

## **32<sup>nd</sup> Annual Iowa State University Atmospheric Science Undergraduate Research Symposium**

Monday, December 9, 2024

The Atrium of Hach Hall, Iowa State University

The Senior Thesis Program is designed to provide in-depth experience with guided professional inquiry for all atmospheric science graduates. The program consists of original research done in collaboration with a mentor who may be a faculty member or other professional meteorologist or researcher. The students' findings are reported in the written theses and are presented orally at the Iowa State University Atmospheric Science Undergraduate Research Symposium. In addition, the symposium includes presentations by concurrent BS/MS students, who are part of this year's senior class and will present progress so far on their MS research. Presentations are open to the general public. Faculty, staff, and students are encouraged to attend. Family and friends of presenters are especially welcome.

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| <b>9:15 AM</b>  | <b>Symposium Opening Remarks</b><br>Dr. Christina M. Patricola, Instructor, Senior Research (MTEOR 4990)   |
| <b>9:30 AM</b>  | <b>The 2020-2024 Iowa Drought: Effects of Mid-Latitude Storm Track Variability</b><br>Braydon P. Songer<br>Mentor: Dr. Ian N. Williams   |
| <b>9:45 AM</b>  | <b>Insights into Seasonal ENSO Prediction using the ENSO Longitude Index</b><br>Michael Ruth<br>Mentors: Dr. Christina M. Patricola and Nathan Erickson  |
| <b>10:00 AM</b> | <b>ENSO Influence on Derecho and Derecho-like MCS Occurrence in the United States</b><br>Michael Joseph Sniffin<br>Mentor: Dr. William A. Gallus Jr.   |
| <b>10:15 AM</b> | <b>Impact of Climate Change on Intense Derecho Events Using the Pseudo-Global Warming Approach</b><br>Josh Schwarz (concurrent BS/MS student)<br>Graduate Advisors: Dr. William A. Gallus Jr. and Dr. Christina M. Patricola |
| <b>10:30 AM</b> | <b>Break</b>   |
| <b>10:45 AM</b> | <b>Wind Chill Trends in North America from 1940-2023</b><br>Austyn Brooke Rayel Hartwig<br>Mentor: Dr. Christina M. Patricola  |

- 11:00 AM**      **Effects of Adverse Winter Weather Conditions on Car Accidents in Minnesota**  
Kai Kerkow  
Mentors: Nicholas Carletta and Ryan Dunleavy, NWS Twin Cities  
ISU co-mentor: Dr. Christina M. Patricola
- 11:15 AM**      **Detecting Snow Trends Under a Changing Climate in the Midwestern United States**  
Lauren Elizabeth Bader  
Mentor: Dr. Kristie J. Franz
- 11:30 AM**      **Comparison of Radar Predictors for Downbursts in Humid and Dry Environments**  
David Hultman  
Mentor: Dr. Ian N. Williams
- 11:45 AM**      **Lunch**
- 1:00 PM**      **Comparing Evapotranspiration between APSIM Crop Model and Eddy-Covariance Observations in the U.S. Corn Belt**  
Stefan S. Sundin  
Mentors: Dr. Brian K. Hornbuckle, Emma K. Safranek, and Matthew G. Kavanaugh
- 1:15 PM**      **Influences of Land Surface Fluxes on Wind Turning in the Planetary Boundary Layer**  
Douglas D. Falter (concurrent BS/MS student)  
Graduate Advisor: Dr. Ian N. Williams
- 1:30 PM**      **Effects of Spatial Heterogeneity on Convective Triggering of Thunderstorms in the Southeast U.S.**  
Matthew Richard Crook  
Mentor: Dr. Ian N. Williams
- 1:45 PM**      **Influence of the Low-Level Jet on Wind Ramps in Iowa**  
Kelly L. Radelet  
Mentor: Dr. William A. Gallus Jr.
- 2:00 PM**      **Break**
- 2:15 PM**      **Analysis of Counter-Intuitive Machine Learning Probabilities of Severe Convective Wind Reports**  
Alexander Hamilton  
Mentor: Dr. William A. Gallus Jr.

**2:30 PM      Influence of Anthropogenic Climate Change on Tropical Cyclone Wind Fields**

Jacob Olson

Mentor: Dr. Christina M. Patricola

**2:45 PM      Evaluating Public Understanding of Tornadoes and Their Hazards: A Survey of Students, Faculty, and Staff at Iowa State University**

Bryce Charles Bruggeman

Mentor: Dr. Lindsay C. Maudlin

**3:00 PM      Climate Change Effects on Daily and Yearly Tornado Frequency**

Peter Galliher

Mentor: Dr. William A. Gallus Jr.

**3:15 PM      Symposium Closing Remarks and photo**

Dr. William A. Gallus Jr., Associate Chair, Department of the Earth, Atmosphere, and Climate