MARIE C. MCGRAW

Postdoctoral Research Associate, Department of Atmospheric Science ⋄ University of Washington

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EDUCATION

Ph.D., Atmospheric Science — October 2015-March 2019
Colorado State University, Fort Collins, CO
Advisor: Elizabeth A. Barnes
Dissertation: "A Causal Discovery-Based Approach to Understanding Arctic-Midlatitude Dynamics"

M.S., Atmospheric Science — August 2013 - October 2015
Colorado State University, Fort Collins, CO
Advisor: Elizabeth A. Barnes
Thesis: "Seasonal Sensitivity of the Eddy-Driven Jet Response to Tropospheric Heating in an Atmospheric General Circulation Model"

B.Sc., Mechanical Engineering — August 2008 - June 2012
Massachusetts Institute of Technology, Cambridge, MA

RESEARCH EXPERIENCE

Postdoctoral Research Associate, Ice Climate Group — June 2019 - Present
Atmospheric Science, University of Washington, Seattle, WA
Advisors: Cecilia M. Bitz and Eduardo Blanchard-Wrigglesworth

Graduate Research Assistant — June 2013 - May 2019
Atmospheric Science, Colorado State University, Fort Collins, CO
Advisor: Elizabeth A. Barnes

PUBLICATIONS

UNDER REVIEW

McGraw, M.C., E. Blanchard-Wrigglesworth, R.P. Clancy, and C.M. Bitz: Understanding the predictability of Arctic sea ice loss on subseasonal timescales. submitted to *Journal of Climate* 04/2021.

Gonzalez, A.O., I. Ganguly, **M.C. McGraw**, and J. Larson: Rapid dynamical evolution of ITCZ events over the east Pacific, submitted to *Journal of Climate* 03/2021.

Clancy, R.P., C.M. Bitz, E. Blanchard-Wrigglesworth, **M.C. McGraw**, and S. M. Cavallo: Drivers of asymmetric patterns in the atmosphere and sea ice during Arctic cyclones, submitted to *Journal of Climate* 01/2021.

PUBLISHED

McGraw, M.C. and E.A. Barnes (2020): New Insights on Subseasonal Arctic-Midlatitude Causal Connections from a Regularized Regression Model. *Journal of Climate*, doi:10.1175/JCLI-D-19-0142.1.

McGraw, M.C., C.F. Baggett, C. Liu, and B.D. Mundhenk (2019): Changes in Arctic moisture transport over the North Pacific associated with sea ice loss. *Climate Dynamics*, doi:10.1007/s00382-019-05011-9.

Samarasinghe, S., **M.C. McGraw**, E.A. Barnes, and I. Ebert-Uphoff (2019): A study of links between the Arctic and the midlatitude jet-streams using Granger and Pearl causality. *Environmetrics,* doi:10.1002/env.2540.

McGraw, M.C., and E.A. Barnes (2018): Memory matters: A case for Granger causality in climate variability studies. *J. Climate*, **31,** doi:10.1175/JCLI-D-17-0334.1.

Woollings, T., E. Barnes, B. Hoskins, Y.-O. Kwon, R.W. Lee, C. Li, E. Madonna, **M. McGraw**, T. Parker, R. Rodrigues, C. Spensberger, K. Williams (2018): Daily to decadal modulation of jet variability. *J. Climate*, **31,** doi:10.1175/JCLI-D-17-0286.1.

Samarasinghe, S., **M. McGraw,** E. Barnes, and I. Ebert-Uphoff (2017): A study of causal links between the Arctic and the midlatitude jet-streams. *Proceedings of the Seventh International Workshop on Climate Informatics (CI 2017), NCAR Technical Note NCAR/TN-536+PROC.*

McGraw, M.C., E.A. Barnes, and C. Deser (2016): Reconciling the observed and modeled Southern Hemisphere circulation response to volcanic eruptions. *Geophys. Res. Lett.,* doi:10.1002/2016GL069835.

McGraw, M.C., and E.A. Barnes (2016): Seasonal sensitivity of the eddy-driven jet to tropospheric heating in an idealized AGCM. *J. Climate*, **29,** doi:10.1175/JCLI-D-15-0723.1.

SKILLS AND TRAINING

Research expertise: Large scale atmospheric and climate dynamics, climate variability and climate change, uncertainty quantification, statistical and data science modeling.
Programming/Software: Python (including xarray, pandas, statsmodels, seaborn, cartopy); Jupyter notebooks, Git.
Data Analysis: Experienced with large multi-dimensional geospatial datasets (including CMIP5 model output, climate model large ensemble simulations, ensemble forecast model output, and reanalysis; and formats like netCDF and GRIB); experienced with statistical modeling and data science analyses.

SELECTED PRESENTATIONS

McGraw, M.C., E. Blanchard-Wrigglesworth, R.P. Clancy, C.M. Bitz: Extreme Sea Ice Loss on Subseasonal Timescales in S2S Forecast Models. Poster presentation: American Geophyiscal Union Annual Meeting, 12/2020 (remote).

Gonzalez, A.O., I. Ganguly, **M.C. McGraw**, and J. Larson: The role of surface dynamics in boreal spring submonthly eastern Pacific ITCZ shifts. American Geophyiscal Union Annual Meeting, 12/2020 (remote).

McGraw, M.C., C.M. Bitz, and E. Blanchard-Wrigglesworth: Evaluating very rapid sea ice loss events in dynamical model forecasts. Poster presentation: American Geophysical Union Annual Meeting, San Francisco, CA. 12/2019.

McGraw, M.C., and E.A. Barnes: A Causal Discovery Approach to Arctic-Midlatitude Dynamics. Oral pr,esentation: Atmospheric Dynamics seminar, Atmospheric Science, University of Washington, Seattle, WA. 11/2019.

McGraw, M.C., and E.A. Barnes: Using Causal Discovery to Explore Arctic-Midlatitude Dynamics. Oral presentation: American Geophysical Union Annual Meeting, Washington, DC. 12/2018.

McGraw, M.C., E.A. Barnes, S. Samarasinghe, and I. Ebert-Uphoff: A Causal Discovery Approach to Arctic-Midlatitude Dynamics. Oral presentation: NCAR Climate Variability and Change weekly seminar, Boulder, CO. 11/2018.

McGraw, M. C., and E. A. Barnes: Revisiting Causal Links Between the Arctic and Midlatitudes. Oral presentation: American Geophysical Union Annual Meeting, New Orleans, LA. 12/2017.

Samarasinghe, S., **M. C. McGraw**, E. A. Barnes, and I. Ebert-Uphoff: A Study of Causal Links Between the Arctic and the Midlatitude Jet-Streams. Spotlight presentation (with Savini Samarasinghe): 7th International Workshop on Climate Informatics, Boulder, CO. 09/2017.

McGraw, M. C., and E. A. Barnes: Revisiting Causal Links Between the Arctic and Midlatitudes. Poster: 21st Conference on Atmospheric and Oceanic Fluid Dynamics, Portland, OR. 06/2017.

McGraw, M. C., C. F. Baggett, C. Liu, B. D. Mundhenk, and E. A. Barnes: Multi-Scale Response of Moisture Flux to Projected Sea Ice Loss. Poster: 21st Conf. on Atmospheric and Oceanic Fluid Dynamics, Portland, OR. 06/2017.

McGraw, M. C., and E. A. Barnes: Comparing the Forced Response to Volcanic Eruptions Against Internal Variability in Climate Models. Poster: American Geophysical Union Annual Meeting, San Francisco, CA. 12/2016.

McGraw, M. C., and E. A. Barnes: Comparing the Forced Response to Volcanic Eruptions Against Internal Variability in Climate Models. Oral presentation: SPARC DynVAR Workshop, Helsinki, Finland. 06/2016.

McGraw, M. C., and E. A. Barnes: Comparing the Forced Response to Volcanic Eruptions Against Internal Variability in Climate Models. Oral presentation: NCAR Climate Variability and Change Working Group Meeting, Boulder, CO. 02/2016.

McGraw, M. C., and E. A. Barnes: Seasonal Sensitivity of the eddy-driven jet to tropospheric heating in an idealized AGCM. Poster: SPARC Storm Tracks Workshop, Grindelwald, Switzerland. 08/2015.

McGraw, M. C., and E. A. Barnes: Seasonal sensitivity of the eddy-driven jet to tropospheric heating in an idealized AGCM. Poster: 20th Conference on Atmospheric and Oceanic Fluid Dynamics, Minneapolis, MN. 06/2015.

WORKSHOPS ATTENDED

U. Washington Program on Climate Change Summer Institute, Seattle, WA (virtual), 09/2020.

CMIP6 Hackathon, Boulder, CO, 10/2019.

8th International Workshop on Climate Informatics, Boulder, CO, 09/2018.

CESM Polar Modeling Workshop, Boulder, CO, 08/2018.

7th International Workshop on Climate Informatics, Boulder, CO, 09/2017.

NCAR Community Earth System Model Tutorial, Boulder, CO, 08/2016.

SPARC DynVar Workshop, Helsinki, Finland, 06/2016.

SPARC Workshop on Storm Tracks, Grindelwald, Switzerland, 08/2015.

PROFESSIONAL ORGANIZATIONS AND OUTREACH

American Geophysical Union, member

American Meteorological Society, member

Reviewer for *Journal of Climate*, *Journal of Geophysical Research: Atmospheres*, *Geophysical Research Letters*, *Nature Climate Change*, *Earth System Dynamics*, *Weather and Climate Dynamics*; proposal reviewer for the National Science Foundation

U. Washington Atmospheric Sciences Diversity and Inclusion working group, member

U. Washington Atmospheric Sciences Colloquium Committee, member