Maxwell Grover

Mgroverwx@gmail.com· blog.mgrover.dev

Education

Master of Science: Atmospheric Science August 2019 - May 2021
University of Illinois Urbana-Champaign – Champaign, Illinois

- Funded through the RELAMPAGO Field Campaign
- Improving global observations of thunderstorm updraft width through satellite remote sensing

Bachelor of Science: Meteorology Major, Mathematics Minor August 2015 – May 2019
Valparaiso University – Valparaiso, Indiana

- Magna Cum Laude
- Presidential Scholarship based on merit

Technical Skills

- Programming languages and mathematical packages: Python, R, FORTRAN, Maple
- GIS and image processing programs: ArcGIS Pro, ArcMAP, ENVI
- Tools and environments: GEMPAK, Github, Linux, Mac OS, Windows

Research and Internship Experience

Software Developer February 2022 – Present
Environmental Science Division, Argonne National Laboratory, Lemont, Illinois

- Develop open-source software packages and platforms related to working with observational weather data
- Coordinate with the open weather radar data community to develop educational materials
- Lead software educational workshops for the atmospheric science community

Software Engineer I March 2021 – February 2022
Climate and Global Dynamics Lab, National Center for Atmospheric Research, Boulder, Colorado

- Design and implement key components of climate diagnostics workflows
- Design and develop educational materials and software documentation related to Python based climate analysis tools
- Coordinate biweekly presentations and weekly blog posts related to Earth System Data Science

Graduate Research Assistant August 2019 – May 2021
Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign, Urbana, IL

- Research the relationship between overshooting tops and updraft characteristics from observational data
- Develop a data workflow for studying pseudo global warming impacts on severe weather hazards
- Produce results that include abundant documentation such that workflows can be easily reproduced

Software Development Intern May 2019 – August 2019
Unidata, University Corporation for Atmospheric Research, Boulder, Colorado

- Actively developed MetPy, a Python library for meteorological applications
- Created a METAR parser and applied it to various text files to read in surface observation data
- Developed a simplified visualization method, easing the Python visualization learning curve

Independent Student Researcher May 2018 – July 2019
Department of Geography and Meteorology, Valparaiso University, Valparaiso, Indiana
- Collaborated with both the computer science and meteorology department in addition to NCAR
- Assembled parallel computing devices and compiled necessary libraries to run the WRF
- Benchmarked multiple systems and platforms to evaluate computational effectiveness

Student Contractor August 2018 – December 2018
USGS Lake Michigan Ecological Research Station, Chesterton, Indiana
- Developed tools to ingest, process, and analyze microclimate data using Python and ArcGIS
- Determined location and characteristics of microclimates at the Indiana Dunes National Lakeshore
- Documented project progress and submit for publication

Research Experience for Undergraduates (REU) Participant May 2018 – July 2019
Department of Geography, University of Northern Iowa, Cedar Falls, Iowa
- Interdisciplinary Research Experience in Hyperspectral Imaging (IDREHSI) Program
- Collaborated with faculty mentor and program director to complete original research
- Applied remote sensing techniques on hyperspectral images to detect tornado damage swaths

Teaching and Mentoring Experience

Lead Organizer and Instructor, Open Radar Short Course August 2023
AMS Short Course, American Meteorological Society Radar Meeting, Minneapolis, Minnesota
- Configured the execution and testing of the environment
- Instructed over 40 students in a hybrid setting
- Coordinated contributions from 9 international organizations, including a developers workshop

Short Course Co-Lead, ARM Open Science in the Rockies Short Course January 2023
AMS Short Course, American Meteorological Society Annual Meeting, Denver, Colorado
- Organized agenda and assembled materials used for course
- Configured the platform used for the short course
- Instructed over 25 students for the first ARM-DOE sponsored AMS short course

Instructor, AMS Student Conference Python Workshop January 2020
Student Conference, American Meteorological Society Annual Meeting, Boston, Massachusetts
- Reviewed and edited educational materials for the workshop
- Instructed over 150 students about how to use Python for meteorology within their various workflows

Instructor, Unidata Python Regional Workshop at SUNY Albany May 2019
Unidata, University Corporation for Atmospheric Research (UCAR), Boulder, Colorado
- Reviewed and edited educational materials for the workshop
- Instructed professors, students, and members of the private sector about how to use Python for meteorology

Tutor, Valparaiso University Weather Center January 2018 – May 2019
Department of Geography and Meteorology, Valparaiso University, Valparaiso, Indiana
- Served as a resource for meteorology students by answering questions relating to various coursework
- Led supplemental instruction sessions for students struggling with assignments or projects

Teaching Assistant, Climatology Lab January 2018 – May 2019
Department of Geography and Meteorology, Valparaiso University, Valparaiso, Indiana
- Supported students with challenging assignments
- Answered questions students had regarding their labs

Teaching Assistant, Meteorological Computer Applications August 2018 – December 2018
Department of Geography and Meteorology, Valparaiso University, Valparaiso, Indiana
- Aided students in developing coding skills and writing scripts in Fortran and Python
- Supported faculty through grading and students with review sessions

Project Advisor, Introduction to Data Science January 2018 – May 2018
Department of Geography and Meteorology, Valparaiso University, Valparaiso, Indiana
- Met with microclimate research group and answered any potential questions
- Provided guidance for developing research methods

Teaching Assistant, Introduction to Meteorology August 2018 – December 2018
Department of Geography and Meteorology, Valparaiso University, Valparaiso, Indiana
- Graded lab assignments and answered students' questions
- Coordinated review sessions and created content to help students review for exams

Recognition

Argonne Impact Award for Extraordinary Effort August 2023
Argonne National Laboratory, Lemont, Illinois
- Co-led and mentored a large student cohort focused on urban climate in Chicago, Illinois
- Dealt with a challenging safety situation, ensuring swift action was taken

ARM Service Award for Outstanding Effort and Contributions August 2023
DOE Atmospheric Radiation Measurement User Facility, Washington, D.C.
- Led critical contributions to several different projects and initiatives such as the Python ARM Radar Toolkit
- Led outreach efforts to educate people on how they can use open-source tools to work with ARM data

CISL Outstanding Achievement Award – Dedication to Python Education Efforts December 2021
National Center for Atmospheric Research, Boulder, Colorado
- Achievement for effort related to developing educational materials for Python for the Geosciences
- Lead a variety of tutorials and workshops focused on contributing content to the project

Outstanding Poster Presentation – AMS Weather Analysis and Forecasting (WAF) Conference January 2020
100th Annual American Meteorological Society Meeting, Boston, Massachusetts
- Presented during the joint session with WAF/NWP, Python, and EIPT
- Based on academic merit, presented at the AMS Annual Meeting in Phoenix, Arizona

Outstanding Leadership and Service Award May 2019
Valparaiso University Office of Student Affairs, Valparaiso, Indiana
- American Meteorology Society senior named scholarship
- Based on academic merit, presented at the AMS Annual Meeting in Phoenix, Arizona

Bhanwar Lal Bahethi Scholarship January 2019
Science Systems and Applications Incorporated, Lanham, Maryland
- American Meteorology Society senior named scholarship
- Based on academic merit, presented at the AMS Annual Meeting

Better Business Bureau of Wisconsin Student of Integrity March 2015
- 7 scholarships awarded statewide
- Based on student involvement and community engagement

Grants

Creative Work and Research Committee, "Undergraduate Research Grant", $704 August 2018 – May 2019
- Student driven research focused on using Raspberry Pi clusters to run the WRF model
- Coordinated efforts between the computer science and meteorology departments in addition to NCAR

Civic Service and Community Engagement

SciPy Conference Earth, Geo, Atmosphere, and Ocean Track Co-Chair January 2022 – Present
Scientific Python Conference Planning Committee, Austin, Texas
- Student member focused on increasing community engagement
- Aid in planning annual EIPT symposium at the annual meeting

AMS Board on Environmental Information Processing Technologies January 2020 – Present
American Meteorological Society, Boston, Massachusetts
- Student member focused on increasing community engagement
- Aid in planning annual EIPT symposium at the annual meeting

Midwest Student Conference for Atmospheric Research Co-Chair January 2020– Present
University of Illinois at Urbana-Champaign, Urbana, IL
- Coordinated efforts in planning a research conference including over 40 talks and posters
- Recruited over 200 conference attendees and two keynote speakers to attend the meeting

School of Earth Society and the Environment Research Review Co-Chair December 2020 – February 2020
University of Illinois at Urbana-Champaign, Urbana, IL
- Collaborate with members of the planning committee to plan annual research symposium
- Actively recruit members of the atmospheric science department to submit proposals

Deputy Director May 2018 – May 2019
Valparaiso University Storm Intercept Team
- Led forecast discussions and determine whether to chase
- Coordinated training exercises for new members and current members

Publications

Feldman, D.R., Aiken, A.C., Boos, W. R., Carroll, R.W.H., Chandrasekar, V., Collis, S., Creamean, J. M., de Boer, G., Deems, J., DeMott, P. J., Fan, J., Flores, A. N., Gochis, D., **Grover, M**., Hill, T. C. J., Hodshire, A., Hulm, E., Hume, C. C., Jackson, R., Junyent, F., Kennedy, A., Kumjian, M., Levin, E. J. T., Lundquist, J. D., O'Brien, J., Raleigh, M. S., Reithel, J., Rhoades, A., Rittger, K., Rudisill, W., Sherman, Z., Siirila-Woodburn, E., Skiles, S. M., Smith, J. N., Sullivan, R. C., Theisen, A., Tuftedal, M., Varble, A. C., Wiedlea, A., Wielandt, S., Williams, K., & Xu, Z. (2023). The Surface Atmosphere Integrated Field Laboratory (SAIL) Campaign. Bulletin of the American Meteorological Society (published online ahead of print 2023). https://doi.org/10.1175/BAMS-D-22-0049.1

Long, M. C., Moore, J. K., Lindsay, K., Levy, M., Doney, S. C., Luo, J. Y., Krumhardt, K. M., Letscher, R. T., **Grover, M.,** and Sylvester, Z. T.: Simulations With the Marine Biogeochemistry Library (MARBL), J. Adv. Model. Earth Sy., 13, e2021MS002647, https://doi.org/10.1029/2021MS002647, 2021.

Nesbitt, S. W., Salio, P. V., Ávila, E., Bitzer, P., Carey, L., Chandrasekar, V., Deierling, W., Dominguez, F., Dillon, M. E., Garcia, C. M., Gochis, D., Goodman, S., Hence, D. A., Kosiba, K. A., Kumjian, M. R., Lang, T., Luna, L. M., Marquis, J., Marshall, R., McMurdie, L. A., de Lima Nascimento, E., Rasmussen, K. L., Roberts, R., Rowe, A. K., Ruiz, J. J., São Sabbas, E. F., Saulo, A. C., Schumacher, R. S., Skabar, Y. G., Toledo Machado, L. A., Trapp, R. J., Varble, A. C., Wilson, J., Wurman, J., Zipser, E. J., Arias, I., Bechis, H., & **Grover, M.** (2021). A Storm Safari in Subtropical South America: Proyecto RELAMPAGO, *Bulletin of the American Meteorological Society*, **102(8)**, E1621-E1644.

Trapp, R. J., Kosiba, K. A., Marquis, J. N., Kumjian, M. R., Nesbitt, S. W., Wurman J., Salio P., **Grover, M.**, Robinson P., and Hence D. A., Multiple-platform and multiple-Doppler radar observations of a supercell thunderstorm in South America during RELAMPAGO. *Mon. Wea. Rev.*, **148**, 3225–3241.

Arms, S., J. Chastang, **M. Grover**, J. Thielen, M. Wilson, and D. Dirks, Introducing Students to Scientific Python for Atmospheric Science. *Bull. Amer. Meteor. Soc.*, **101**, E1492–E1496.

Conference Presentations

Oral Presentations

Grover M., Collis S., Sherman Z., Jackson R. C., Mühlbauer K., Michelson D., Theisen A., O'Brien J. R., Dixon M., Rose B., Tyle K., Kent J., Camron D., (September 2023). "Open Radar Cookbooks for All", 40th American Meteorological Society Conference on Radar Meteorology, Minneapolis, Minnesota

Grover M., Collis S., Sherman Z., Ilhi M., Kumar J., Jackson R. C., Theisen A., O'Brien J. R., Rose B., Tyle K., Kent J., Camron D., (June 2023). "Contributing to Open Data and Open Science", Unidata Triennial Users Workshop, Boulder, Colorado

Grover M., Collis S., Sherman Z., Ilhi M., Kumar J., Jackson R. C., Theisen A., O'Brien J. R., Rose B., Tyle K., Kent J., Camron D., (January 2023). "ARMing the Open Science Community with Radar Cookbooks: from the Colorado Rockies to the Gulf Coast and Beyond", American Meteorological Society Annual Meeting, Denver, Colorado

Grover M., Collis S., Sherman Z., Jackson R. C., Mühlbauer K., Michelson D., Theisen A., O'Brien J. R., Dixon M., (December 2022). "Open Radar Science in Action", American Geophysical Union Fall Meeting, Chicago, Illinois

Grover M., Banihirwe A., Long M., Paul K., Cherian D., Levy M., Kent J., Camron D., (January 2022). "Rethinking CESM Diagnostics through the Lens of Earth System Data Science", American Meteorological Society Annual Meeting, Houston, Texas

Grover M., Trapp R**.,** Bedka K., Marion G., Nesbitt S., Di Girolamo L., (January 2021). "Overshooting Top Area Dashboard: A New Resource for Characterizing Deep Convection in Real Time", American Meteorological Society Annual Meeting, New Orleans, Louisiana

Nesbitt S., Zea L. **Grover M.,** Trapp R**.**, Varble A., Chandrasekar V., Arias I., Lang T., Bedka K., (January 2021). "Perspectives on deep convective updraft modes using multi-sensor remote sensing data from RELAMPAGO-CACTI", American Meteorological Society Annual Meeting, New Orleans, Louisiana

Grover M., Trapp R., Nesbitt S**.**, Di Girolamo L., Kosiba K., (December 2020). "The Observed Relationship Between GOES-16 Derived Overshooting Top Area and Midlevel Updraft Area", American Geophysical Union Annual Meeting, San Francisco, California

Nesbitt S., Zea L. **Grover M.,** Trapp R**.**, Varble A., Chandrasekar V., Arias I., Lang T., Bedka K., (January 2021). "Perspectives on deep convective updraft modes using multi-sensor remote sensing data from RELAMPAGO-CACTI", American Geophysical Union Annual Meeting, San Francisco, California

Mallinson H., **Grover M.,** Trapp R**.**, (November 2019). "The Influence of Terrain and Environment on Cold Pools during RELAMPAGO", American Meteorological Society Annual Meeting, Boston, Massachusetts

Trapp R**.**, **Grover M.,** Mallinson H., (November 2019). "The Dynamical Coupling of Convective Updrafts, Downdrafts and Cold Pools during RELAMPAGO", RELAMPAGO Data Analysis Workshop, Buenos Aires, Argentina

Grover M., May R., Bruick Z., (August 2019). "METAR to Surface Maps: Transforming Text from Ugly Text into Beautiful Maps", Unidata End of Summer Seminar Series, Boulder, Colorado

Grover M., Czarnetzki A., Bingqing L., (July 2018). "Tornado Path Detection Using Hyperspectral Imaging: Analysis of the 2011 Super Outbreak in West-Central Alabama", UNI NSF REU IDREHSI Student Conference

Clark C., **Grover M.,** Sessa M., Mehner A., Evans C., (April 2018). "Seasonal Prediction of Lake Effect Snow", Great Lakes Meteorology Conference, Valparaiso, Indiana

Poster Presentations

Grover M., May R., (July 2020). "MetPy's Meteorological Data Parsing Abilities: From Surface to Upper Air", Scientific Python Conference, Austin, Texas

Grover M., Goebbert K., May R., Bruick Z., (January, 2020). "Declarative Surface Station Plots: The Next Stop on the GEMPAK Replacement Roadmap for MetPy", American Meteorological Society Annual Meeting, Boston, Massachusetts

Grover M., May R., Bruick Z., (October, 2019). "METAR to Surface Station Plots: Transforming Ugly Text into a Beautiful Map", Midwest Student Conference on Atmospheric Research, Urbana, IL

Grover M., Arseneau I., Foust E., Rosasco N., Wade T., Goebbert K., (January 2019). "The Effectiveness of a Raspberry Pi Cluster to Perform WRF Simulations for Enhancing Computational Resources within the Valparaiso University Meteorology Program", 2019 AMS Student Conference
Grover M., Czarnetzki A., Bingqing L., (January 2019). "Tornado Path Detection Using Hyperspectral Imaging: Analysis of the 2011 Super Outbreak in West-Central Alabama", 2019 AMS Student Conference

Grover M., Czarnetzki A., Bingqing L., (July 2018) "Tornado Path Detection Using Hyperspectral Imaging: Analysis of the 2011 Super Outbreak in West-Central Alabama", UNI NSF REU IDREHSI Student Conference, Cedar Falls, Iowa

Grover M., Patterson T., Schmitt K. (April 2018). "Microclimates at the Indiana Dunes National Lakeshore", Great Lakes Meteorology Conference, Valparaiso, Indiana

Grover M., Jewell C., Levandowski B., (May 2017). "USGS Indiana Dunes Microclimate Existence Exploration", Symposium on Undergraduate Research and Creative Expression (SOURCE), Valparaiso, Indiana

Memberships

American Meteorological Society/National Weather Society August 2015 – Present
- Attend conferences and attend speaking events
- Develop communication skills through workshops and networking events

American Geophysical Union August 2018 – Present
- Attend conferences and attend speaking events
- Develop communication skills through workshops and networking events

Chi Epsilon Pi Meteorology Honor Society February 2016 – May 2019
- Mentored freshmen students within the department and provide insight on how to succeed within the program
- Visited area schools to educate children about science through experiments and Q/A sessions

Order of Omega November 2018 – May 2019
- Fraternity and sorority life honor society consisting of the top 3% of the community
- Dedicated to leadership, service, and high academic achievement

References

Robert Jeffrey Trapp, Department Chair
Department of Atmospheric Sciences
University of Illinois at Urbana-Champaign
(765) 427-0550 jtrapp@illinois.edu

Stephen Nesbitt, Professor
Department of Atmospheric Sciences
University of Illinois at Urbana-Champaign
(217) 244-3740 snesbitt@illinois.edu

Kevin Goebbert, Associate Professor
Department of Geography and Meteorology
Valparaiso University
(219) 464-5517 kevin.goebbert@valpo.edu