

33rd Annual Iowa State University Atmospheric Science Undergraduate Research Symposium

Wednesday, December 10, 2025

Sun Room, Memorial Union, 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.

8:50 AM Symposium Opening Remarks

Dr. Christina Patricola-DiRosario, Instructor, Senior Research (MTEOR 4990)

9:00 AM Wildfire Behavioral Analysis: Investigating the Relationship between Atmospheric Levels and Pyroconvection

David Foster

Mentor: Braeden Winters

Co-mentor: David Flory

9:15 AM A Storm Report and Crop Damage-Based Hail Climatology of Nebraska

Grace (Reese) Kilworth

Mentor: Dennis Todey

Co-mentor: David Flory

9:30 AM Machine-Learning Bias Correction of HRRR Model Wind Gusts for Linear Storm Modes

Eliot Morrow

Mentor: Dr. Ian N. Williams

9:45 AM Assessing the Change in Responses to Extreme Weather after Experiences with Tornadoes, Hurricanes, and Fires

Sara Adams

Mentor: Dr. Lindsay Maudlin

10:00 AM Using Climatology to Evaluate Short-term Warm Season Derecho Predictability in Iowa

Jonathan M. Siemianowski

Mentor: Matthew T. Friedlein

Co-mentor: David Flory

10:15 AM	Break
10:30 AM	Assessment of the Relationship between Theta-E Gradients on Upscale Convective Growth in the Great Plains of the United States Sophie M. Miller Mentor: Samuel B. Ritter Co-mentor: Dr. William A. Gallus Jr.
10:45 AM	Assessing the Accuracy of Tools to Forecast the EF Strength of Tornadoes Sean Kovach Mentor: Michael Kochasic Co-mentor: David Flory
11:00 AM	Analysis of Radar Characteristics and Forecasting of the April 26th, 2024 Supercell Outbreak Zion Guerrero Mentors: Dr. Rachel Miller and Thea Sandmael Co-mentor: David Flory
11:15 AM	Influence of Global Climate Oscillations on Tornado Variability & Subseasonal-to-Seasonal Predictability in Iowa Hunter John Williams Mentor: Jeffrey Duda Co-mentor: Dr. Christina Patricola-DiRosario
11:30 AM	Temperature Maximums and Vapor Pressure Deficit Effects on Corn Growth in Iowa Linnea Stark Mentors: Dr. Andy VanLoocke and Marissa Osterloh
11:45 AM	Lunch
12:45 PM	Factors Controlling the Intensity, Structure, and Timing of Extreme Rainfall in U.S. Landfalling Tropical Cyclones Caleb Black (concurrent BS/MS student) Graduate Advisor: Dr. Robert Nystrom
1:00 PM	Aerial Reconnaissance Impacts of Tropical Cyclone Track and Intensity Forecasts Jordan Patricia Howell Mentor: Dr. Robert Nystrom
1:15 PM	Atmospheric and Oceanic Influences on North American Atlantic Tropical Cyclone Landfall Rate John Muldoon Mentor: Dr. Christina Patricola-DiRosario

- 1:30 PM The Perfect Storm x5: Environmental Anomalies during an Unprecedented Period of Five Simultaneous Tropical Cyclones**
Jax Thomas Stelzer
Mentor: Dr. Robert Nystrom
- 1:45 PM Convective Initiation as a Result of Sea Breeze Circulations**
Evan Michael Haag
Mentor: Dr. Ian N. Williams
- 2:00 PM Break**
- 2:15 PM Correlating Average Recurrence Interval Rainfall to River Flooding Across Iowa**
Jason Carlson
Mentor: Dr. Kristie Franz
- 2:30 PM Forecasting Heavy Precipitation in the Southeastern United States**
Rachel Pokorski
Mentor: Brad Carlberg
Co-mentor: David Flory
- 2:45 PM Evaluating V-notch Supercell Structure and Effects on Downstream Flow**
Adriane A. Stamer-Fuentes
Mentor: Dr. Ian N. Williams
- 3:00 PM What Caused False Alarm Winter Storm Warnings in the Mississippi River Valley? January 5-6, 2025 Extreme Snowfall Event**
Blake Ian Hansen
Mentor: Justin Schultz
Co-mentor: David Flory
- 3:15 PM Evaluating Dual-Polarimetric Radar Nowcasting Methods for Heavy Snow**
Madeline Renee Medvec
Mentor: Dr. Ian N. Williams
- 3:30 PM Symposium Closing Remarks and photo**
Dr. William A. Gallus Jr., Associate Chair, Department of the Earth, Atmosphere, and Climate