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CONTACT INFORMATION	E-mail: mccraycd@gmail.com Website: www.cdmccray.com	Languages: English (native), French (fluent)
EDUCATION	<p><b>Ph.D., Atmospheric and Oceanic Sciences</b> <span style="float: right;"><b>2020</b></span>  <b>McGill University</b>, Montréal, Québec, Canada</p> <ul style="list-style-type: none"> <li>• Dissertation: <i>Synoptic-dynamic and thermodynamic mechanisms supporting long-duration freezing rain events over North America</i></li> <li>• Supervisor: Prof. John R. Gyakum</li> </ul> <p><b>B.S., Atmospheric Sciences and Mathematics</b> <span style="float: right;"><b>2015</b></span>  <b>Lyndon State College</b>, Lyndonville, Vermont, U.S.A.</p> <ul style="list-style-type: none"> <li>• Graduated magna cum laude</li> </ul>	
RESEARCH EXPERIENCES	<p><b>Postdoctoral Fellow</b> <span style="float: right;"><b>2020–</b></span>  <b>Université du Québec à Montréal (UQAM)</b>  Department of Earth and Atmospheric Sciences  <b>Ouranos</b> Consortium on Regional Climatology and Adaptation to Climate Change</p> <ul style="list-style-type: none"> <li>• Studying the evolution of ice storms over North America under climate change using an ensemble of regional climate model (RCM) simulations</li> <li>• Examining the uncertainty related to precipitation type algorithm selection on projected changes in freezing rain events</li> </ul> <p><b>Graduate Research Assistant</b> <span style="float: right;"><b>2015–2020</b></span>  McGill University, Department of Atmospheric &amp; Oceanic Sciences</p> <ul style="list-style-type: none"> <li>• Researched thermodynamic and synoptic-dynamic conditions associated with long-duration freezing rain events over the United States and Canada</li> </ul> <p><b>Research Assistant – NCEP Internship Program</b> <span style="float: right;"><b>2017</b></span>  NOAA/NWS Weather Prediction Center – College Park, Maryland</p> <ul style="list-style-type: none"> <li>• Mentors: Bruce Veenhuis, James Nelson</li> <li>• Project: Verification of WPC ice accretion guidance using observed ice accretion from surface stations <ul style="list-style-type: none"> <li>– Developed procedure using Python and Model Evaluation Tools (MET) to evaluate ice accretion forecasts over the United States</li> </ul> </li> </ul> <p><b>Meteorology Research Intern</b> <span style="float: right;"><b>2015</b></span>  IBM T.J. Watson Research Center – Yorktown Heights, New York</p> <ul style="list-style-type: none"> <li>• Project: Verification of IBM’s Deep Thunder weather forecast model <ul style="list-style-type: none"> <li>– Used Python to download data from other forecast sources and compare skill with IBM’s forecasts</li> </ul> </li> </ul> <p><b>Research Assistant – NOAA Hollings Scholar</b> <span style="float: right;"><b>2014</b></span>  NOAA/NWS Storm Prediction Center – Norman, Oklahoma</p> <ul style="list-style-type: none"> <li>• Mentors: Dr. Christopher Melick, William Bunting</li> <li>• Project: Verification of SPC winter weather mesoscale discussions <ul style="list-style-type: none"> <li>– Devised method for verifying SPC winter weather forecast products with GEMPAK and Perl</li> </ul> </li> </ul>	

- Developed gridded dominant precipitation type product for operations

TEACHING EXPERIENCES	<p><b>Course Lecturer</b> <span style="float: right;"><b>2019</b></span>          McGill University, Atmospheric &amp; Oceanic Sciences</p> <ul style="list-style-type: none"> <li>• Fall 2019: ATOC 540 - Synoptic Meteorology I (graduate)</li> </ul> <p><b>Teaching Assistant</b> <span style="float: right;"><b>2016 – 2019</b></span>          McGill University, Atmospheric &amp; Oceanic Sciences</p> <ul style="list-style-type: none"> <li>• Winter 2019: ATOC 542 - Weather Analysis and Forecasting (graduate)</li> <li>• Winter 2017, 2018, 2019: ATOC 541 - Synoptic Meteorology II (graduate)</li> <li>• Fall 2017, 2018: ATOC 540 - Synoptic Meteorology I (graduate)</li> <li>• Fall 2016: ATOC 185 - Natural Disasters (undergraduate)</li> <li>• Winter 2016: ATOC 184 - Science of Storms (undergraduate)</li> </ul> <p><b>Supplementary Instructor</b> <span style="float: right;"><b>2014 – 2015</b></span>          Lyndon State College Academic Support</p> <ul style="list-style-type: none"> <li>• Atmospheric Dynamics I and II</li> </ul>
REFEREED JOURNAL PUBLICATIONS	<p>[1] <b>McCray, C.D.</b>, E.H. Atallah, and J.R. Gyakum, 2019: Long-Duration Freezing Rain Events over North America: Regional Climatology and Thermodynamic Evolution. <i>Weather and Forecasting</i>, <b>34</b>, 665-681, <a href="https://doi.org/10.1175/WAF-D-18-0154.1">https://doi.org/10.1175/WAF-D-18-0154.1</a></p> <p>[2] <b>McCray, C.D.</b>, J.R. Gyakum and E.H. Atallah, 2020: Regional Thermodynamic Characteristics Distinguishing Long- and Short-Duration Freezing Rain Events over North America. <i>Weather and Forecasting</i>, <b>35</b>, 657-671, <a href="https://doi.org/10.1175/WAF-D-18-0154.1">https://doi.org/10.1175/WAF-D-18-0154.1</a></p> <p>[3] <b>McCray, C.D.</b>, J.R. Gyakum and E.H. Atallah: Synoptic-Dynamic and Airmass Characteristics Distinguishing Long- and Short-Duration Freezing Rain Events in the South-Central United States. Accepted to <i>Monthly Weather Review</i>, 10.1175/MWR-D-20-0306.1</p>
PROFESSIONAL DEVELOPMENT	<p><b>Science Outside the Lab North</b> <span style="float: right;"><b>2019</b></span>          Ottawa, Ontario and Montreal, Quebec</p> <ul style="list-style-type: none"> <li>• Attended week-long workshop for graduate students and postdocs fostering discussions with scientists working in policy in the Canadian federal government.</li> <li>• Learned how science informs policy in Canada and met with policy analysts, senior civil servants, think tanks, and scientists doing policy-relevant work.</li> </ul> <p><b>Tomlinson Graduate Teaching Workshop</b> <span style="float: right;"><b>2018</b></span>          McGill University - Montreal, Quebec</p> <ul style="list-style-type: none"> <li>• Participated in one-day teaching workshop for science graduate students.</li> <li>• Learned techniques for presenting information effectively, grading assignments, and communicating with students.</li> </ul> <p><b>NCAR Advanced Study Program Summer Colloquium</b> <span style="float: right;"><b>2017</b></span>          NCAR Mesa Laboratory - Boulder, Colorado</p> <ul style="list-style-type: none"> <li>• Topic: The Interaction of Precipitation with Orography</li> <li>• Participated in two weeks of seminars on topics related to orographic precipitation in weather and climate.</li> <li>• Ran WRF-ARW model and analyzed output using Python.</li> </ul>

- OTHER RELEVANT EXPERIENCE**
- Meteorologist Intern** **2015–2017**  
 WeatherWorks, LLC, Hackettstown, New Jersey
- Wrote winter storm summaries for snow and ice events and created snowfall total reports for clients
- Winter Road Weather Forecaster** **2013 – 2015**  
 Vermont Institute of Applied Meteorology, Lyndonville, Vermont
- Forecasted regional road weather conditions within the state of Vermont for the Vermont Agency of Transportation (VTrans)
- NWS Summer Student Intern** **2013**  
 U.S. National Weather Service, Taunton, Massachusetts
- Aided in public outreach and media/partner relationship development
  - Shadowed forecasters and gained experience with AWIPS
- LEADERSHIP AND SERVICE**
- AMS Committee on Weather Analysis & Forecasting** **2015 – 2020**
- Student member
  - Conference Program Committee Chairperson
    - 29<sup>th</sup> Weather Analysis and Forecasting/25<sup>th</sup> Numerical Weather Prediction Conferences, Denver, CO, 4–8 June 2018
  - Conference Program Committee member
    - 30<sup>th</sup> Weather Analysis and Forecasting/25<sup>th</sup> Numerical Weather Prediction Conferences, Boston, MA, 22–26 January 2020
    - 28<sup>th</sup> Weather Analysis and Forecasting/24<sup>th</sup> Numerical Weather Prediction Conferences, Seattle, WA, 22–26 January 2017
    - 27<sup>th</sup> Weather Analysis and Forecasting/23<sup>rd</sup> Numerical Weather Prediction Conferences, Chicago, IL, 28 June–3 July 2015
- Reviewer - AMS Journals** **2019 - Present**
- *Weather and Forecasting*
  - *Journal of Applied Meteorology and Climatology*
- McGill Council of Atmospheric & Oceanic Sciences** **2015 – 2019**
- 2016 – 2019: Graduate Student Representative to the department
    - Attended monthly departmental faculty meetings and represented concerns of graduate student body
  - 2015 – 2016: First-Year Student Representative
- Pint of Science Canada – Montreal** **2019**
- Event manager for *Planet Earth* sessions of the Montreal English-language version of *Pint of Science*, an international science communication event that brings scientists together with the public to discuss their research
- President, Lyndon State College AMS & NWA** **2013 – 2015**
- Chairperson and lead organizer
    - 40<sup>th</sup> Northeastern Storm Conference, Saratoga Springs, NY, 6–8 March 2015
    - 39<sup>th</sup> Northeastern Storm Conference, Rutland, VT, 7–9 March 2014

AWARDS AND SCHOLARSHIPS	<ul style="list-style-type: none"> <li>• Outstanding Oral Presentation Award AMS 30<sup>th</sup> Conference on Weather Analysis &amp; Forecasting <b>2020</b></li> <li>• FRQNT – Doctoral research scholarship (\$49,000) <b>2019</b></li> <li>• CatIQ Connect Student Delegate Award <b>2019</b></li> <li>• Outstanding Student Oral Presentation AMS 29<sup>th</sup> Conference on Weather Analysis &amp; Forecasting <b>2018</b></li> <li>• 2<sup>nd</sup> Place Student Oral Presentation AMS 28<sup>th</sup> Conference on Weather Analysis &amp; Forecasting <b>2017</b></li> <li>• 1<sup>st</sup> Place Student Oral Presentation AMS 5<sup>th</sup> Conference on the Transition of Research to Operations <b>2015</b></li> <li>• NOAA Ernest F. Hollings Scholarship <b>2013 – 2015</b></li> <li>• AMS Undergraduate Named Scholarship <b>2014</b></li> </ul>
INVITED PRESENTATIONS	<ul style="list-style-type: none"> <li>• 2020 WPC-HMT Winter Weather Experiment <b>2020</b> – <i>Long-Duration Freezing Rain Events over North America: Regional Climatology and Maintenance Mechanisms</i></li> <li>• City of Montréal – Mayor’s executive committee <b>2019</b> – <i>Effets observés des changements climatiques sur l’hiver Montréalais (Observed effects of climate change on Montreal winters)</i> – Presentation to members of mayor’s executive committee responsible for environment and the ecological transition/resilience.</li> <li>• Centre de recherche informatique de Montréal (CRIM) <b>2018</b> – <i>Analyzing weather data to improve prediction of freezing rain events</i></li> <li>• Ouranos (regional climate research consortium) – Montreal <b>2017</b> – <i>Ice storms over North America: A thermodynamic and synoptic-dynamic analysis</i></li> <li>• Lyndon State College, Atmospheric Sciences Department <b>2016</b> – <i>A Surface Dynamic and Thermodynamic Analysis of Long-Duration Freezing Rain Events</i></li> </ul>
CONFERENCE ORAL PRESENTATIONS	<p><b>McCray, C.D.,</b> J.M. Thériault, D. Paquin and E. Bresson. Quantifying the Impact of Precipitation Type Algorithm Selection on Projected Changes to Freezing Rain Events in an Ensemble of RCM Simulations. <i>34<sup>th</sup> Conference on Climate Variability and Change</i>, 101<sup>st</sup> AMS Annual Meeting, Online, 10–15 January 2021.</p> <p><b>McCray, C.D.,</b> J.R. Gyakum, and E.H. Atallah. What Allows Some Freezing Rain Events to Persist for Many Hours? A Focus on Dynamic and Thermodynamic Processes. <i>30<sup>th</sup> Conference on Weather Analysis and Forecasting</i>, 100<sup>th</sup> AMS Annual Meeting, Boston, MA, 12–16 January 2020.</p> <p><b>McCray, C.D.,</b> J.R. Gyakum, and E.H. Atallah. Synoptic-Dynamic Modulations of Freezing Rain Event Duration. <i>19<sup>th</sup> Cyclone Workshop</i>, Seon, Germany, 29 September–4 October 2019.</p> <p><b>McCray, C.D.,</b> J.R. Gyakum, and E.H. Atallah. Thermodynamic and Synoptic-Dynamic Modulations of Freezing Rain Event Duration. <i>27<sup>th</sup> IUGG General Assembly</i>, Montreal, QC, 8–18 July 2019.</p>

- McCray, C.D.**, J.R. Gyakum, and E.H. Atallah. Thermodynamic and Synoptic-Dynamic Modulations of Freezing Rain Event Duration. *44<sup>th</sup> Northeastern Storm Conference*, Saratoga Springs, NY, 8–10 March 2019.
- McCray, C.D.**, J.R. Gyakum, and E.H. Atallah. Long-Duration Freezing Rain Events over North America. *CatIQ Connect – Canada’s Catastrophe Conference*, Toronto, ON, 4–6 February 2019.
- McCray, C.D.**, J.R. Gyakum, and E.H. Atallah. Long-Duration Freezing Rain Events over North America: Regional Climatology and Maintenance Mechanisms. *29<sup>th</sup> Conference on Weather Analysis & Forecasting*, Denver, CO, 4–8 June 2018.
- McCray, C.D.**, J.R. Gyakum, and E.H. Atallah. A Multi-Scale Analysis of Widespread Long-Duration Freezing Rain Events over North America. *18<sup>th</sup> Cyclone Workshop*, Sainte-Adele, QC, 1–6 October 2017.
- McCray, C.D.**, B. Veenhuis, and J. Nelson. Verification of WPC freezing rain guidance using ASOS ice accretion observations. *NCEP Student Presentation Workshop*, College Park, MD, 10 August 2017.
- McCray, C.D.**, J.R. Gyakum, and E.H. Atallah. A Surface Dynamic and Thermodynamic Analysis of Long-Duration Freezing Rain Events. *Canadian Network for Regional Climate and Weather Processes Annual Science Meeting*, Montreal, QC, 3–5 May 2017.
- McCray, C.D.**, J.R. Gyakum, and E.H. Atallah. A Surface Dynamic and Thermodynamic Analysis of Long-Duration Freezing Rain Events. *28<sup>th</sup> Conference on Weather Analysis and Forecasting*, 97<sup>th</sup> AMS Annual Meeting, Seattle, WA, 22–26 January 2017.
- McCray, C.D.**. Influences of the Lake Champlain Valley on Freezing Rain Events at Burlington, Vermont. *41<sup>st</sup> Northeastern Storm Conference*, Saratoga Springs, NY, 4–6 March 2016.
- McCray, C.D.**, C. J. Melick, W. F. Bunting, I. L. Jirak, A. E. Cohen, A. R. Dean, P. T. Marsh, and J. L. Guyer. Verification of Storm Prediction Center Winter Weather Mesoscale Discussions. *5<sup>th</sup> Conference on the Transition of Research to Operations*, 95<sup>th</sup> AMS Annual Meeting, Phoenix, AZ, 4–8 January 2015.
- McCray, C.D.**, C. J. Melick, W. F. Bunting, I. L. Jirak, A. E. Cohen, A. R. Dean, P. T. Marsh, and J. L. Guyer. Verification of Storm Prediction Center Winter Weather Mesoscale Discussions. *15<sup>th</sup> Northeast Regional Operational Workshop (NROW XV)*, Albany, NY, 12–13 November 2014.
- CONFERENCE POSTERS
- Wray, J., J. Gyakum, **C. McCray** and Y. Low. The Saint Lawrence River Valley and Lake Champlain Valley Front. *101<sup>st</sup> AMS Annual Meeting*, Online, 10–15 January 2021.
- Lachapelle, M., J. Poingt, **C. McCray**, and J.M. Thériault. Climatology of ice pellets formed through complete melting of solid precipitation over southern Quebec. *2020 American Geophysical Union Fall Meeting*, Online, 1–17 December 2019.

**McCray, C.D.,** J.R. Gyakum, and E.H. Atallah. Long-Duration Freezing Rain Events over North America. *CatIQ Connect – Canada’s Catastrophe Conference.*, Toronto, ON, 4–6 February 2019.

**McCray, C.D.,** J.R. Gyakum, and E.H. Atallah. Long-Duration Freezing Rain Events over North America: Regional Climatology and Maintenance Mechanisms. *8<sup>th</sup> GEWEX Open Science Conference*, Canmore, AB, 6–11 May 2018.

**McCray, C.D.,** J.R. Gyakum, and E.H. Atallah. A Synoptic- and Planetary-Scale Analysis of Widespread North American Ice Storms. *2017 American Geophysical Union Fall Meeting*, New Orleans, LA, 11–16 December 2017.

**McCray, C.D.,** J.R. Gyakum, and E.H. Atallah. Characteristics of High-Impact Long-Duration Freezing Rain Events over North America. *2017 European Geosciences Union General Assembly*, Vienna, Austria, 23–28 April 2017.

TECHNICAL  
SKILLS

Programming Languages/Systems:

- Python (NumPy, Pandas, xarray, Matplotlib), Perl, MATLAB, Unix

Meteorological Packages:

- GEMPAK, Model Evaluation Tools (MET), AWIPS, GRLevelX, BUFKIT

MEDIA  
INTERVIEWS

"De la neige à la chaleur accablante en quelques jours", *Le Journal de Montréal*, 4 June 2020.

"Une première tempête réellement hâtive?", *Le Devoir*, 15 November 2019.

"Changements climatiques, la cause de notre hiver difficile ?", *MétéoMédia*, 29 March 2019.

"Montreal's winters unlikely to remain white", *McGill Tribune*, 26 March 2019.

"Weather whiplash: Yes, Montreal winters are getting wetter and icier", *Montreal Gazette*, 23 February 2019.

"As city scrambles on icy roads, scientist warns of new normal for Montreal winters", *CTV News Montreal*, 25 February 2019.

"Incoming: snow, freezing rain, and then rain are heading for southern Quebec", *CBC Montreal News*, 23 February 2019.

"Another ice storm could happen. Is Hydro-Quebec ready?", *CBC Montreal News*, 5 January 2018.