

ALICE K. DUVIVIER

Associate Scientist II, University Corporation for Atmospheric Research
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EDUCATION

UNIVERSITY OF COLORADO Boulder, CO
Ph.D., Atmospheric and Oceanic Sciences, 2015
M.S., Atmospheric and Oceanic Sciences, 2012

THE COLORADO COLLEGE Colorado Springs, CO
B.A., Physics, Magna Cum Laude, 2008

RESEARCH EXPERIENCE

2017-pres. **Associate Scientist II:** University Corporation for Atmospheric Research (UCAR), Boulder, CO.
Sea Ice and Polar climate modeling. Evaluate and test sea ice (CICE) parameterizations and polar climate in the Community Earth System Model (CESM). Create documentation, develop code, and act as liaison for Polar Climate Working Group and CICE Consortium. Supervisor: Dr. David Bailey.

2016-2017 **Postdoctoral Researcher:** University Corporation for Atmospheric Research (UCAR), Boulder, CO.
Southern Ocean climate modeling. Evaluated simulated mixed layer compared to observations. Tested and amended model parameterizations of surface forced near-surface mixing. Supervisor: Dr. William Large.

2016 **Participant:** Sea Ice Camp, Barrow, AK.
Participant in targeted workshop to bring together researchers in sea ice modeling and observations. Included field observations on sea ice around Barrow.

2012-2016 **Professional Research Assistant:** Cooperative Institute for Research in Environmental Sciences (CIRES), Boulder, CO.
Regional climate modeling and data analysis of the Arctic Climate System. Focused on the atmospheric surface layer over land, ocean, and sea ice and atmosphere-ocean energy fluxes. Supervisor: Dr. John Cassano

2010-2012 **Graduate Research Assistant:** University of Colorado, Boulder, CO.
Analysis of model, satellite, and in-situ data of atmosphere-ocean interactions around Greenland during extreme wind events. Adviser: Dr. John Cassano.

2012 **Antarctic Field Assistant:** McMurdo Station, Antarctica.
Repaired and tested automatic weather station and flew Small Unmanned Meteorological Observer (SUMO) planes to sample boundary layer.

2009 **Student Research Assistant:** National Oceanic and Atmospheric Administration (NOAA), Boulder, CO.

- Analyzed remote-sensing observations of atmospheric boundary layer. Supervisor: Dr. Arlyn Andrews.
- 2008 **Summer Intern:** Colorado State University, Fort Collins, CO.
Icosahedral numerical approximations. Adviser: Dr. David Randall.
- 2007 **Research Assistant:** The Colorado College, Colorado Springs, CO.
Operated Atomic Force Microscope to analyze microchips. Supervisor: Dr. Kristine Lang.
- 2007 **Intern:** National Institute of Standards and Technology (NIST), Boulder, CO.
Developed laser instrumentation to measure biological temperature changes.
Supervisor: Dr. Ralph Jimenez.
- 2005 **Intern:** National Oceanic and Atmospheric Administration (NOAA), Boulder, CO.
Analyzed ocean sediment core to understand paleoclimate wind shifts in the Indian Summer Monsoon. Supervisor: Dr. David Anderson.

PEER REVIEWED PUBLICATIONS

Meehl, G.A., J.M Arblaster, C. Chung, M.M. Holland, **A.K. DuVivier**, L. Thompson, D. Yang, C.M. Bitz (2019): Sustained ocean changes contributed to sudden Antarctic sea ice retreat in late 2016. *Nature communications*, **10**, 14, <https://doi.org/10.1038/s41467-018-07865-9>.

DuVivier, A.K, W.G. Large, R.J. Small (2018), Argo observations of the Deep Mixing Band in the Southern Ocean: A salinity modeling challenge, *Journal of Geophysical Research: Oceans*, <https://doi.org/10.1029/2018JC014275>.

Brunke, M.A., J.J. Cassano, N. Dawson, **A.K. DuVivier**, W. J. Gutowski, J. Hamman, W. Maslowski, B. Nijssen, J.R. Erye, J. Renteria, A. Roberts, X. Zeng (2018): Evaluation of the atmosphere-land-ocean-sea ice interface processes in the Regional Arctic System Model Version 1 (RASM) using local and globally gridded observations. *Geoscientific Model Development*. <https://doi.org/10.5194/gmd-2018-104>

Cassano, J.J., **A.K. DuVivier**, A. Roberts, M. Hughes, M. Seefeldt, M. Brunke, A. Craig, B. Fisel, W. Gutowski, J. Hamman, M. Higgins, W. Maslowski, B. Nijssen, R. Osinski, X. Zeng (2017): Development of the Regional Arctic System Model (RASM): Near Surface Atmospheric Climate Sensitivity. *Journal of Climate*. <https://doi.org/10.1175/JCLI-D-15-0775.1>.

DuVivier, A.K, J. J. Cassano, S.Greco, G.D. Emmitt (2017), A Case Study of Observed and Modeled Barrier Flow in the Denmark Strait in May 2015, *Monthly Weather Review*, <https://doi.org/10.1175/MWR-D-16-0386.1>.

Hamman, J., B. Nijssen, M. Brunke, J. Cassano, A. Craig, **A.K. DuVivier**, M. Hughes, D. Lettenmaier, W. Maslowski, R. Osinski, A. Roberts, X. Zeng (2016), Land Surface Climate in the Regional Arctic System Model, *Journal of Climate*, <https://doi.org/10.1175/JCLI-D-15-0415.1>.

DuVivier, A.K., J. J. Cassano, A. P. Craig, J. Hamman, W. Maslowski, B. Nijssen, R. Osinski, and A. Roberts (2016), Winter atmospheric buoyancy forcing and oceanic response during strong wind events around southeastern Greenland in the Regional Arctic System Model (RASM) for 1990-2010, *Journal of Climate*, *29*, 975–994, <https://doi.org/10.1175/JCLI-D-15-0592.1>.

DuVivier, A.K., J.J. Cassano, (2015): Comparison of wintertime mesoscale winds over the ocean around southeastern Greenland in WRF and ERA-Interim. *Climate Dynamics*, *46*(7), 2097-2211, <https://doi.org/10.1007/s00382-015-2697-8>

DuVivier, A.K., J.J. Cassano, (2015): Exploration of turbulent heat fluxes and wind stress curl in WRF and ERA-Interim during wintertime mesoscale wind events around southeastern Greenland. *Journal of Geophysical Research: Atmospheres*, **120**, 3593-3609. <https://doi.org/10.1002/2014JD022991>

Roberts, A., A. Craig, W. Maslowski, R. Osinski, **A. DuVivier**, M. Hughes, B. Nijssen, J.J. Cassano, M. Brunke, (2014). Simulating transient ice-ocean Ekman transport in the Regional Arctic System Model and Community Earth System Model. *Annals of Glaciology*, **69**, <https://doi.org/10.3189/2015AoG69A760>

DuVivier, A.K., and J. Cassano (2013). Evaluation of WRF model resolution on simulated mesoscale winds and surface fluxes near Greenland. *Monthly Weather Review*, **141**, 941-963. <https://doi.org/10.1175/MWR-D-12-00091.1>

Anderson, D., C. Baulcomb, **A. DuVivier**, A. Gupta, (2010). Indian Summer Monsoon During the Last Two Millennia. *Journal of Quaternary Science*, **25**, 911-917, <https://doi.org/10.1002/jqs.1369>

MANUSCRIPTS IN REVIEW or IN PREPARATION

Small, R.J., **A.K. DuVivier**, D. Whitt, M.C. Long, I. Grooms, and W.G. Large. On the control of Subantarctic stratification by the ocean circulation. (In-review at *Climate Dynamics*).

Large W.G., E.G. Patton, **A.K. DuVivier**, P.P. Sullivan, L. Romero. Similarity theory in the surface layer of large-eddy simulations of the wind, wave, and buoyancy force Southern Ocean. (In-review at *Journal of Physical Oceanography*).

Huang, Y., X. Dong, D. Bailey, M. Holland, B. Xi, **A.K. DuVivier**, J. Kay, L. Landrum, Y. Deng. Thicker clouds and accelerated Arctic sea ice decline: The atmosphere-sea ice interactions in spring. (In review at *Geophysical Research Letters*).

DuVivier, A.K., P. DeRepentigny, M.M. Holland, M. Webster, J.E. Kay, D. Perovich. Going with the Floe: tracking CESM Large Ensemble sea ice floes provides context for observed ice conditions. (In preparation for *Geophysical Research Letters*).

DuVivier, A.K., M.M. Holland, D. Bailey, J.E. Kay, A. Gettleman, S. Tilmes. Arctic and Antarctic sea ice in the Community Earth System Model (CESM) version 2 and impacts of atmospheric forcing. (In preparation for Journal of Geophysical Research – Oceans)

Roberts, A.F, **A.K. DuVivier**, A.K. Turner, K.N. Bench, J.D. Wolfe, W. Maslowski, S.L. Farrell, E.C. Hunke, R. Osinski. Evaluating Coupled Sea Ice Models using an Altimetric Satellite Emulator. (In preparation for Journal of Geophysical Research – Oceans).

Harrison, C., **A.K. DuVivier**, E. Maroon. Global marine and sea ice impacts of simulated nuclear winter. (In preparation for Science).

OTHER WRITING

A.K. DuVivier and E.C. Hunke. Community driven sea ice modeling with the CICE Consortium. *Witness the Arctic*. June 2018

Lazzara, M.A., L.J. Welhouse, J.E. Thom, J.J. Cassano, **A.K. DuVivier**, G.A. Weidner, L.M. Keller, and L. Kalnajs, (2012): Automatic weather station (AWS) program 2011-2012 field season report. *Antarctic Record*.

HONORS AND AWARDS

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| 2014 | Certificate in College Teaching: Graduate Teacher Program, University of Colorado, Boulder, CO |
| 2009-2012 | NOAA/CIRES Graduate Student Fellowship: University of Colorado, Boulder, CO |
| 2012 | Best Talk in CIRES Graduate Student Seminar Series: University of Colorado, Boulder, CO |
| 2011 | Atmospheric and Oceanic Sciences Travel Grant for <i>On the Cutting Edge</i> Professional Development Workshop: University of Colorado, Boulder, CO |
| 2010 | Best Should Teach Silver Award: Graduate Teacher Program, University of Colorado, Boulder, CO |
| 2008 | Phi Beta Kappa |
| 2008 | Outstanding Physics Student: The Colorado College, Colorado Springs, CO |
| 2004-2008 | Dean's List: The Colorado College, Colorado Springs, CO |
| 2004-2008 | Colorado College Scholar – Scholarship: The Colorado College, Colorado Springs, CO |
| 2007 | Venture Grant – <i>What Makes a Scientist? The life of Geologist James Hutton</i> : The Colorado College, Colorado Springs, CO |
| 2004 | AP Scholar with Distinction |

SELECTED PRESENTATIONS AND POSTERS

DuVivier, A.K., M.M. Holland, D. Bailey, T. Krumpen, C. Harrison: Using the CESM large ensemble to explore sea ice conditions possible during the MOSAiC field experiment. *2018 AGU Annual Meeting – oral presentation*. Washington, DC, December 2018.

DuVivier, A.K., E.C. Clare, A. Craig, D. Bailey: CICE-Consortium Town Hall: Sea Ice Model Development for and by the Community. *2018 AGU Annual Meeting – town hall*. Washington, DC, December 2018.

DuVivier, A.K.: Overview of near surface winds near the Labrador Sea. *2018 CESM annual meeting – oral presentation*. Boulder, CO, June 2018.

DuVivier, A.K., W.G. Large, R.J. Small: The impact of subsurface salinity structure on deep mixed layer development in the Southern Ocean. *2018 Ocean Sciences – oral presentation*. Portland, OR, February 2018.

DuVivier, A.K., W.G. Large, G. Danabasoglu, E. Patton, P. Sullivan, M. Levy: Investigating Southern Ocean Mixed Layer Biases. *OMWG working Group meeting – oral presentation*. Boulder, CO, February 2017.

DuVivier, A.K.: Modeled air-sea interactions around southeastern Greenland. *CGD Seminar*. Boulder, CO, October 2016.

DuVivier, A.K., J.J. Cassano, A. Craig, J. Hamman, W. Maslowski, B. Nijssen, R. Osinski, A. Roberts: Winter oceanic response during strong wind events around southeastern Greenland in the Regional Arctic System Model (RASM) for 1990-2010. *2016 Ocean Sciences Meeting*. New Orleans, LA, February 2016.

DuVivier, A.K., J.J. Cassano: Analysis of wintertime mesoscale winds and their impact on the oceans around southeastern Greenland. *High Latitude Dynamics Workshop*. Rosendal, Norway, March 2015.

DuVivier, A.K. and J.J. Cassano: Wintertime mesoscale winds and their impact on the oceans around southeastern Greenland. *ESRL Physical Sciences Division Seminar*. Boulder, CO, February 2015.

DuVivier, A.K., J.J. Cassano, M. Hughes, S. Knuth, and A. Roberts: Using WRF in the coupled Regional Arctic System Model (RASM): sensitivity to atmospheric processes. *2014 WRF User's Workshop*. Boulder, CO, July 2014.

DuVivier, A.K., J.J. Cassano, R. Osinski, A. Roberts, T. Craig, W. Maslowski, J. Clement-Kinney: Modeled oceanic response to realistic atmospheric forcing during extreme mesoscale events around Greenland. *12th annual polar AMS meeting*. Seattle, WA, April 2013.

DuVivier, A.K. and J.J. Cassano: How do mesoscale winds around Greenland impact the ocean? *CIRES Graduate Student Seminar Series*. Boulder, CO, October 2012.

DuVivier, A.K. and J.J. Cassano: Evaluation of WRF model resolution on simulated mesoscale winds and surface fluxes near Greenland. *International Polar Year Conference*. Montreal, Canada, April 2012.

DuVivier, A.K. and J.J. Cassano: The effect of WRF resolution: case study of an easterly tip jet off Cape Farewell, Greenland. *American Geophysical Union Annual Meeting*. San Francisco, CA, December 2011.

DuVivier, A.K. and J.J. Cassano: Understanding the effects of model resolution on winds and surface fluxes for an easterly tip jet during the Greenland Flow Distortion Experiment. *11th annual Polar AMS Meeting*. Boston, MA, May 2011.

DuVivier, A.K.: Reconstruction of the Southwest Asian Monsoon. *Colorado Springs Undergraduate Research Forum*, Colorado Springs, CO, April 2006.

OTHER EXPERIENCE

- 2017-2018 **Writing Mentor:** SOARS Undergraduate Research Program, Boulder, CO
Mentored two summer interns in the Significant Opportunities in Atmospheric Sciences and Research program designed as an undergraduate-to-graduate bridge program for underrepresented groups in the earth sciences.
- 2017-2018 **Instructor:** Community Earth System Modeling (CESM) Tutorials, Boulder, CO
Presented sea ice modeling lecture to attendees of the annual CESM tutorial and assisted in laboratory exercises to practice climate modeling. Planning committee for a specialized CESM polar modeling tutorial for early career scientists, and developed lesson focusing on simplified atmosphere, ocean, sea ice, and land model components.
- 2014 **Visiting Instructor:** The Colorado College, Colorado Springs, CO
Taught upper-level undergraduate atmospheric physics and dynamics. Prepared inquiry-focused activities and assessments, and advised student course projects.
- 2012 **Instructor:** University of Colorado, Boulder, CO
Prepared and presented lectures, exams, projects, homework, in class activities for intensive month-long introductory summer course on weather and the atmosphere.
- 2010-2011 **Lead Graduate Teaching Assistant:** University of Colorado, Boulder, CO
Created departmental teaching assistant training, led workshops on incorporating scientific inquiry in courses, videotaped and consulted with graduate students.
- 2009-2010 **Teaching Assistant:** University of Colorado, Boulder, CO
Prepared, taught, and graded material for atmospheric science courses.
- 2005-2008 **Tutor:** The Colorado College, Colorado Springs, CO

Helped individuals and groups of students improve problem solving for all levels of undergraduate physics, mathematics, chemistry, and biology. Assisted individuals in improving writing, particularly scientific writing.

2004-2008 **Cool Science Co-President/Member:** The Colorado College, Colorado Springs, CO
Developed and presented scientific concepts and demonstrations to K-12 students.

OUTREACH

NCAR Super Science Saturday volunteer (2016, 2018)
Panelist, ATOC "Careers at National Labs" (2018)

PROFESSIONAL SERVICE

NCAR Early Career Scientists Executive Committee (09/2018)
AMS Polar Meteorology and Oceanography Committee Member – (11/2015-present)
University of Colorado Atmospheric and Oceanic Sciences Department:
Curriculum Committee (2011-2014), Course Fees Committee (2013-2014), Written
Comprehensive Exam Student Committee Member (2011), Space Committee (2012-2013),
Departmental Lead Teaching Assistant (2010-2011), Student Representative to Faculty
Meetings (2009-2010).
Journal Manuscript Reviewer:
Journal of Glaciology, Journal of Climate, Polar Research, Quarterly Journal of the Royal
Meteorological Society, Geophysical Research Letters, Ocean Modeling, Scientific
Reports, International Journal of Climatology, International Panel on Climate Change
Special Issue for Ocean and Cryosphere,

PROFESSIONAL SOCIETY MEMBERSHIPS

American Geophysical Union (AGU), American Meteorology Society (AMS), Arctic Research
Consortium of the United States (ARCUS), Association of Polar Early Career Scientists (APECS)