

Patrick Martineau, Ph.D.

Researcher
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EMPLOYMENT

Researcher Application Laboratory Japan Agency for Marine-Earth Science and Technology Yokohama, Japan	2020-present
Project Research Associate / Visiting Scientist Research Center for Advanced Science and Technology The University of Tokyo, Tokyo, Japan Supervisor: Prof. Hisashi Nakamura	2019-2020
Japan Society for the Promotion of Science postdoctoral fellow Research Center for Advanced Science and Technology The University of Tokyo, Tokyo, Japan Supervisor: Prof. Hisashi Nakamura	2017-2019
Postdoctoral scholar Department of Atmospheric and Oceanic Sciences University of California, Los Angeles Supervisor: Prof. Gang Chen	2016-2017
Postdoctoral Research Associate Cornell University Supervisor: Prof. Gang Chen	2015-2016
Undergraduate Research Assistant Department of Atmospheric and Oceanic Sciences McGill University Advisor: Prof. Jacques Derome	Summer 2007

EDUCATION

Ph.D. in Atmospheric And Oceanic Sciences Department of Atmospheric and Oceanic Sciences McGill University Supervisor: Prof. Seok-Woo Son	2015
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M.Sc in Atmospheric And Oceanic Sciences *2011*
Department of Atmospheric and Oceanic Sciences
McGill University
Supervisor: Prof. Seok-Woo Son

B.Sc (Honours) in Atmospheric And Oceanic Sciences *2009*
Department of Atmospheric and Oceanic Sciences
McGill University

RESEARCH INTERESTS

- Socioeconomic impacts of climate variability
- Subseasonal atmospheric variability, weather extremes, and their modulation by various components of the Earth system (hydrosphere and cryosphere, etc...) under present and future climate conditions
- Analysis and prediction of the atmospheric circulation through machine learning
- Stratospheric variability and stratosphere-troposphere dynamical coupling
- Assessment and comparison of reanalysis datasets

TEACHING

Guest lecturer *2017*
McGill University
Course on data analysis in atmospheric and oceanic sciences (ATOC551). One class on the topic of Fourier transform and storm track identification.

Guest lecturer *2016*
Cornell University
Course on introductory atmospheric dynamics (EAS3420). Three classes taught.

PUBLICATIONS AND PRESENTATIONS

Peer-reviewed publications

Martineau, P., H. Nakamura, Y. Kosaka, and A. Yamamoto, 2020: Importance of a vertically tilting structure for energizing the North Atlantic Oscillation. *Sci. Rep.*, 10, 12671, <https://doi.org/10.1038/s41598-020-69551-5>.

Martineau, P., H. Nakamura, Y. Kosaka, B. Taguchi, and M. Mori, 2020: Modulations of North American and European Weather Variability and Extremes by Interdecadal Variability of the Atmospheric Circulation over the North Atlantic Sector. *J. Clim.*, 33, 8125–8146, <https://doi.org/10.1175/jcli-d-19-0977.1>.

Hwang, J., P. Martineau, S.-W. Son, T. Miyasaka, and H. Nakamura, 2020: The Role of Transient Eddies in North Pacific Blocking Formation and Its Seasonality. *J. Atmos. Sci.*, 77, 2453–2470, <https://doi.org/10.1175/JAS-D-20-0011.1>.

Son, S., H. Kim, K. Song, S. Kim, P. Martineau, Y. Hyun, and Y. Kim, 2020: Extratropical Prediction Skill of the Subseasonal - to - Seasonal (S2S) Prediction Models. *J. Geophys. Res. Atmos.*, 125, submitted, doi:10.1029/2019JD031273

Fujiwara, M., P. Martineau, and J. S. Wright, 2020: Surface temperature response to the major volcanic eruptions in multiple reanalysis data sets. *Atmos. Chem. Phys.*, 20, 345–374, doi:10.5194/acp-20-345-2020

Gerber, E. P., and P. Martineau, 2018: Quantifying the variability of the annular modes: Reanalysis uncertainty vs. sampling uncertainty. *Atmospheric Chemistry and Physics Discussions*, 1–28. <https://doi.org/10.5194/acp-2018-585>

Martineau, P., J. S., Wright, Zhu N., and M. Fujiwara, 2018: Zonal-mean data set of global atmospheric reanalyses on pressure levels, *Earth Syst. Sci. Data*, 10(4), 1925–1941, doi:10.5194/essd-10-1925-2018

Martineau, P., S.-W. Son, M. Taguchi, and A. H. Butler, 2018: A comparison of the momentum budget in reanalysis datasets during sudden stratospheric warming events, *Atmos. Chem. Phys. Discuss.*, 18(10), 7169–7187, doi:10.5194/acp-18-7169-2018

Martineau, P., G. Chen, S.-W. Son, and J. Kim., 2018: Lower-stratospheric control of the frequency of sudden stratospheric warming events, *J. Geophys. Res. Atmos.*, 123(6), 3051–3070, doi:10.1002/2017JD027648

Martineau P., G. Chen, and D. A. Burrows, 2017: Wave Events: Climatology, Trends, and Relationship to Northern Hemisphere Winter Blocking and Weather Extremes. *J. Clim.*, 30, 5675–5697, doi:10.1175/JCLI-D-16-0692.1.

Fujiwara, M., and Coauthors, 2017: Introduction to the SPARC Reanalysis Intercomparison Project (S-RIP) and overview of the reanalysis systems. *Atmos. Chem. Phys.*, 17, 1417–1452, doi:10.5194/acp-17-1417-2017.

Martineau, P., S.-W. Son, and M. Taguchi, 2016: Dynamical Consistency of Reanalysis Datasets in the Extratropical Stratosphere. *J. Clim.*, 29, 3057–3074, doi:10.1175/JCLI-D-15-0469.1.

Martineau, P., and S.-W. Son, 2015: Onset of Circulation Anomalies during Stratospheric Vortex Weakening Events: The Role of Planetary-Scale Waves. *J. Clim.*, 28, 7347–7370, doi:10.1175/JCLI-D-14-00478.1.

Martineau, P., and S.-W. Son, 2013: Planetary-scale wave activity as a source of varying tropospheric response to stratospheric sudden warming events: A case study. *J. Geophys. Res. Atm.*, 118, doi:10.1002/jgrd.50871.

Martineau, P., and S.-W. Son, 2010: Quality of reanalysis data during stratospheric vortex weakening and intensification events. Geophys. Res. Lett., 37, doi:10.1029/2010GL045237.

Presentations (as the first author only)

Invited:

Martineau, P., H. Nakamura, Y. Kosaka, and A. Yamamoto, 2019 Importance of a vertically tilting structure for energizing the North Atlantic Oscillation, RCAST special symposium on climate science with Prof. Hoskins, November 8, Research Center for Advanced Science and Technology, Tokyo

Martineau P., Nakamura H., Taguchi B., Kosaka Y. and Mori M., 2018: Role of coupled atmosphere-ocean variability over the Atlantic basin in modulating North-American and European weather extremes on multidecadal timescales, invited seminar, December 5, Pennsylvania State University

Martineau P., Nakamura H., Taguchi B., Kosaka Y. and Mori M., 2018: Role of coupled atmosphere-ocean variability over the Atlantic basin in modulating North-American and European weather extremes on multidecadal timescales, invited seminar, November 20, Kongju National University, Korea

Martineau P., 2018: Role of the Atlantic Ocean in modulating North-American and European weather extremes on decadal timescales, invited seminar, May 11, York University, Canada

Martineau, P., G. Chen, S.-W. Son and J. Kim, 2017: Lower stratospheric control of the frequency of sudden stratospheric warming events, invited oral, JpGU-AGU joint meeting 2017, May 20-25, Makuhari, Japan

Martineau, P., G. Chen, and A. Burrows, 2016: Méandres du courant-jet: extrêmes de température et changements climatiques, invited seminar, November 1, UQAM, Montreal, Canada

Contributed:

Martineau P., Nakamura H., Kosaka Y. and Yamamoto A., 2020: Importance of a vertically tilting structure for energizing the North Atlantic Oscillation, April, ISAR-6 / Sixth International Symposium on Arctic Research, Tokyo, Japan

Martineau P., Nakamura H., Kosaka Y. and Yamamoto A., 2019: Importance of a vertically tilting structure for energizing the North Atlantic Oscillation, oral, December, AGU Fall Meeting, San Francisco, USA

Martineau P., Nakamura H., Taguchi B., Kosaka Y. and Mori M., 2019: Modulation of North-American and European Weather Extremes by Interdecadal Variability of the Atmospheric Circulation over the North Atlantic Sector, oral, July 12, 27th IUGG General Assembly, Montreal, Canada

- Martineau P., Nakamura H., Kosaka Y. and Yamamoto A., 2019: Maintenance of the North Atlantic Oscillation by baroclinic energy conversion, oral, July 9, 27th IUGG General Assembly, Montreal, Canada
- Martineau P., Nakamura H., Kosaka Y. and Yamamoto A., 2019: Maintenance of the North Atlantic Oscillation by baroclinic energy conversion, oral, February 12, NORPAN Closing Workshop, Hakone, Japan
- Martineau P., Nakamura H., Taguchi B., Kosaka Y. and Mori M., 2018: Role of coupled atmosphere-ocean variability over the Atlantic basin in modulating North-American and European weather extremes on multidecadal timescales, oral, December 14, AGU Fall Meeting, Washington D.C.
- Martineau P., Nakamura H., Taguchi B., Kosaka Y. and Mori M., 2018: Role of coupled atmosphere-ocean variability over the Atlantic basin in modulating North-American and European weather extremes on multidecadal timescales, poster, October 4, SPARC general assembly, Kyoto, Japan
- Martineau P., Chen G., Son S.-W. and Kim J., 2018: Lower-stratospheric control of the frequency of sudden stratospheric warming events, poster, October 4, SPARC general assembly, Kyoto, Japan
- Martineau P., Nakamura H., Taguchi B., Kosaka Y. and Mori M., 2018: Decadal covariability between ocean temperatures and weather extremes, oral, European Geosciences Union General Assembly 2018, 8–13 April 2018, Vienna, Austria
- Martineau P., Chen G., Son S.-W. and Kim J., 2018: Lower-stratospheric control of the frequency of sudden stratospheric warming events, poster, European Geosciences Union General Assembly 2018, 8–13 April 2018, Vienna, Austria
- Martineau P., H. Nakamura, B. Taguchi, Y. Kosaka, and M. Mori, 2018: Decadal covariability between ocean temperatures and weather extremes, poster, Ocean Science meeting 2018, February 11-16, Portland, Oregon
- Martineau P., Chen G., Son S.-W. and Kim J., 2017: Lower-stratospheric control of the frequency of sudden stratospheric warming events, poster, AGU 2017 Fall Meeting, December 11-15, New-Orleans, Louisiana
- Martineau P., G. Chen, 2017: The role of wave trains in the intensification of mid-latitude wintertime waviness, poster, Asian conference on meteorology, October 23-24, Busan, Korea
- Martineau P., G. Chen, S.-W. Son, and J. Kim, 2017: Lower-stratospheric control of the frequency of sudden stratospheric warming events, oral, WCRP/SPARC Local Workshop, October 19-20, Incheon, Korea
- Martineau P., S.-W. Son and M. Taguchi, 2017: A comparison of the momentum budget in reanalysis datasets during sudden stratospheric warming events, poster, JpGU-AGU joint meeting 2017, May 20-25, Makuhari, Japan

Martineau, P., G. Chen, and A. Burrows, 2016: Wave events: climatology and relationship to Northern Hemisphere winter blocking and weather extremes, poster, AGU 2016 Fall Meeting, December 12-16, San Francisco, California

Martineau, P., G. Chen, A. Burrows, D. Xue, and J. Lu, 2016: Finite-amplitude local wave activity as a diagnostic of persistent extreme weather, poster, DynVar Workshop, June 6-10, Helsinki, Finland

Martineau, P., S.-W. Son and M. Taguchi, 2016: Dynamical consistency of reanalysis datasets in the extratropical stratosphere, oral, DynVar Workshop, June 6-10, Helsinki, Finland

Martineau, P., G. Chen, and A. Burrows, 2016: Finite-amplitude local wave activity as a diagnostic of blocking events and persistent extreme weather, oral, Workshop on Atmospheric Blocking, April 6-8, Reading, England

Martineau, P., S.-W. Son and M. Taguchi, 2015: Dynamical consistency of reanalysis data sets in the extratropical stratosphere, poster, S-RIP Workshop, October 12-13, Paris, France

Martineau, P., E. Gerber and coauthors, 2015: Chapter 6: Stratosphere-Troposphere Coupling, oral, S-RIP Workshop, October 12-13, Paris, France

Martineau, P., S.-W. Son and M. Taguchi, 2015: How well do momentum diagnostics explain extratropical stratospheric variability in reanalysis datasets? oral, 18th Conference on Middle Atmosphere, AMS 2015, January 4-8, Phoenix, Arizona, USA

Martineau, P. and S.-W. Son, 2015: Onset of circulation anomalies during stratospheric vortex weakening events: the role of planetary-scale waves. poster, AMS 2015 Phoenix, Arizona, January 4-8, USA

Martineau, P. and S.-W. Son, 2014: Which reanalysis data is good for momentum diagnostics of the extratropical stratosphere? poster, SPARC Reanalysis Intercomparison Project (S-RIP) workshop, September 10-12, Maryland, USA

Martineau, P. and S.-W. Son, 2013: The role of momentum forcing by planetary-scale waves in the onset of tropospheric circulation anomalies during stratospheric sudden warming events, oral, 17th Conference on Middle Atmosphere, June 16-21, Newport, Rhode Island

Martineau, P. and S.-W. Son, 2013: A spectral climatology of planetary-scale disturbances in the southern and northern hemispheres: present and future climate scenarios, poster, 17th Conference on Middle Atmosphere, June 16-21, Newport, Rhode Island

Martineau, P. and S.-W. Son, 2013: The role of momentum forcing by planetary-scale waves in the onset of tropospheric circulation anomalies during stratospheric sudden warming events, poster, WCRP Regional Workshop on Stratosphere-Troposphere Processes and their Role in Climate, April 1-3, Kyoto, Japan

Martineau, P. and S.-W. Son, 2012: Tropospheric response to stratospheric vortex weakening events and its inter-annual variability in the Northern Hemisphere cold season, oral, AGU 2012 fall meeting, December 3-7, San Francisco, California

Martineau, P. and S.-W. Son, 2012: Downward propagation of Stratospheric Vortex Weakening events, oral, International Polar Year, From Knowledge to Action, April 23-27, Montreal, Canada

Martineau, P. and S.-W. Son, 2012: Contrasting propagating and non-propagating Stratospheric Sudden Warming events, poster, Workshop on Stratospheric Sudden Warming and its Role in Weather and Climate Variations, February 22-24, Kyoto, Japan

Martineau, P. and S.-W. Son, 2011: Quality of reanalysis data during stratospheric vortex weakening and intensification events, poster, Stratospheric Climate and Coupling Between the Stratosphere and Troposphere, 91st American Meteorological Society Annual Meeting, January 23-27, Seattle, WA

Martineau, P. and S.-W. Son, 2010: Quality of Reanalysis Data during Stratospheric Extreme Events, poster, Stratospheric Processes and their Role in Climate, 3rd Joint CMOS-CGU Congress, May 31-June 4, Ottawa, Canada

PROFESSIONAL ACTIVITIES

Convener of a session entitled “Atmospheric Circulation and Hydrological Cycle under a changing climate: Monsoons, Storm Tracks, and the ITCZ” (A106; AGU 2016)

Co-lead of the chapter “Stratosphere–Troposphere Coupling” of the S-RIP project (<http://s-rip.ees.hokudai.ac.jp/report/structure.html>)

OUTREACH

Guest lectures at the Toyama Senior Prefectural High School and Soka High School as part of the JSPS Science Dialogue program <https://www.jsps.go.jp/english/e-plaza/e-sdialogue/index.html>.

PEER REVIEW EXPERIENCE

Journal of Climate

Climate Dynamics

Quarterly Journal of the Royal Meteorological Society

Monthly Weather Review

Current Climate Change Reports

Journal of Geophysical Research: Atmospheres

Annales Geophysicae (Copernicus)

SCHOLARSHIPS

Japan Society for the Promotion of Science Postdoctoral Fellowship for Overseas Researchers	<i>Aug 2017 – Aug 2019</i>
Alexander Graham Bell Canada Graduate Scholarships NSERC CGS D	<i>Sept 2011 – Sept 2014</i>
Master's research scholarship FQRNT	<i>Sept 2010 – Sept 2011</i>
Alexander Graham Bell Canada Graduate Scholarship NSERC CGS M	<i>Sept 2009 – Sept 2010</i>
Undergraduate Summer Research Award NSERC USRA	<i>May 2008 – Sept 2008</i>

AWARDS

Early Career Scientist Best Poster Award, SPARC General Assembly	<i>2018</i>
GEC3 Travel Grant	<i>2012</i>
Atmospheric and Meteorological Graduate Supplements Environment Canada (Supplements CGS D)	<i>2011 - 2012</i>
Peter-Zwack prize (CMOS)	<i>2011</i>
McGill's Dr. and Mrs. Milton Leong Graduate Student Award	<i>2009</i>
Sigma Xi: McGill Chapter Undergraduate Research Award	<i>2009</i>
First Class Honours in Atmospheric Science, J.S. Marshall Prize	<i>2009</i>

SKILLS

Language: French and English, elementary Japanese
 Operating System: Linux and Windows
 Programming: Python, Matlab, Bash, Fortran
 Presentation: Latex, PowerPoint, Word, OpenOffice, Illustrator

MEMBERSHIPS

American Geophysical Union
 American Meteorological Society