## **Publications (by topic)**

### **Arctic Sea Ice Loss**

**Kay, J. E.**, T. L'Ecuyer, A. Gettelman, G. Stephens, and C. O'Dell (2008), The contribution of cloud and radiation anomalies to the 2007 Arctic sea ice extent minimum, *Geophys. Res. Lett.*, 35, L08503, doi:10.1029/2008GL033451.

### **Ice Cloud Microphysics and Aerosol Indirect Effects**

**Kay, J. E.** and R. Wood (2008), Timescale analysis of aerosol sensitivity during homogeneous freezing and implications for upper tropospheric water vapor budgets, *Geophys. Res. Lett.*, 35, L10809, doi:10.1029/2007GL032628..

**Kay, J. E.**, M. Baker, and D. Hegg (2007), Physical controls on orographic cirrus inhomogeneity, *Atmospheric Chemistry and Physics*, 7, 3771-3781.

**Kay, J. E.**, M. Baker, and D. Hegg (2006), Microphysical and dynamical controls on cirrus cloud optical depth distributions, *Journal of Geophysical Research*, 111, D24205, doi:10.1029/2005JD006916.

**Kay, J. E.**, V. Tsemekhman, B. Larsen, M. Baker, and B. Swanson (2003a). Comment on evidence for surface-initiated homogeneous nucleation, *Atmospheric Chemistry and Physics*, 3, 1439-1443.

### **Climate Impacts and Adaptation Strategies**

Snover, A.K., L. Whitely Binder, J. Lopez, E. Willmott, **J. E. Kay**, D. Howell, and J. Simmonds, (2007). *Preparing for Climate Change: A Guidebook for Local, Regional, and State Governments*. In association with and published by ICELEI – Local Governments for Sustainability, Oakland, CA.

**Kay, J. E.**, J. H. Casola, and A. K. Snover (2005). Primers on climate change and climate impacts research prepared for King County (Washington) by the Climate Impacts Group, Center for Science in the Earth System, Joint Institute for the Study of the Atmosphere and Ocean, University of Washington, Seattle.

Available at: <http://www.cses.washington.edu/cig/outreach/workshops/kc2005.shtml>

Casola, J.H., **J. E. Kay**, A.K. Snover, R.A. Norheim, L.C. Whitely Binder and the Climate Impacts Group (2005). *Climate Impacts on Washington's Hydropower, Water Supply, Forests, Fish, and Agriculture*. A report prepared for King County (Washington) by the Climate Impacts Group (Center for Science in the Earth System, Joint Institute for the Study of the Atmosphere and Ocean, University of Washington). Available at:

<http://www.cses.washington.edu/cig/outreach/workshops/kc2005.shtml>

### **Remote Sensing and Field Observations of Surface Hydrology**

**Kay, J. E.**, Snow density observations in the Washington Cascades (2006). *Proceedings of the 74<sup>th</sup> Western Snow Conference*, Las Cruces, NM, 12 pp.

**Kay, J. E.**, A.R. Gillespie, G.B. Hansen, and E. Pettit (2003). Spatial relationships between snow contaminant content, grain size, and surface temperature from multi-spectral images of Mt. Rainier, Washington (USA), *Remote Sensing of Environment*, 86:2, 216-231.

**Kay, J. E.**, S.K. Kampf, R. Handcock, A.R. Gillespie, K. Cherkauer, and S.J. Burges (2005). Accuracy of lake and stream temperatures estimated from thermal infrared imagery, *Journal of the American Water Resources Association*, 41 (5), 1161-1175.

Cherkauer, K.A., S.J. Burges, R.N. Handcock, **J. E. Kay**, S.K. Kampf and A.R. Gillespie, (2005). Assessing satellite-based thermal-infrared remote-sensing for monitoring Pacific Northwest river temperatures, *Journal of the American Water Resources Association*, 41 (5), 1149-1160.

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### ***Recent Talks***

**Kay, J. E.**. The contribution of cloud and radiation anomalies to the 2007 Arctic sea ice loss. 1) *ARM Science Team Meeting Plenary Session*, Norfolk, VA, March, 2008 (INVITED); 2) *Yale University*, New Haven, CT, Feb. 2008 (INVITED); 3) *Climate and Global Dynamics Seminar* Boulder, CO, Feb., 2008; 4) *University of Buenos Aires*, Buenos Aires, Argentina, Dec. 2007 (INVITED).

**Kay, J. E.**, Gettelman, A., and H. Morrison. Using A-Train observations to constrain and improve Arctic cloud parameterizations. *AGU Fall Meeting*, San Francisco, CA, Dec. 2007 (INVITED).

**Kay, J. E.**, , Aerosol sensitivity in cirrus clouds and implications for the ice crystal deposition coefficient, *Swiss Federal Institute of Technology (ETH)*, Zurich, Switzerland, Oct. 2007 (INVITED).

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### ***Upcoming Meetings***

**Kay, J. E.**. Using CAM-DART to investigate the 2007 atmospheric forcing on sea ice loss. *PAN-GCSS* in Toulouse, France, June 2008, and *CCSM Workshop* in Breckenridge, CO, June 2008.