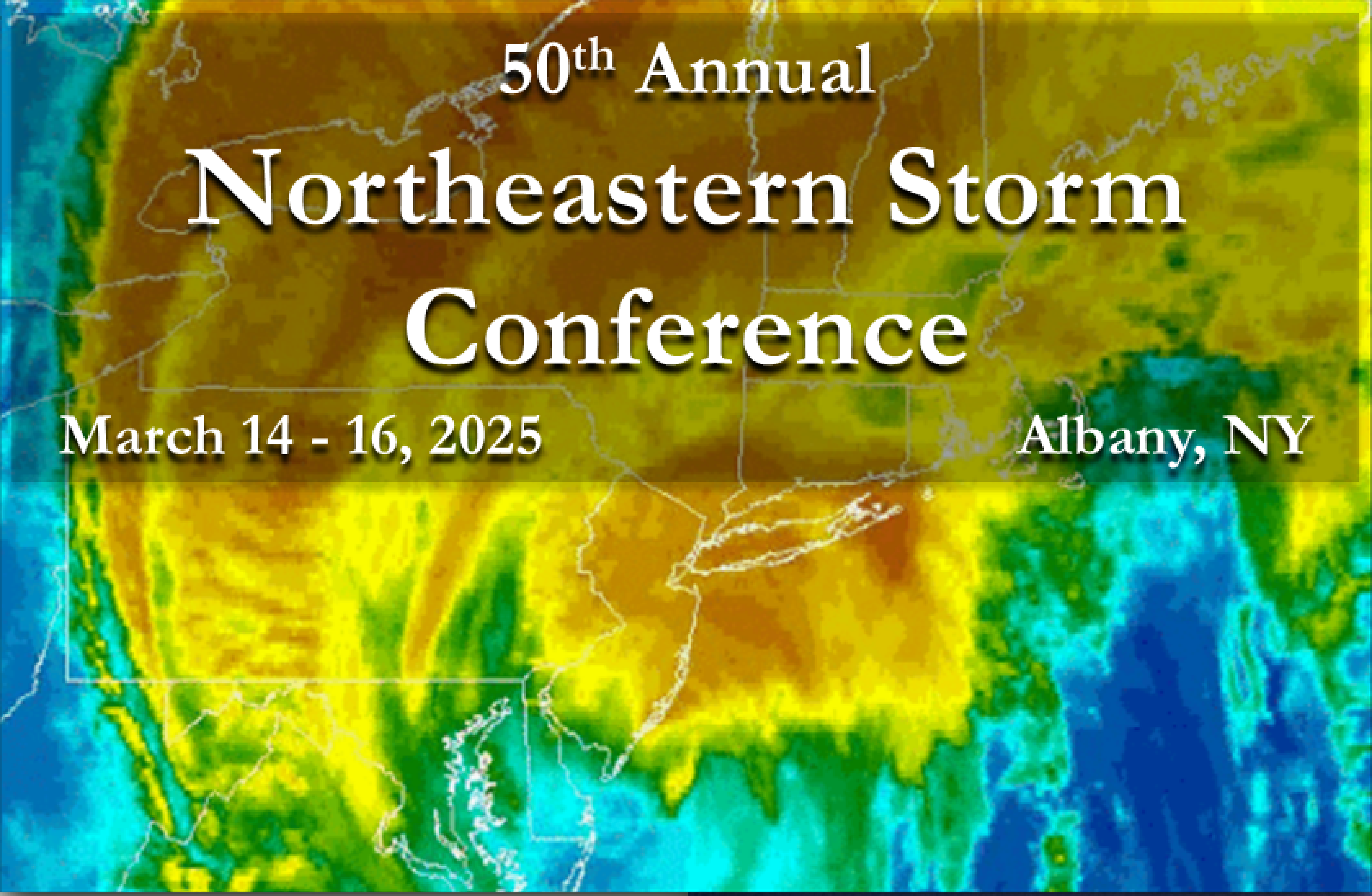
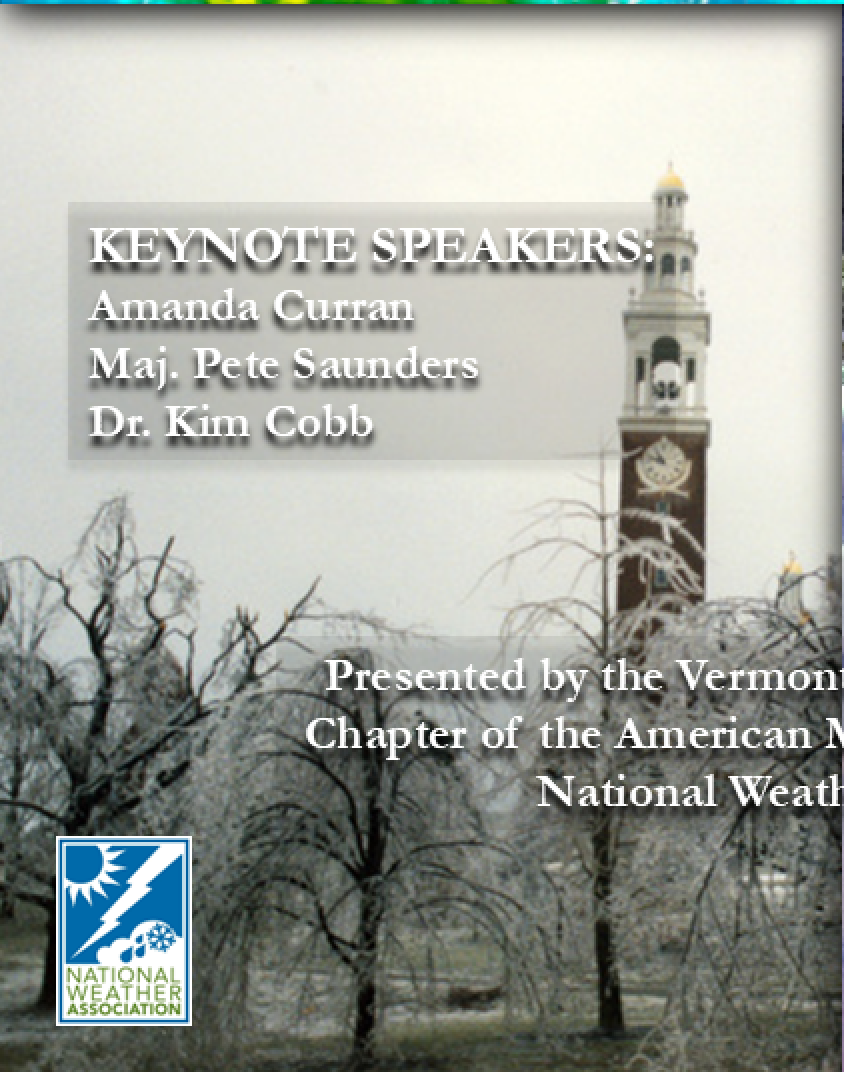


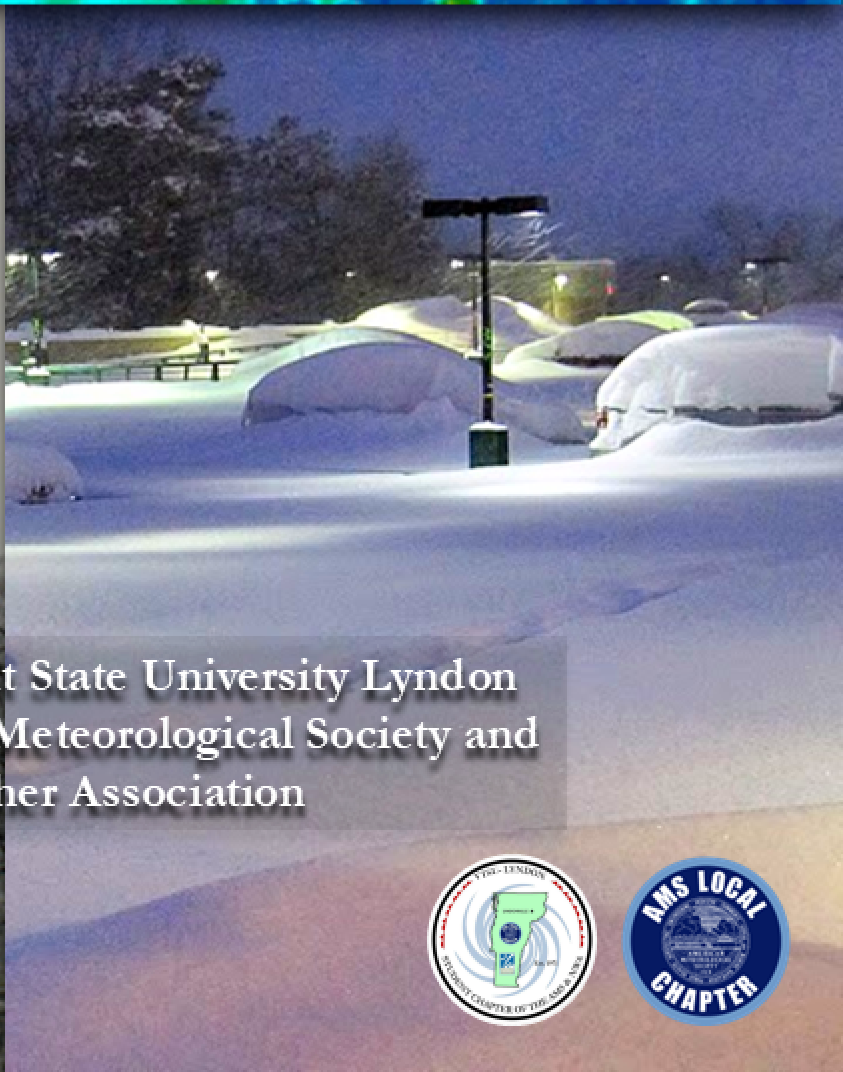
50th Annual

Northeastern Storm Conference

March 14 - 16, 2025

Albany, NY





KEYNOTE SPEAKERS:

Amanda Curran
Maj. Pete Saunders
Dr. Kim Cobb

Presented by the Vermont State University Lyndon Chapter of the American Meteorological Society and National Weather Association

NATIONAL WEATHER ASSOCIATION

AMS LOCAL CHAPTER

Dear Colleagues and Friends,

The VTSU Lyndon Student Chapter of the American Meteorological Society and National Weather Association welcomes you to the 50th Annual Northeastern Storm Conference (NESC) at the Hilton Albany in Albany, New York.

The Northeastern Storm Conference (NESC) holds the precedent as the nation's most extensive and historical student-led conference. With a rich history spanning decades, its evolution is a testament to the dedication and hard work of its participants. Initially launched in 1975 under the name Northeast Snow Conference, it began as a humble gathering of meteorology students at Lyndon State College. They came together for an informal session focused primarily on sharing and expanding their knowledge of meteorology, with a particular emphasis on winter weather phenomena. Following the inaugural event, the conference quickly expanded its scope, rebranding as the Northeastern Storm Conference to include a broader range of atmospheric science topics. Fifty years later, this once modest assembly has transformed into a three-day event, attracting hundreds of attendees from all over North America.

This year's NESC features three passionate individuals as our keynote speakers. Our Friday evening ice breaker speaker is Amanda Curran, an award-winning meteorologist at WSFA 12 News in Montgomery, Alabama. Major Pete Saunders is our Saturday night banquet speaker. Major Saunders is a U.S. Air Force officer and AI researcher serving at the Department of the Air Force (DAF)/Massachusetts Institute of Technology (MIT) Artificial Intelligence Accelerator. Lastly, our Sunday morning keynote is Dr. Kim Cobb. She is the Director of the Institute at Brown for Environment and Society and was a Lead Author for the IPCC Sixth Assessment Report.

I want to express my profound thanks to the entire VTSU Lyndon AMS & NWA Club, including Dr. Ari Preston, our esteemed faculty advisor, for his invaluable role in the success of this conference. My appreciation also extends to the executive board for their dedicated efforts in the conference's ongoing development. Our club deeply values the support from the VTSU Lyndon Student Government Association, which has generously allocated funds for NESC, as well as the accommodating staff at the Hilton Albany for their role in ensuring a smooth weekend, and the American Meteorological Society for sponsoring this year's conference. A special acknowledgment goes out to all our speakers, presenters, vendors, and participants for their unwavering support, enthusiasm, and insights, which are fundamental to the conference's success year after year. Your contributions are indispensable to us!

Every year, your feedback plays a crucial role in shaping this conference. I encourage you to take a moment to fill out the online survey at your convenience, sharing your thoughts and suggestions. While the conference has evolved significantly over the years, our core mission has always been to bring together the diverse elements of the atmospheric sciences community, fostering the growth of new knowledge and ideas. We trust that you will find this year's Northeastern Storm Conference both enlightening and fulfilling. We also look forward to welcoming you to the 51st Annual Northeastern Storm Conference in 2026!

Sincerely,

Andy McKeen

President and NESC Chairperson

A Special Thank You...

- To the Lyndon alumni who built this conference and made it the extremely successful event it has become, and who have continuously supported it over the last 50 years.
- To the members of the VTSU Lyndon AMS & NWA executive board and club for their incredible role in planning and putting on this conference, and for their friendship and support throughout the year.
- To the VTSU Lyndon AMS & NWA Faculty Advisor Dr. Ari Preston for the invaluable support and advice throughout the year.
- To the faculty and staff of the Atmospheric Science Department at VTSU Lyndon for their support and respect for the club.
- To the VTSU Student Government Association for their generous contributions to help make this conference possible year after year.
- To the staff at the Hilton Albany for working with us to run a successful, comfortable, and smooth conference.
- To the American Meteorological Society for their support of our conference through sponsorship and promotional help.
- To our guest speakers, Amanda Curran, Major Pete Saunders, and Dr. Kim Cobb, for their remarkable willingness to share their knowledge and experiences with everyone and lending their prestige to the conference.
- To our workshop leads for their eagerness to motivate and help our attendees grow and develop professionally.
- To all the poster and paper presenters at the conference, for sharing your hard work, furthering the science, and giving this conference the great name it has earned in our community.
- To all the students, professionals, and friends who attend the conference, for your eagerness to learn and enthusiasm to meet new people, making this all very worthwhile.

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Important Links

Conference Evaluation:

Please fill out the evaluation questionnaire at the link below or scan the QR code to provide feedback on all aspects of the conference and anything else you'd like to add. The VTSU Lyndon AMS & NWA executive board thanks you in advance and values your input highly.

https://tinyurl.com/50thNESC

Follow us on social media for the latest conference updates:

Bluesky: @lyndonamsnwa.bsky.social

Facebook: @nestormconf

Facebook: @lyndonamsnwa

Instagram: @lyndonamsnwa

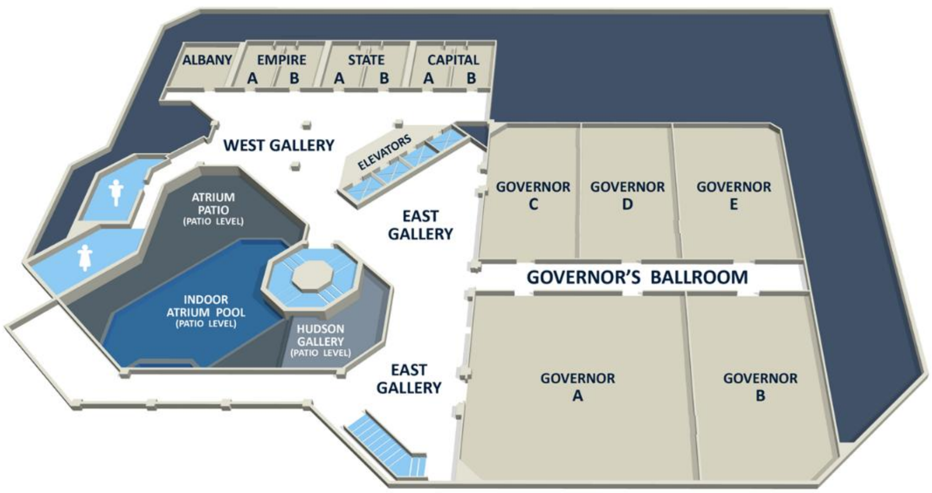
Twitter: @lyndonamsnwa

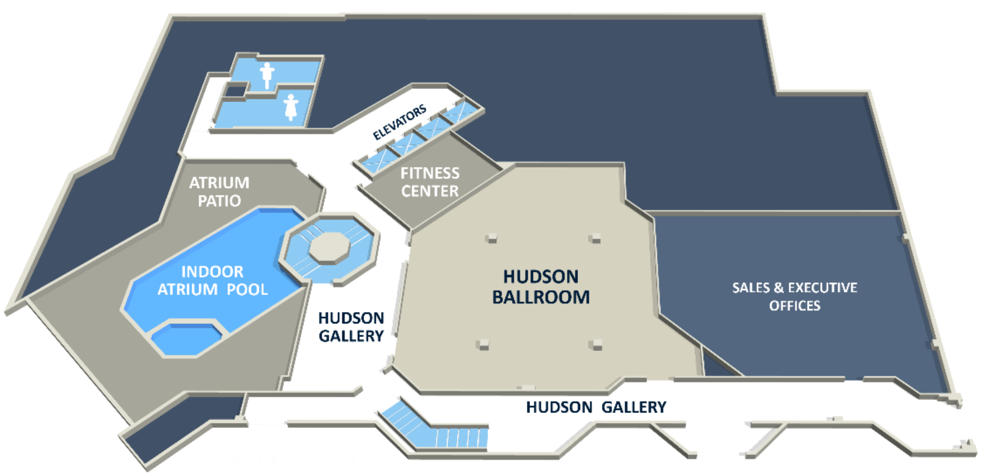
Forecast Challenge:

Compete in a forecasting challenge for the selected station during opening remarks. Forecasts are due by 12:00 AM on Saturday, and the forecast period is 6Z March 15^{th} (Saturday) to 6z March 16^{th} (Sunday). The winner will be announced on Sunday during the closing remarks and the winner must be present to claim their prize. If they are not present, the next most accurate forecast will receive the prize!

https://tinyurl.com/NESCWxChallenge

Map of the Hilton Albany





<u>Conference Agenda</u>

Friday, March 14th, 2025

The Gallery

1:15 PM – 5:15 PM	NYS Mesonet Tours *Registration Required*

The Gallery

2:00 PM – 8:00 PM	Registration and Check-In

Governor's Ballroom

7:45 PM – 8:00 PM	Opening Remarks
8:00 PM – 9:00 PM	Friday Night Ice Breaker **Keynote Speaker: Amanda Curran**
9:15 PM – 10:00 PM	Friday Night Social *Refreshments and ice cream will be served*

Saturday, March 15th, 2025

Hudson Ballroom

8:00 AM – 9:00 AM — Breakfast

Governor CDE

9:00 AM – 9:10 AM — Opening Remarks

Governor AB

Weather, Climate, and Society

9:15 AM – 9:30 AM

The Met Instruments Project: A Low-Cost, High Accuracy Weather Station Network

Quinton Kirsch – Met Instruments Project

9:30 AM – 9:45 AM

Empowering Climate Communicators: The Climate Consensus's Role in Supporting Climate Engagement and Outreach

Andrew Westgate - Vermont State University - Lyndon

Governor CDE

Extreme Precipitation

9:15 AM – 9:30 AM

An Overview of the High-Impact December 2023 East Coast Atmospheric River Event and its Predictability by Operational and WRF modeling systems

Peyton K. Capute - Center for Western Weather and Water Extremes, Scripps Institution of Oceanography, University of California San Diego

9:30 AM – 9:45 AM

Synoptic-Scale Evolution of the Extreme Precipitation Period of 4-25 February 2019 in Eastern North America

Yeechian Low - McGill University

9:45 AM – 10:00 AM

The Triple Point: Where Weather, Climate, and Society Meet
Michael Michaud - New York State Weather Risk Communication Center

9:45 AM – 10:00 AM

Developing a Framework for Evaluating Sources of Predictability for Extreme Events on Subseasonal Timescales in Southeast Asia & Latin America
Gabrielle Brown - University of Oklahoma

10:00 AM – 10:15 AM Break

Governor AB

Winter Weather I

10:15 AM – 10:30 AM

Lightning and Vortex Overview of the 18-19 Nov 2022 Storm during the Lake-Effect Electrification (LEE) Project
Kaitlin Farrell - SUNY Oswego

10:30 AM – 10:45 AM

A Time Series Analysis of Rain on Snow Events on the Summit of Mt. Washington
Charles Peachey - Mount Washington Observatory

Governor CDE

Severe Weather

10:15 AM – 10:30 AM

The Influence of Complex Terrain on the Turin, New York Tornado of 2023
Alex Kramer - University at Albany, SUNY

10:30 AM – 10:45 AM

A Multi-scale Analysis of the 16 July 2024 Significant Severe and Tornadic Event across New York and New England
Thomas A. Wasula - NOAA/National Weather Service, Albany, New York

10:45 AM – 11:00 AM

Evaluation of Planetary Boundary Layer Schemes during the Lake-Effect Electrification (LEE) Project 18-19 November 2022 Event Using the Weather Research and Forecasting – ELEC Model

Thomas White - SUNY Oswego

10:45 AM – 11:00 AM

Examining Right-Moving Supercell Environments with Doppler Wind LiDAR Observations

Bobby Saba - University of Oklahoma, School of Meteorology, Cooperative Institute for Severe and High-Impact Weather Research and Operations, Norman, OK

11:00 AM – 11:15 AM

A Review of the 23 March 2024 Northeast Winter Storm

Jon Palmer - National Weather Service, Weather Forecast Office - Gray, Maine

11:00 AM – 11:15 AM

Do "Immense" Supercell Updrafts Indicate Imminent Tornado Formation?

Michael M. French - Stony Brook University, Stony Brook, NY

Governor AB

11:20 AM – 12:00 PM Demo Reel Critique

Nick Gregory

Governor CDE

11:20 AM – 12:00 PM Resume Review Workshop

The Gallery

11:20 AM – 12:00 PM Poster Session and Vendor Fair

12:00 PM – 1:30 PM Break for Lunch

The Gallery

1:30 PM - 2:15 PM — Poster Session and Vendor Fair

Governor AB

Risk Communication

2:15 PM – 2:30 PM

GYX HeatRisk Examination

Ethan Mousseau - Plymouth State University

2:30 PM – 2:45 PM

Hidden Dangers: Investigating Thin Ice and Cold Water Boating Incidents across Vermont and Northern New York, 1990-2023

Dakota Wiley – VTSU Lyndon, NWS Burlington

2:45 PM – 3:00 PM

Enhancing Weather Risk Communication Strategies: The New York State Weather Risk Communication Center

Katie Bachli - Meteorologist at the State Weather Risk Communication Center

Michael Michaud - Communication Scientist at the State Weather Risk Communication Center

Governor CDE

Climate I

2:15 PM – 2:30 PM

Navigating Towards a Greener Future: The Maritime Industry's Evolution in Combating Climate Change

Allison Fitzpatrick - StormGeo

2:30 PM – 2:45 PM

Stationary Fronts across North America

Neil Laird - Hobart and William Smith Colleges

2:45 PM – 3:00 PM

The Saint-Lawrence River Valley Front: A Synoptic-Dynamic Climatology

Juliann Wray - McGill University

3:00 PM – 3:10 PM	Break

Governor AB

3:10 PM – 4:10 PM	Career Panel

Governor CDE

3:10 PM – 4:10 PM	Graduate School Panel
4:10 PM – 4:30 PM	Break

Governor's Ballroom

4:30 PM – 5:30 PM	Networking Tables

Hudson Ballroom

5:30 PM – 6:30 PM	Lyndon Alumni Reception

Governor's Ballroom

6:30 PM – 7:30 PM	Banquet Dinner
7:30 PM – 8:30 PM	Conference Remarks **Keynote Speaker: Maj. Pete Saunders**

Sunday, March 16th, 2025

Hotel Lobby

8:00 AM – 11:00 AM	Hotel Check Out

Hudson Ballroom

8:00 AM – 9:00 AM	Breakfast

Governor CDE

9:00 AM – 9:05 AM	Opening Remarks
9:05 AM – 10:05 AM	**Keynote Speaker: Dr. Kim Cobb**
10:05 AM – 10:30 AM	Break for Check Out

Governor CDE

10:30 AM – 11:15 AM	Women in Science Panel
	Gabrielle Brown
	Amanda Curran
	Kayla Lewis

Governor AB

Winter Weather II

11:15 AM – 11:30 AM

Multi-Scale Analysis of a Flash Freeze Event
Juliann Wray - McGill University

11:30 AM – 11:45 AM

The Lake-Effect Electrification (LEE) Project: Differences in Lightning Flash Characteristics During the 17-20 November 2022 Event
Bee Lamsma - SUNY Oswego

11:45 AM – 12:00 PM

Thermodynamic Factors Influencing a Heavy Mixed Precipitation Band within an Extratropical Cyclone
Kaitlyn R. Jesmonth - University of Illinois Urbana-Champaign

Governor CDE

Climate II

11:15 AM – 11:30 AM

Cropland Change in the Mississippi Delta: Panacea or Peril Amidst a Worsening Climate?
Brett Violett - Mississippi State University

11:30 AM – 11:45 AM

Development of Arctic zonal classification products: An ArcPy framework for analyzing 30 years of ECMWF reanalysis data to identify prevailing meteorological conditions.
Evan Barrett - Cold Regions Research and Engineering Lab, Oak Ridge Institute for Science and Education

11:45 AM – 12:00 PM

Connections of Cold-season Northern Hemisphere Extratropical Cyclone Characteristics to Common Climate Modes during 1950-2023
Matthew S. Lynne - University at Albany, State University of New York

Governor CDE

12:00 PM – 12:05 PM Closing Remarks

Guest List

Andy	McKeen	VTSU Lyndon AMS & NWA President
Nathan	Moore	VTSU Lyndon AMS & NWA Vice President
Brennen	Webb	VTSU Lyndon AMS & NWA Secretary
William	Perkins	VTSU Lyndon AMS & NWA Treasurer
Morgan	Fellows	VTSU Lyndon AMS & NWA Public Relations
Jordan	Arpin	VTSU Lyndon AMS & NWA Community Outreach
Dakota	Wiley	VTSU Lyndon AMS & NWA Historian
Benjamin	Cohen-Tyler	VTSU Lyndon AMS & NWA SGA Representative
Patrick	George	VTSU Lyndon AMS & NWA Committee Chair
Ari	Preston	VTSU Lyndon AMS & NWA Faculty Advisor
Phoenix	Bulger	VTSU Lyndon
Roberto	Canseco	VTSU Lyndon
Jason	Kaiser	VTSU Lyndon
Jason	MacRae	VTSU Lyndon
Charles	Schwenker	VTSU Lyndon
Michael	Spencer	VTSU Lyndon
Andrew	Westgate	VTSU Lyndon
Chase	Abbott	VTSU Lyndon Alumni
John	Currier	VTSU Lyndon Alumni
Denzyl	Wilson	VTSU Lyndon Prospective Student
Sam	Ey	VTSU Lyndon Prospective Student
Josh	Nichols	7 News, WKBW-TV, Buffalo, NY
Alex	DaSilva	AccuWeather
Renee	Duff	AccuWeather
Danielle	Ehresman	AccuWeather
Anthony	Macari III	ANJ Electric Eye
Peyton	Capute	Center for Western Weather and Water Extremes
Avinash	Aravind	Cornell University

Melina	Chapula	Cornell University
Evelyn	Keefe	Cornell University
Cullen	Slattery	Cornell University
Shawn	Wallace	Cornell University
Dylan	Wright	Cornell University
Megan	Duncan	Fairbanks Museum & Planetarium
Serena	Macari	Hinckley Allen
Neil	Laird	Hobart & William Smith Colleges
Louis	Karlovits	HWS Geoscience
Kim	Cobb	IBES - Brown University
Shawne	Deary	LSC Class of '90
Lillie	Farrell	Maine Department of Environmental Protection
Yeechian	Low	McGill University
Juliann	Wray	McGill University
Quinton	Kirsch	Met Instruments Project
Brett	Violett	Mississippi State University
Christopher	Legro	National Weather Service
James	Sinko	National Weather Service WFO Caribou, Maine
Anthony	Carpino	NBC - CT
Scott	Whittier	NOAA/NWS Burlington, VT
Katie	Bachli	NY State Weather Risk Communication Center
Michael	Michaud	NY State Weather Risk Communication Center
Sam	Cherubin	NYS Mesonet
Craig	Johnson	Optimal Energy, an NV5 Company
Bobby	Saba	OU/CIWRO
Lourdes	Aviles	Plymouth State University
Eric	Hoffman	Plymouth State University
David	Zywiczynski	Plymouth State University
Alaina	Adderley	Plymouth State University AMS Chapter

Christian	Bach	Plymouth State University AMS Chapter
Finn	Blomberg	Plymouth State University AMS Chapter
Andrew	Buckley	Plymouth State University AMS Chapter
Emma	Burke	Plymouth State University AMS Chapter
Emma	Butts	Plymouth State University AMS Chapter
Angelo	DeLuca	Plymouth State University AMS Chapter
Jackson	Diglio	Plymouth State University AMS Chapter
Chloë	Galyean	Plymouth State University AMS Chapter
Jacob	Garside	Plymouth State University AMS Chapter
Rachel	Horak	Plymouth State University AMS Chapter
Athena	Moore	Plymouth State University AMS Chapter
George	Mousmoules	Plymouth State University AMS Chapter
Joel	Newman	Plymouth State University AMS Chapter
David	Pessin	Plymouth State University AMS Chapter
Genevieve	Picciano	Plymouth State University AMS Chapter
Shane	Schirmer	Plymouth State University AMS Chapter
Justin	Smith	Plymouth State University AMS Chapter
Mathew	Taylor	Plymouth State University AMS Chapter
James	Whitney	Plymouth State University AMS Chapter
Maxim	Couillard	Purdue University
Michael	French	Stony Brook University
Jaci	Baijnath	Stony Brook University Meteorology Club
Siena	Bitetto	Stony Brook University Meteorology Club
Juniper	Chien	Stony Brook University Meteorology Club
Carolina	Corcuera	Stony Brook University Meteorology Club
Christian	Diaz	Stony Brook University Meteorology Club
Cassandra	Fastag	Stony Brook University Meteorology Club
Brian	Friedlander	Stony Brook University Meteorology Club
Isabella	Gagliano	Stony Brook University Meteorology Club

Kenny	Gregory	Stony Brook University Meteorology Club
Julian	Henderson	Stony Brook University Meteorology Club
Saina	Jiang	Stony Brook University Meteorology Club
Stamatia	Katsaros	Stony Brook University Meteorology Club
Alexander	LaPorte	Stony Brook University Meteorology Club
Alexandria	Marhone	Stony Brook University Meteorology Club
Samantha	McKay	Stony Brook University Meteorology Club
Jacob	Olveira	Stony Brook University Meteorology Club
Jake	Surace	Stony Brook University Meteorology Club
Emily	Wu	Stony Brook University Meteorology Club
Michael	Bakke	StormGeo
James	Bielli	StormGeo
Allison	Fitzpatrick	StormGeo
Peter	Rossi	StormGeo
Michael	Swan	StormGeo
Scott	Rochette	SUNY Brockport
Reid	Buchanan	SUNY Oneonta
Sofia	Gould	SUNY Oneonta
Aiden	Messier	SUNY Oneonta
Evan	Biedron	SUNY Oswego
Ezekiel	Caldon	SUNY Oswego
Kristopher	Convis	SUNY Oswego
Kaitlin	Farrell	SUNY Oswego
Miles	Gray	SUNY Oswego
Sarah	Gryskewicz	SUNY Oswego
George	Kirk	SUNY Oswego
Erik	Knudsen	SUNY Oswego
Bee	Lamsma	SUNY Oswego
Tyler	Lucia	SUNY Oswego

Brendan	Rice	SUNY Oswego
David	Rienzo	SUNY Oswego
Logan	Rounds	SUNY Oswego
Cody	Schiller	SUNY Oswego
Emma	Seckner	SUNY Oswego
Jordan	Thirlwall	SUNY Oswego
Thomas	White	SUNY Oswego
Sam	Collins	The Weather Company
Kaitlyn	Jesmonth	UIUC
Alex	Colgate	University at Albany
Kristen	Corbosiero	University at Albany
Alex	Kramer	University at Albany
Liam	Terhune	University at Albany
Jacob	Vile	University at Albany
Taylor	Leitch	University of Rhode Island
Alexander	Jacques	University of Utah
Jonathan	Chambers	University of Wisconsin Madison
Evan	Barrett	U.S. Army Corps of Engineers, Cold Regions Research and Engineering Lab
Lucas	Clover	USA Weather Incorporated
Caitlin	Lawrence	USA Weather Incorporated
Richard	Menkel	USA Weather Incorporated
Matt	Condon	WATE-TV
Alex	Avalos	Weather Routing Inc.
Justin	Bettenhauser	Weather Routing Inc.
Thomas	Cerra	Weather Routing Inc.
Michael	Cooke	Weather Routing Inc.
Jeremy	Davis	Weather Routing Inc.
Scott	Drake	Weather Routing Inc.
Victoria	Katze	Weather Routing Inc.

Kevin	Kelley	Weather Routing Inc.
Luke	Morin	Weather Routing Inc.
Kyle	Petroziello	Weather Routing Inc.
Matt	Rolph	Weather Routing Inc.
Rob	Eisenson	Western Connecticut State University
Allison	French	Western Connecticut State University
Cameron	Kurasz	Western Connecticut State University
Logan	Metzler	Western Connecticut State University
Luke	Theriault	Western Connecticut State University
Jason	Doris	WJAR
Nick	Gregory	WNYW TV Fox 5 News, New York City
Amanda	Curran	WSFA 12 News - Montgomery
Stephen	Chapron	
Adam	Froehlig	
Laura	Johnson	
Michael	Mozer	
Gina	Radice Lalumiere	
Rosemary	Webb	
James	Wilson	

Vendors

AccuWeather

Fairbanks Museum & planetarium

NYS Mesonet
University at Albany

Purdue University
Department of Earth, Atmospheric, and Planetary Sciences

Plymouth State Meteorology

StormGeo
Part of Alfa Laval

The Climate Consensus

USA Weather Incorporated

WRI
Weather Routing Inc.

Friday Night Keynote

Amanda Curran

Amanda Curran joined WSFA 12 News in July 2014 as a Meteorologist. Before moving to the Heart of Dixie, Amanda grew up in New Hampshire and spent four years in Vermont; there she graduated with her bachelor's degree in Atmospheric Sciences and her associate's degree in Television Studies from Vermont State University, formerly known as Lyndon State College.

In her decade long career as a broadcast meteorologist, Amanda has had plenty of opportunity to cover it all! From snowstorms in the south to multiple rounds of severe weather (sometimes all within a couple of weeks), Alabama weather has continued to keep Amanda on her toes. Her work on air and in the field has been recognized by the Alabama Broadcaster's Association and Associated Press, along with the Southeast Regional Emmys and Edward R. Murrow organizations. In 2017 Amanda earned the American Meteorological Society's Certified Broadcast Meteorologist (CBM) designation, a professional recognition of the quality of her weather broadcasts.

On top of her weather duties, Amanda loves the opportunity to go out into the community and meet new people. In her free time Amanda enjoys running, watching football and baseball (go Patriots/BoSox!) and spending time outside with her shelter dog, Tanner.

Saturday Night Keynote

Major Pete Saunders

Major Pete Saunders is a U.S. Air Force officer and AI researcher serving at the Department of the Air Force (DAF)/Massachusetts Institute of Technology (MIT) Artificial Intelligence Accelerator in Cambridge, MA. Since June 2024, he has led AI research and development programs focused on advancing AI applications for defense and operational weather forecasting.

Maj Saunders has served in the Air Force since 2011, with operational assignments spanning weather forecasting, data assimilation, and AI-driven decision support. His career includes roles as a Wing Weather Officer, Weather Flight Commander, and Assistant Professor at the Air Force Institute of Technology (AFIT). He holds a Ph.D. in Atmospheric Science from the University of Utah, where his research focused on data assimilation and tropical cyclone dynamics. His recent work integrates AI with meteorological and environmental modeling to enhance military and civilian decision-making in complex operational environments.

Maj Saunders brings a wealth of experience in AI, atmospheric science, and military operations, making him a key contributor to the evolving intersection of AI and defense applications.

Sunday Morning Keynote

Dr. Kim Cobb

Kim Cobb is the Lawrence and Barbara Margolis Director of the Institute at Brown for Environment and Society, and Professor in Environment and Society as well as Earth, Environmental, and Planetary Sciences. As a climate scientist, she uses observations of past and present climate to advance our understanding of future climate change impacts, with a focus on climate extremes and coastal flooding. She received her B.A. from Yale University in 1996, and her Ph.D. in Oceanography from the Scripps Institute of Oceanography in 2002.

Prior to joining Brown in 2022, Kim served as Director of the Global Change Program at Georgia Institute of Technology, Professor in the School of Earth and Atmospheric Sciences, and ADVANCE Professor for Diversity, Equity, and Inclusion. She has received an NSF CAREER Award, a Presidential Early Career Award for Scientists and Engineers, and the Hans Oeschger Medal from the European Geosciences Union in 2019. She was elected as an AAAS Fellow in 2021, and was a Lead Author for the IPCC Sixth Assessment Report, released in 2021. In 2023 she was appointed to President Biden's Intelligence Advisory Board, and was elected as one of the 2023 American Geophysical Union's (AGU) Fellows.

As a mother to four, Kim is a strong advocate for women in science, and champions diversity and inclusion in all that she does. She is also devoted to the communication of climate change to the public through media appearances, public speaking, and social media channels, and enjoys frequent exchanges with policymakers about climate impacts and solutions.

Workshop Descriptions

Demo Reel Critique

This workshop offers aspiring broadcast meteorologists the opportunity to refine their demo reels through expert review. Renowned broadcast meteorologist Nick Gregory of WNYW-TV Fox 5 will provide live, constructive feedback to participating students. This session presents a valuable opportunity to gain critical insights into a key component of broadcast job applications. Observer participation is encouraged, allowing attendees to learn from the feedback provided and apply it to their future demo reel development.

Resume Workshop

Are you looking to get your resume reviewed by a professional? This workshop helps students improve their resume to increase chances of success in internships, graduate school, and future job opportunities. A range of highly qualified industry professionals from broadcast meteorologists to graduate school professors have graciously volunteered their time to sit down and help you improve your resume. If you submitted your resume when you registered, this workshop is mandatory.

Women in Science

This workshop invites all participants to explore the ongoing dialogue surrounding gender equity in the sciences. We will examine the persistent underrepresentation of women in STEM fields and discuss strategies for fostering a more inclusive environment. Panelists Amanda Curran, broadcast meteorologist at WSFA 12 News in Montgomery, Alabama; Kayla Lewis, a teacher in Earth and Space Science north of Troy, New York who's pursuing a Secondary Science Education with a focus on Earth Science; and Gabrielle Brown, a second-year Master's student in the School of Meteorology at the University of Oklahoma, will share their personal experiences and insights. The workshop aims to empower women in science to pursue ambitious goals and develop effective leadership strategies. An interactive question and answer session will allow attendees to directly engage with the panelists and enhance the discussion. Additionally, it will offer valuable perspectives for allies seeking to support gender equity within scientific workplaces.

Career Panelists

Jessica Langlois

Meteorologist – WCAX-TV

Jess Langlois works weekday evenings at WCAX-TV in Burlington, VT, alongside Chief Meteorologist Gary Sadowsky. Jess was born and raised in southern New Hampshire, where she developed a love for weather in elementary school. She went on to earn a B.S. in Atmospheric Science and an A.S. in Journalism from VTSU - Lyndon in 2019. During her time at Lyndon, Jess interned at WCVB-TV in Boston, WCAX-TV, and worked under the climate modeling team of the Basin Resilience to Extreme Events (BREE) project, examining the impact of Great Lake temperature perturbations on simulated downwind precipitation.

Jess started her career at WQOW-TV in Eau Claire, WI as a weekend meteorologist and multimedia journalist. She moved back to Vermont to join the WCAX weather team in 2021. Jess is responsible for the weekday 4 p.m. show and also serves as the team's primary graphic designer and pinch hitter for a wide variety of tasks. She was honored with the Vermont Association of Broadcasters 'Rising Star' Award in 2023.

Alex Avalos

Yacht Operations Manager - Weather Routing, Inc. (WRI)

Originally from Lisbon, CT, I attended what used to be Lyndon State College (now Vermont State University) and obtained my degree in Atmospheric Science. Immediately after graduating in the Spring of 2014, I worked at AccuWeather Enterprise Solutions in Wichita, KS as a Storm Warning Meteorologist. I joined Weather Routing in Glens Falls, NY in March of 2017 as a Synoptic Marine Meteorologist, and have since become an Operations Manager for our Yacht Division.

Major Pete Saunders

Officer/AI Researcher - U.S. Air Force

Major Pete Saunders is a U.S. Air Force officer and AI researcher serving at the Department of the Air Force (DAF)/Massachusetts Institute of Technology (MIT) Artificial Intelligence Accelerator in Cambridge, MA. Since June 2024, he has led AI research and development programs focused on advancing AI applications for defense and operational weather forecasting.

Maj Saunders has served in the Air Force since 2011, with operational assignments spanning weather forecasting, data assimilation, and AI-driven decision support. His career includes roles as a Wing Weather Officer, Weather Flight Commander, and Assistant Professor at the Air Force Institute of Technology (AFIT). He holds a Ph.D. in Atmospheric Science from the University of Utah, where his research focused on data assimilation and tropical cyclone dynamics. His recent work integrates AI with meteorological and environmental modeling to enhance military and civilian decision-making in complex operational environments.

Maj Saunders brings a wealth of experience in AI, atmospheric science, and military operations, making him a key contributor to the evolving intersection of AI and defense applications.

Graduate School Panelists

Dr. Andrew Westgate

Assistant Professor – Vermont State University Lyndon

Andrew is currently an assistant professor at Vermont State University - Lyndon. He received his B.S. degree in atmospheric sciences from Lyndon State College (now Vermont State University - Lyndon) and his M.S. and PhD from the University of Wisconsin - Milwaukee. There, his research focus was in climate dynamics. He serves on the board of directors for The Climate Consensus, a nonprofit organization whose focus is to bridge the gap between scientists and nonscientists with respect to anthropogenic climate change, as its vice president.

Dr. Kristen Corbosiero

Professor and Graduate Program Director – University at Albany

Dr. Kristen Corbosiero is a Professor and the Graduate Program Director in the Department of Atmospheric and Environmental Sciences at the University at Albany. She received her Master's and PhD from the University at Albany, and earned a BS with Distinction from Cornell University. Dr. Corbosiero's research focuses on understanding the interactions between tropical cyclones and the environments in which they are embedded. She has investigated this interaction using both observational datasets and numerical modeling, and has grown an international reputation as an expert on tropical cyclone structure, intensity, and intensity change. Dr. Corbosiero has been the PI on numerous federal research grants from the NSF, NASA, and NOAA. Because tropical cyclones are among the costliest natural disasters in terms of life and property, and in recognition of her ability to communicate scientific concepts to the public, she is frequently interviewed by the AP and Scientific American, among other print and online media, and has appeared on the CBS Evening News and MSNBC.

Bobby Saba

PhD Student – OU/CIWRO/NSSL

Bobby is a PhD student at the University of Oklahoma studying severe convective storms with the Cooperative Institute for Severe and High-Impact Weather Research and Operations and the National Severe Storms Laboratory. His interests are in anything severe storms, but his experience includes observations, instrumentation, and high-resolution simulations. Bobby graduated with his B.S. in Atmospheric Sciences from (then) Northern Vermont University - Lyndon in 2022 and his M.S. in Meteorology from OU in 2024. Outside of his research, Bobby loves teaching, listening to music, and golfing with friends!

Workshop Presenters

Nick Gregory

WNYW-TV Fox 5 Television – New York City

Nick Gregory joined FOX 5 in December 1986 and brings viewers the weather on FOX 5 News at 5, 6 and 10 p.m. Before joining FOX 5 News, Gregory served as the morning meteorologist for CNN in Atlanta, Georgia. Prior to CNN, he served as a meteorologist for WTLV-Channel 12 (ABC) in Jacksonville, Florida.

Gregory has been honored with several awards over the course of his career. He has been on the American Meteorologist Society's "Board of Broadcast Meteorology" and was Chairman of the Board in 1992. He has received the AMS Seal of Approval for Excellence in Television Weathercasting and both the "New York Post" and the "Daily News" have named him the most accurate weather forecaster in New York City.

He participates in many charities and is also very involved in the community visiting schools all across the tri-state area. In recognition of this, Gregory has been awarded the New York City Comptroller's Award for outstanding community service. A 1982 graduate of Lyndon State College in Lyndonville, Vermont, Gregory holds a bachelor's degree in meteorology.

He has been a licensed pilot for 42 years and has been a flight instructor for over 30 years. More recently he became an FAA Designated Pilot Examiner conducting flight tests on behalf of the FAA. With his aviation background, Nick is the FOX 5 News expert on any aviation story. He also flies missions for Angel Flight, a non-profit organization that provides free transportation for financially needy patients and families to and from their medical treatments.

Gregory is married, has three children, and resides in the New York area.

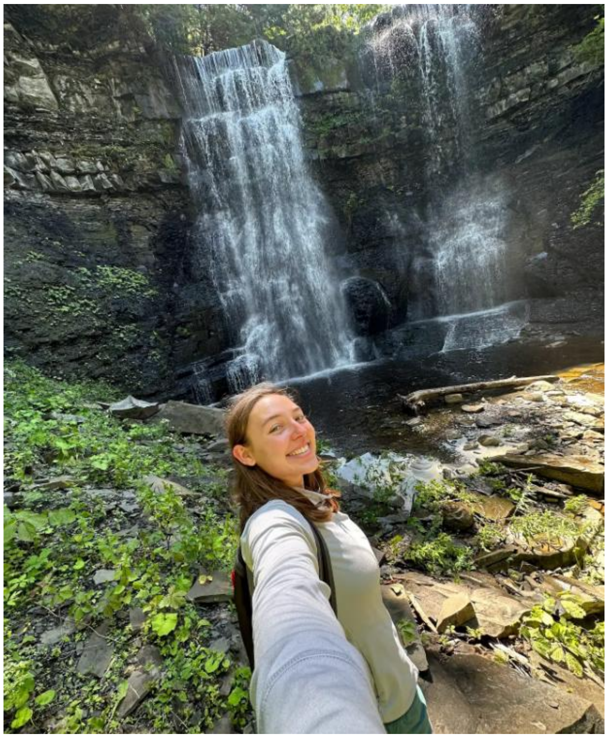
Amanda Curran

WSFA 12 News – Montgomery, Alabama

Amanda Curran joined WSFA 12 News in July 2014 as a Meteorologist. Before moving to the Heart of Dixie, Amanda grew up in New Hampshire and spent four years in Vermont; there she graduated with her bachelor's degree in Atmospheric Sciences and her associate's degree in Television Studies from Vermont State University, formerly known as Lyndon State College.

In her decade long career as a broadcast meteorologist, Amanda has had plenty of opportunity to cover it all! From snowstorms in the south to multiple rounds of severe weather (sometimes all within a couple of weeks), Alabama weather has continued to keep Amanda on her toes. Her work on air and in the field has been recognized by the Alabama Broadcaster's Association and Associated Press, along with the Southeast Regional Emmys and Edward R. Murrow organizations. In 2017 Amanda earned the American Meteorological Society's Certified Broadcast Meteorologist (CBM) designation, a professional recognition of the quality of her weather broadcasts.

On top of her weather duties, Amanda loves the opportunity to go out into the community and meet new people. In her free time Amanda enjoys running, watching football and baseball (go Patriots/BoSox!) and spending time outside with her shelter dog, Tanner.



Kayla Lewis

NYS Teachers – Earth & Space Science

My name is Kayla Lewis, I received my BS in Meteorology from SUNY Oswego in May of 2023. During my senior year at Oswego I realized that I did not want to pursue a career in just meteorology. I always enjoyed talking about science with others, especially kids. I then decided to continue my education at The University at Albany to pursue my Masters of Secondary Science Education with a focus on Earth Science. While teaching Earth and Space Science full time at a small school north of Troy, NY I am also working with the State Weather Risk Communication Center on creating a weather course for DOT, EM, and DHSES personnel. Being able to share my love for science, especially the weather with others has been so rewarding. Watching my students get excited about science is the best part of teaching in my opinion. Many of them were excited to show me their northern light pictures from the event on October 10th 2024. Teaching has had its ups and downs but I have loved every day of it.

Gabrielle Brown

Master's Student – University of Oklahoma

Gabrielle "Gabby" Brown is a second-year Master's student in the School of Meteorology at the University of Oklahoma. She earned her Bachelor's degree in atmospheric sciences from Northern Vermont University - Lyndon in 2023. For her thesis, Gabby is developing a framework to examine sources of predictability for extreme events on subseasonal timescales, with a focus on regions including Pakistan and Peru. In alignment with this work, she collaborates with an interdisciplinary team working to understand weather and climate challenges and needs in vulnerable Latin American countries and inform decision-making around climate security. Gabby is actively involved in the AMS, serving as a co-chair in training on the AMS Student Conference Planning Committee. She is also the President of The Climate Consensus, a 501(c)(3) non-profit organization dedicated to making climate science accessible to the public by empowering students and professionals in climate and climate-related fields to engage in outreach and communication.

Oral Presentation Abstract

March 15th, 2025

Governor AB

9:15 AM – 9:30 AM

The Met Instruments Project: A Low-Cost, High Accuracy Weather Station Network

Quinton Kirsch

Met Instruments Project

Surface observations are an integral part of weather reporting and prediction. While pre-existing networks such as FAA/DOD ASOS or state funded mesonets transmit high-quality data at acceptable temporal resolution (5 min typical), the cost to own and operate one or an entire network of these sites is prohibitively expensive. A typical site will cost upwards of $50,000 to $100,000. Given these barriers of entry, I began the Met Instruments Project in July of 2023. This project is an innovative initiative exploring affordable high-quality meteorological observations through the development of a low-cost research grade automated weather station architecture. This project leverages Arduino microcontrollers and repurposed data loggers and instrumentation to collect and transmit data to the internet. Each site records standard meteorological measurements including but not limited to wind, temperature, relative humidity, pressure, and rainfall. These measurements comply with WMO and AASC standards as close as practical. Data is transmitted to an SQL database which is queried for data processing and display. Data visualization is done so through interactive D3.js graphs and numeric displays showing real time and historic observations. The network design emphasizes low-cost yet robust measurement capabilities and extremely simplistic data throughput minimizing potential failure therein. An installation of this kind costs merely a fraction to that of a standard mesonet. A site utilizing this framework located in Lakeland, Florida has been in operation since April of 2024 and has observed directly and indirectly four hurricanes with no impact to performance or reporting ability. These preliminary results are promising and prove hopeful to the longevity and feasibility of this architecture. Further work will still need to be done to finalize the layout and interconnectivity of each device for successful weather data reporting at standard minutely intervals. To view data and find more information you can go to the project website www.met-instruments-project.com.

Oral Presentation Abstract

March 15th, 2025

Governor CDE

9:15 AM – 9:30 AM

An Overview of the High-Impact December 2023 East Coast Atmospheric River Event and its Predictability by Operational and WRF modeling systems

Peyton K. Capute, Jason M. Cordeira

Center for Western Weather and Water Extremes, Scripps Institution of Oceanography, University of California San Diego, La Jolla, California

Atmospheric rivers (ARs) are a well-known phenomenon that can result in orographically enhanced precipitation over the West Coast of the United States. Recent research has found that ARs are as frequent or more frequent across the Northeast U.S. compared to the Western U.S. and can result in cool-season “compound” flooding due to heavy rain, melting snow and potential ice jams. Previous studies have shown that over 30% of non-summer precipitation can be related to ARs in the Northeast U.S., including over 90% of non-summer extreme precipitation, over 85% of National Weather Service-issued flood/flash flood watches, warnings, and advisories, and 95% of ice jam and related flood events.

To better predict impacts of ARs over the West Coast, a high-resolution regional re-forecast model has been developed by the Center for Western Weather and Water Extremes (CW3E) based on the Weather Research and Forecasting (WRF) model over the western United States (West-WRF). This presentation provides an overview of the precipitation and flooding impacts of the December 2023 East Coast AR event and will compare the precipitation forecast skill of a version of the West-WRF model configured over the East Coast with several operational models for a December 2023 AR event. The study will focus on precipitation, impacts, and forecast skill over the Catskill Region of New York and the catchments for the NYC Water Supply. Preliminary results indicate that CW3E’s operational West-WRF configuration may over-forecast precipitation at higher elevations and under-forecast precipitation at lower elevations compared to operational models such as ECMWF and GFS in the region.

Oral Presentation Abstract

March 15th, 2025

Governor AB

9:30 AM – 9:45 AM

Empowering Climate Communicators: The Climate Consensus's Role in Supporting Climate Engagement and Outreach

Andrew Westgate, Gabby Brown, Austin Thomas Reed, Allison LaFleur, Gerald Falco, Janel Hanrahan, Amelia Roosevelt, Carlisle Wishard

Vermont State University – Lyndon, University of Oklahoma, George Mason University, RoVolus, LLC, The Climate Consensus, Inc., RTI International, Bedford 2030, University of New Mexico

Due to an abundance of disinformation and common misconceptions about anthropogenic climate change, the idea of engaging with the public on this topic can be daunting for many. This has escalated the need for establishing safe environments where students and scientists with similar interests and motivations can convene, converse, and practice communication skills. The Climate Consensus is a 501(c)(3) nonprofit organization that works to inspire current and upcoming scientists to engage in climate outreach and dialog. This organization began as a grassroots effort, when students, faculty, and staff from multiple colleges and universities began practicing climate change communication and engaging with the community. The scope has broadened since transitioning to a nonprofit organization in 2021. The Climate Consensus is now a nationwide network of concerned and knowledgeable students and scientists spanning multiple fields and sectors.

With a goal to inform the public on the topic of anthropogenic climate change, this organization greatly benefits from collaborations amongst people with diverse careers and perspectives. This has led to shared resources, knowledge development, and a culture of support that encourages effective communication between scientists and the public. Ongoing and past engagement efforts include social media and blog posts, school visits, workshops, and relevant campus and community tabling at events. With the ability to receive grant and philanthropic support, we strive to position this young organization to award scholarships and provide aid to start, develop, and maintain local chapters. Instilling students and scientists with the resources and confidence to connect with others about science and our future, we have an immense opportunity to shape public opinion on this topic and motivate real action. This presentation will discuss The Climate Consensus's history, vision for the future, and opportunities to get involved.

Oral Presentation Abstract

March 15th, 2025

Governor CDE

9:30 AM – 9:45 AM

Synoptic-Scale Evolution of the Extreme Precipitation Period of 4-25 February 2019 in Eastern North America

Yeechian Low, John Gyakum

McGill University

The extreme precipitation period of 4-25 February 2019 in eastern North America contributed to major flooding in the Ohio and Mississippi Valleys, a record wet winter in the contiguous United States, and unusually snowy winter in Ontario and Quebec, especially north of the St. Lawrence River. This period was characterized by an anomalously slow-moving Rossby wave pattern extending from the North Pacific to the East Coast of North America consisting of an anomalous upper-level ridge, trough, and ridge in the central North Pacific, western U.S., and eastern U.S. respectively. This pattern favored repeated cyclones with abundant Gulf of Mexico moisture to track from the central U.S. to the eastern U.S. or Canada, depositing large precipitation amounts over a large area via both synoptic and mesoscale forcings for ascent. Areas north of the storm track generally experienced strong synoptic forcing for ascent with lighter, steadier precipitation. On the other hand, areas south of the storm track generally experienced weaker synoptic forcing for ascent but stronger mesoscale forcing for ascent with heavier, more convective, and more intermittent precipitation.

Oral Presentation Abstract

March 15th, 2025

Governor AB

9:45 AM – 10:00 AM

The Triple Point: Where Weather, Climate, and Society Meet

Michael Michaud

New York State Weather Risk Communication Center

We all know that weather and climate have major impacts on society. From dangerous flooding, deadly heat, and halting winter storms, weather impacts can range from minor inconveniences to taking lives and costing billions of dollars. We have learned a great deal from the physical sciences over the last 100 years; forecasts are constantly improving, leading to greater warning times and increased confidence. But that is only one part of the equation. We must understand how society interacts with weather and climate to fully minimize their impacts.

Over the last 25 years, the AMS Board on Societal Impacts has brought together researchers, policy makers, and practitioners focused on this intersection. This presentation will introduce the Board and the integration of social, behavioral, and economic sciences (SBES) within the weather enterprise. Through a discussion about the different disciplines and the way society can be studied, we will explore examples of how SBES research has informed better ways to communicate about, prepare for, and mitigate weather and climate impacts. Additional examples will show how this work is translated into everyday operational meteorology. We will conclude with resources for those who are interested in learning more about this small and growing community.

Oral Presentation Abstract

March 15th, 2025

Governor CDE

9:45 AM – 10:00 AM

Developing a Framework for Evaluating Sources of Predictability for Extreme Events on Subseasonal Timescales in Southeast Asia & Latin America

Gabrielle Brown, Kathy Pegion

University of Oklahoma

Rising temperatures due to climate change are leading to an increase in extreme weather events, posing significant risks to vulnerable regions worldwide. These areas are already experiencing heightened incidences including extreme precipitation, droughts, and floods, which threaten climate security and endanger lives and property. Immediate preparation and adaptation efforts are crucial to mitigate these risks. Subseasonal prediction can provide more timely information for effective climate adaptation strategies. Developing a framework for analyzing these events and their predictability is essential to improving subseasonal predictions of extreme weather, thereby reducing risks to impacted regions.

In this work, recent extreme weather events are analyzed, including the extreme precipitation that caused extensive flooding in Pakistan during the summer of 2022. Using ECMWF Reanalysis v5 (ERA5) and observational datasets, such as Climate Hazards Group InfraRed Precipitation with Station (CHIRPS) data, potential drivers and mechanisms behind these events are examined. NCAR Community Earth System Model (CESM) skill is used to understand how far in advance useful information could have been provided to impacted countries. Further, a unique set of initialized prediction experiments from NCAR CESM with climatological initial conditions for different combinations of earth system components (e.g., land, ocean, and atmosphere) are used to identify which components contribute most to the occurrence and prediction of these events. Lastly, analysis of the causes of these events will be presented. This methodology is utilized on recent extreme weather events in Southeast Asia and Latin America to assess its use in different geographic locations. This process and analysis will lead to understanding sources of predictability for extreme weather in these countries.

Oral Presentation Abstract

March 15th, 2025

Governor AB

10:15 AM – 10:30 AM

Lightning and Vortex Overview of the 18-19 Nov 2022 Storm during the Lake-Effect Electrification (LEE) Project

Kaitlin Farrell, Dr. Scott Steiger, Dr. Yonggang Wang

SUNY Oswego

The Lake-Effect Electrification (LEE) Project was a scientific field campaign conducted from November 2022 to March 2023, focusing on the role of electrification during multiple snowstorm events. The goal of the LEE project is to better understand how electrification forms in snow storms and investigate whether nearby wind turbine farms influence storm-related electrification and lightning. Conducting this field project has been very important since there is little knowledge or understanding of how thundersnow is produced in this storm type. The project captured multiple thundersnow events from various locations and systems (e.g., a lightning mapping array).

One notable event occurred on 18 November 2022, from 0800 UTC to 1600 UTC (referred to as "Event 2" by project scientists as this was not an intensive observation period when all LEE major facilities were deployed such as the Doppler on Wheels radar). The majority of the 31 lightning flashes occurred between 0800 UTC and 1000 UTC. The flashes consisted of cloud-to-ground lightning, positive and negative flash leaders, intracloud flashes, and bi-level flashes. All of these observations will be analyzed and explained in detail. Multiple different bi-level and changed leader flashes, negative to positive or positive to negative, occurred throughout this period, with the most lightning occurring around 0900 UTC, when the storm exhibited the greatest radar reflectivity as observed by the nearby WSR-88D radar (KTYX).

Oral Presentation Abstract

March 15th, 2025

Governor CDE

10:15 AM – 10:30 AM

The Influence of Complex Terrain on the Turin, New York Tornado of 2023

Alex Kramer, Brian Rose, Ross Lazear

University at Albany, SUNY

Although much less common than in the Great Plains, significant EF2+ tornadoes have impacted the Northeast United States. As the Northeast has significant topography, tornadoes in this region often encounter complex terrain which can affect both structure and intensity. This study investigates the role terrain played on the recent EF3 tornado that impacted the Tug Hill Plateau region of Central New York and the town of Turin in 2023. This tornado encountered a significant elevation gain as it ascended the Tug Hill Plateau, then traversed a significant drop in elevation as it descended into the adjacent river valley, impacting the town of Turin. As it descended it began producing EF3 level damage and a marked increase in tornado vortex signature (TVS) was observed on radar. Weather and Research Forecasting (WRF) model simulations with modified terrain were used to determine the impacts of terrain on the tornado. It was tested whether descending terrain increases local tornadic and mesocyclone vorticity through stretching and narrowing and vice versa for ascending terrain, as well as whether valley channeling of low-level flow locally increased tornadic vorticity through an increase in low level helicity.

Oral Presentation Abstract

March 15th, 2025

Governor AB

10:30 AM – 10:45 AM

A Time Series Analysis of Rain on Snow Events on the Summit of Mt. Washington

Charles Peachey, Laura Wilson, Amy Cotter

Mount Washington Observatory, Dartmouth University

This study investigates the characteristics of rain-on-snow (ROS) events on the summit of Mount Washington, New Hampshire, using data from the daily weather observations taken at the Mount Washington Observatory from 1981 to 2020 to create two different climatologies (1981-2010 and 1991-2020). Several metrics were used to evaluate ROS events, including the frequency and duration of ROS events, the total amount of precipitation during the events, and their impact on snowpack stability and the surrounding watershed. Based on these metrics, several statistically significant ($p < 0.05$) trends were found in the data set, and a case study was then performed to investigate the characteristics of a ROS event that occurred on December 18-19, 2023, which resulted in record flooding across the majority of Northern New England. Notably, a positive increase in ROS events was found for both climatologies, but the highest increase happened in the most recent two climatologies. Furthermore, the decadal trends showed that the most recent decade (2011-2020) shifted the maximum number of ROS events from November to December relative to the other three decades (1981-2010), indicating a shortening winter season and weakening snowpack. Additionally, the December 2023 event case study showed how the snowpack characteristics at the beginning of the winter season can significantly contribute to the flooding associated with ROS events, particularly one that produced an 800-year flood.

Oral Presentation Abstract

March 15th, 2025

Governor CDE

10:30 AM – 10:45 AM

A Multi-scale Analysis of the 16 July 2024 Significant Severe and Tornadic Event across New York and New England

Thomas A. Wasula

NOAA/National Weather Service, Albany, New York

On 16 July 2024, a widespread severe weather event occurred across much of upstate New York (NY) and portions of New England. A Mesoscale Convective Vortex (MCV) produced widespread wind damage and eleven tornadoes across central and eastern NY into New England. Ten tornadoes occurred in NY, which is an anomalously high amount, as about nine tornadoes occur annually in NY based on climatology data from 1980 to October 2024. Over 200 severe reports were recorded with the majority being damaging winds of 50 knots (58 mph) or greater, and a few large hail reports (1.9 cm in diameter or larger). Damage surveys classified microbursts near Lake George and Stewart Creek in Warren County, NY and Rupert in southern Vermont, with estimated winds of 70 knots (80 mph) to 78 knots (90 mph). The widespread wind damage included numerous downed trees, several homes with roof damage, and some collapsed structures. The NY State Mesonet sites in Edinburg (Saratoga County) and Glens Falls (Warren County) recorded gusts of 63 knots (73 mph) and 76 knots (87 mph), respectively.

This presentation is a multi-scale analysis from the meso-alpha to meso-gamma scale of this major severe weather event. An MCV approached upstate NY and New England from southeast Ontario in the late morning. The air mass became moderately unstable ahead of the MCV, with mixed-layer CAPE of 1000-2000 J kg-1 and effective bulk shear of 35-50 knots based on the HRRR analysis. The 0-3 km storm-relative helicity values increased to 150-250 m2s-2 across central and eastern NY, as an MCS formed with embedded meso-vortices and supercells between 1800 and 2300 UTC with the tornado threat enhanced. Multi-radar-multi-sensor (MRMS) Low-Level Azimuthal Shear (0-2 km AGL) and Rotation Tracks were > 0.015 s-1 in a majority of the tornadoes within and near the Adirondack Park. The meso-gamma scale analysis will focus on helpful warning techniques, including applying results from local rotational velocity (Vr)-shear and normalized rotation (Nrot) studies to improve the tornado warning process. Finally, this presentation will briefly discuss a few applications of recent warm-season severe Collaborative Science Technology and Applied Research (CSTAR) results to this high impact event.

Oral Presentation Abstract

March 15th, 2025

Governor AB

10:45 AM – 11:00 AM

Evaluation of Planetary Boundary Layer Schemes during the Lake-Effect Electrification (LEE) Project 18-19 November 2022 Event Using the Weather Research and Forecasting – ELEC Model

Thomas White, Yonggang Wang, Scott Steiger

Department of Atmospheric and Geological Sciences, SUNY Oswego

Lake-effect storms can be challenging to forecast and can quickly produce hazardous conditions over densely populated areas (e.g., Buffalo, NY blizzard disaster Christmas 2022). Lightning is associated with the most intense lake-effect storms, particularly downwind of the Great Lakes of Erie and Ontario. This study utilizes the Weather Research and Forecasting (WRF) model, with an extra electrification (ELEC) package, to thoroughly analyze the impressive lake-effect storm structure before and during the second intensive observation period of the Lake-Effect Electrification (LEE) project that occurred on 18-19 November 2022, east of Lake Ontario near the Tug Hill Plateau. Previous studies have shown greater planetary boundary layer (PBL) height is critical in initiating lightning in lake-effect storms.

Three model runs were conducted from 0Z 17 Nov to 12Z 19 Nov using the Yonsei University (YSU), University of Washington (UW), and Mellor-Yamada Nakanishi and Niino Level 2.5 (MYNN2) PBL schemes. The convection-permitting WRF simulations, with a 3 km horizontal resolution inner nest, were driven by ERA5 reanalysis data. Project soundings (including electric field meters) and NEXRAD data from the event were used to verify the simulated results. Additionally, the simulated electric field magnitude and flash initiation points were used to assess the location of enhanced electrification and lake-effect lightning in the precipitation band, with each flash compared to lightning mapping array (LMA) data of observed lightning. All model runs reasonably reproduced the electric field magnitude within the lake-effect bands, showing values exceeding 100 kV/m, particularly near high-reflectivity convective cells. Planetary boundary layer heights were also well represented; however, the maximum heights did not strongly correlate with flash initiation timing.

Oral Presentation Abstract

March 15th, 2025

Governor CDE

10:45 AM – 11:00 AM

Examining Right-Moving Supercell Environments with Doppler Wind LiDAR Observations

Bobby Saba, Michael C. Coniglio

University of Oklahoma, School of Meteorology, Cooperative Institute for Severe and High-Impact Weather Research and Operations, NOAA/OAR/National Severe Storms Laboratory, Norman, OK

While immense enhancements to meteorological observations and simulations have been made over the last several decades, two lingering questions continue to plague the community: (1) Why do some storms produce tornadoes while others do not, and (2) why do storms in seemingly identical environments go on to produce different hazards? Developing robust answers to these questions are critical as tornadoes continue to be a top cause for weather-related fatalities. Storm environment research through simulated storms, reanalysis products, and limited observations have guided the current understanding and have identified differences between environments supportive of tornadic and non-tornadic supercells. This work aims to use more detailed observations through doppler wind lidars to capture the storm environment evolution in both time and space.

Since 2016, the National Severe Storms Laboratory has operated mobile scanning doppler wind lidars within the inflow of supercell thunderstorms as part of collaborative field projects (mini-MPEX, TORUS, PERiLS, TORUS-LiTE, and LIFT). The research goal of this instrument is to observe the evolution of storm inflow properties to gain a better understanding of the storm environment surrounding an evolving supercell. Various scanning and post-processing techniques to capture the wind profile evolution via DWL observations have been used. Prior to 2022, a velocity azimuth display technique was used to retrieve a vertical wind profile every 3-5 minutes using 8 points 20 degrees off zenith. In 2022-23, a continuous scanning mode was implemented to retrieve wind profiles as frequent as every 5 seconds. Both of these scanning strategies yielded vertical profiles of derived horizontal winds about every 18 meters with the first usable data point around 75 meters AGL after filtering based on a signal-to-noise ratio threshold. A new optimal estimation technique was designed to incorporate co-located rawinsonde and surface observations into the wind retrievals that provide data between the surface and 75 meters. These observations are used to validate the post processing techniques and output will be compared to previously used methods.

Focus will be placed on the evolution of the near-ground kinematic characteristics and the storm induced environmental modification in both tornadic and non-tornadic storms. To remove background trends from the environmental evolution, Rapid Refresh model-based analysis profiles are used. Full, surface-based wind profiles will allow for the quantification and time evolution of severe weather forecasting parameters, such as storm-relative helicity, storm-relative winds, etc. Implications of these results on recent studies discussing the relative importance of streamwise vorticity versus storm-relative winds on supercell properties and tornado production will be discussed. Results will provide an unprecedented look at the near-ground kinematic properties of supercell inflow environments to help validate storm-environment relationships traditionally derived from rawinsonde observations or model analysis profiles.

Oral Presentation Abstract

March 15th, 2025

Governor AB

11:00 AM – 11:15 AM

A Review of the 23 March 2024 Northeast Winter Storm

Jon Palmer

National Weather Service, Weather Forecast Office - Gray, Maine

The winter storm of March 23rd, 2024 brought significant snowfall to interior New Hampshire and Maine, as well as substantial sleet and freezing rain along the coast. The storm resulted in prolonged power outages affecting nearly 200,000 people in southern New Hampshire and coastal Maine. At the Portland Jetport, 0.72 inches of freezing rain were recorded, with ice accumulations likely exceeding one inch in nearby locations across the Midcoast. Reliable reports during the event were scarce, as the majority of the ice accumulation occurred very late at night.

This case study analyzes the storm, evaluating model performance, the accuracy of NWS Gray's ice and snow forecasts, and the messaging that led up to the event. It also investigates potential areas for improvement in precipitation-type forecasting and communication strategies.

Oral Presentation Abstract

March 15th, 2025

Governor CDE

11:00 AM – 11:15 AM

Do "Immense" Supercell Updrafts Indicate Imminent Tornado Formation?

Michael M. French, Darrel M. Kingfield

Stony Brook University, Stony Brook, NY, NOAA/Global Systems Laboratory, Boulder, CO

Since 2017, there has been a focus in the literature on the possible influence that storm updraft size may have on peak tornado intensity. Results based on theory, modeling, and observations all indicate that larger supercell updrafts are predictive of stronger tornadoes. The bases for such a connection are conservation of angular momentum and scaling arguments for key supercell features: a storm with a wide updraft would tend to have a wide downdraft, etc. ending with a wide tornado. From there, wider tornadoes, generally, are assumed to be more intense than narrower tornadoes. While the observational connection between updraft size and tornado intensity has been demonstrated in several studies using different methods to estimate updraft size, there are substantial disagreements in the literature as to the validity of the hypothesized dynamical connection.

The proposed link between larger updrafts and tornado intensity does not formally apply to tornado formation. There is no theoretical/modeling link between large supercell updrafts and a high probability of tornado formation. However, in our 2021 study, we found preliminary evidence that showed exactly such a connection. We developed a novel algorithm to identify and quantify the areas of ZDR columns, a polarimetric radar signature that acts as a proxy for a storm updraft, and we used the area output as a crude estimate for updraft size. Tornadic supercells had larger ZDR column areas in the minutes before tornadogenesis than those from non-tornadic supercells at the time of their peak low-level rotation. One way to think about the 2021 results is that the non-tornadic cases displayed a distinct lack of the largest ZDR column areas; we refer to supercells with ZDR column areas ≥ 40 km2 as having "immense" updrafts. In multiple radar volumes from ~45 non-tornadic cases studied, there were zero immense updrafts present, while there were ~75 immense updrafts in the ~300 radar volumes studied for tornadic cases. However, the sample of non-tornadic radar volumes studied was quite small, and much stronger evidence would be needed to claim that immense updrafts can predict tornado formation.

In this study, we aim to address more thoroughly the possible connection between immense supercell updrafts and tornadogenesis. We analyze a much larger set of non-tornadic radar volumes (~500) from the WSR-88D network archive to gain a better estimate of the true relative frequency of immense supercell updrafts within non-tornadic supercells. In turn, we can determine whether immense updrafts may be considered as a future skillful predictor of imminent tornadogenesis in operational nowcasting of tornadoes. We also discuss the practical limitations of real-time algorithm use in a warning environment.

Oral Presentation Abstract

March 15th, 2025

Governor AB

2:15 PM – 2:30 PM

GYX HeatRisk Examination

Ethan Mousseau, Justin Arnott

Plymouth State University, National Weather Service Gray, ME

This study considers HeatRisk, an experimental color-numeric based index developed by the National Weather Service in coordination with the CDC. The purpose of this study was to investigate HeatRisk at all sites in the GYX CWA from 2014-23 and compare it to actual heat headlines that were issued. Annual statistics were tabulated on the difference in HeatRisk days and actual products issued by location for both orange and red HeatRisk days. It was found that according to HeatRisk criteria, the entirety of the GYX CWA is underwarned, particularly in northern locations. However, using HeatRisk as the baseline criteria would lead to a significant increase in heat headlines, causing overwarning across the CWA. Case studies from Summer 2024 heat waves across the CWA were also looked at and compared with HeatRisk days. Additionally, hospitalizations due to heat illness were included from the CDC to show the cumulative effect of heat waves along with acclimation to them through the summer. It was found that using HeatRisk as the criteria for heat headlines is not currently plausible. It remains a possibility that HeatRisk could be modified to become more usable for issuing heat headlines. However, there are many factors involved regarding the impacts of heat across the CWA that should be further investigated.

Oral Presentation Abstract

March 15th, 2025

Governor CDE

2:15 PM – 2:30 PM

Navigating Towards a Greener Future: The Maritime Industry's Evolution in Combating Climate Change

Allison Fitzpatrick

StormGeo

The maritime industry is undergoing a significant transformation in response to the growing challenge of climate change. Nearly 90% of the world's trade is transported by sea, accounting for approximately 3% of global greenhouse gas (GHG) emissions from ships. The maritime sector is under increasing regulatory and market pressure to reduce its environmental impact.

Over the last 20 years, regulations have increased to help reduce GHG emissions with stricter standards slated scheduled to take effect in the future. In response, the maritime industry has started building vessels to run on alternative fuel sources, as well as upgrading their fleets to utilize other decarbonization technologies. Many European countries are phasing in a cap-and-trade carbon credit system to incentivize companies to reduce their carbon footprints. By integrating weather routing strategies, technological advancements, and regulatory compliance, the maritime industry is charting a course toward a more sustainable future.

This talk will explore how meteorology is taking on these challenges and assisting the maritime community with navigating the evolving landscape of maritime regulations.

Oral Presentation Abstract

March 15th, 2025

Governor AB

2:30 PM – 2:45 PM

Hidden Dangers: Investigating Thin Ice and Cold Water Boating Incidents across Vermont and Northern New York, 1990-2023

Dakota Wiley, Peter C. Banacos

Vermont State University – Lyndon, NOAA/National Weather Service, Burlington, Vermont

Cool season recreational activities on bodies of water across Vermont and northern New York can pose significant hazards. Tragically, individuals have been injured or lost their lives by falling through thin ice or capsizing small boats into cold water, leading to drowning. Despite the public safety risks, no comprehensive database previously existed to track and analyze such incidents. This project aimed to quantify and analyze these incidents. Data were gathered through a detailed and careful review of 20 local newspaper archives from Vermont and northern New York for the period 1990-2023.

A total of 40 thin ice-related incidents were identified, involving 85 individuals (58 rescues and 27 drownings). Additionally, 19 cold-water boating incidents were documented, affecting 43 individuals (19 rescues and 24 drownings). An anonymous database was created to log each incident, including details such as location, date, time, age and sex of those involved, incident type (rescue or drowning), activity being performed at the time (e.g., ice fishing, kayaking), and life jacket usage. Air and water temperature data were also incorporated for each incident, derived from available meteorological and hydrological datasets. Additional pertinent information from each news story was included in a "notes" section, allowing for a qualitative component to the analysis. To enhance accessibility and visualization, a GIS dashboard was developed to map the metadata and reveal spatial patterns. This tool offers operational forecasters valuable insights into the distribution of these events.

This presentation will highlight recurring themes in thin ice and cold-water boating incidents, with an emphasis on their connection to environmental factors such as winter thaw cycles and springtime cold water boating incidents coinciding with unseasonably warm, sunny weather. The aim of these findings is to guide targeted public messaging strategies by NWS Burlington to mitigate future incidents. Examples include broadcasting relevant Public Information Statements via NOAA Weather Radio, updating NWS webpages, and issuing graphics and messaging on social media platforms during periods of heightened risk.

Oral Presentation Abstract

March 15th, 2025

Governor CDE

2:30 PM – 2:45 PM

Stationary Fronts across North America

Neil Laird, Ryan Gale, Caitlin Crossett

Hobart and William Smith Colleges, Univ. of Montana, Univ. of North Carolina - Asheville

Stationary Fronts are a common weather phenomenon that forms as a transition zone between two air masses of differing density. Previous research has identified stationary fronts as locations connected to heavy precipitation and hazardous weather, typically in the warm season months. In order to understand the possible association of hazardous weather with stationary fronts during all months, it is important to have comprehensive knowledge of the spatiotemporal variation of stationary fronts. This study used the archived NOAA Weather Prediction Center North American surface analysis and coded surface bulletin to investigate the frequency and spatial distribution of stationary fronts over North America and adjacent oceanic regions for the 20 years spanning 2004 – 2023. There is a considerable seasonal variation in number and location of stationary fronts between cold and warm seasons. During the cold season, stationary fronts are commonly located along the Gulf of Alaska coastline and eastern front range of the Rocky Mountains. Stationary fronts become more common across northern Alaska and the central and eastern regions of Canada and the United States, as well as the eastern coastline of the United States, during the warm season.

Oral Presentation Abstract

March 15th, 2025

Governor AB

2:45 PM – 3:00 PM

Enhancing Weather Risk Communication Strategies: The New York State Weather Risk Communication Center

Katie Bachli, Michael Michaud, Allison Finch

State Weather Risk Communication Center

New York State, the 4th-most densely populated state in the country, is a "kitchen sink" when it comes to disruptive weather phenomena. Some of New York's primary weather risks include tornadoes, hurricanes, lake effect snow, wildfires, and extreme rainfall. Due to this large spectrum of weather hazards, New Yorkers have an increased susceptibility to a wide variety of weather-related impacts. The combination of New York's dense population and diverse assortment of meteorological risks presents a unique challenge to state officials, whose job it is to protect New Yorkers' lives and property. To help address this challenge, five National Weather Service (NWS) offices work in conjunction to provide vital weather information for the state. While NWS forecast accuracy has improved significantly through the decades, multiple weather-related fatalities still occur across New York each year. Recognition is growing among the meteorology community that fatalities may be more attributed to communication methods rather than forecast accuracy. The mission of the New York State Weather Risk Communication Center (SWRCC) is to take forecasts produced by federal meteorologists and translate them into a more digestible and actionable format for state officials. This includes leveraging written, visual, and verbal communication methods to enhance the clarity, impact, and depth of weather forecasts. By condensing information from multiple sources into a single, comprehensive briefing, the SWRCC helps emergency managers make informed decisions that will protect New York State communities. This presentation will provide a comprehensive overview of the SWRCC's daily operations, members, partnerships, projects, and future goals.

Oral Presentation Abstract

March 15th, 2025

Governor CDE

2:45 PM – 3:00 PM

The Saint-Lawrence River Valley Front: A Synoptic-Dynamic Climatology

Juliann Wray, John Gyakum

McGill University

The Saint Lawrence River Valley (SLRV) front is a key factor influencing the weather of southern Quebec, southeastern Ontario, and portions of northern Vermont and New York. The primary objective of this study is to analyze SLRV frontal processes. An extreme example of this front, and the way that the orographic wind channeling along the SLRV impacted local weather, is the January 1998 ice storm, as well as the more recent April 2023 ice storm. A better understanding of the SLRV front would allow for improved forecasting in the SLRV region, which would enable stakeholders to make more informed decisions regarding local hazardous weather. Despite the important influence of the SLRV front on our local weather, it is not well defined in the refereed literature. The primary objectives of this study are thus to rigorously define the SLRV front and identify the large-scale (synoptic) environments facilitating its formation and maintenance. Winter-time SLRV frontal events from 1940 through 2024 are identified and examined through an assessment of Petterssen frontogenesis within the SLRV region. These 102 events are then synoptically typed into six distinct categories using self-organizing maps, and the synoptic scale characteristics are examined. This project synthesizes meteorological metrics such as temperature, wind, and pressure from conventional weather-station data, higher spatio-temporal resolution research field experiments, and numerical-model reanalyses. A thorough investigation of the SLRV front is important to quite literally put the SLRV front on the map.

Oral Presentation Abstract

March 16th, 2025

Governor AB

11:15 AM – 11:30 AM

Multi-Scale Analysis of a Flash Freeze Event

Maria Paquin, Juliann Wray, Quinn Dyer-Hawes, Djordje Romanic, John Gyakum

McGill University

Environment and Climate Change Canada issues a flash freeze warning “when significant ice is expected to form on roads, sidewalks or other surfaces over much of a region because of the freezing of residual water from either melted snow, or falling/fallen rain due to a rapid drop in temperatures" (ECCC 2024). A high-impact flash freeze event is analyzed from synoptic scale, mesoscale, and microscale perspectives. The 28–29 February 2024 cold front produced rapidly decreasing temperatures, and gusty winds that primarily impacted regions from the Great Lakes eastward to Quebec and portions of northern New England. A dynamical distinction between synoptic scale and mesoscale features in the Great Lakes and Saint Lawrence River Valley region is examined. This event presents a remarkable example of an idealized cold frontal profile through upper-air data, coincident with first order temperature discontinuities at the surface, as well as pre- to post-frontal wind shifts. A Doppler lidar wind profiler is used to measure the time evolution of the wind field as the cold front passes over Montreal. Analysis of properties such as gust factor and turbulence intensity show the intense winds that can often be associated with flash freeze events. Lidar measurements are also combined and compared with local upper-air data to investigate evolving atmospheric stability during the event, to provide insight on the dynamic and thermodynamic structure of a flash freeze event.

Oral Presentation Abstract

March 16th, 2025

Governor CDE

11:15 AM – 11:30 AM

Cropland Change in the Mississippi Delta: Panacea or Peril Amidst a Worsening Climate?

Brett Violett, Dr. Yen Heng Lin, Dr. Boniface Fosu, Dr. Jamie Dyer, Dr. Shrindhi Ambinakudige, Dr. Brian Williams, Dr. Dean Hardy, Dr. Destiny Crockett, Dr. Monica Barra

Mississippi State University, University of South Carolina

The Mississippi Delta, a key agricultural region in Western Mississippi, is an essential economic driver for the state. Past decades have seen the size and concentration of that cropland fluctuate within the MS Delta. Such variations from previous land use is expected to have significant long-term implications on local climate variability and change. However, the impact of cropland change on regional climate dynamics are not yet fully understood and remain unexplored. Using the University of Maryland's Land-Use Harmonization data (LUH2), USGS Land Use and Land Cover (LULC) and MODIS Land Cover datasets, this study assesses the effects of cropland change on thermal characteristics and surface fluxes in the MS Delta. The research will particularly focus on how agricultural practices, such as irrigation, influence variations in latent and sensible heat flux, which are key drivers of storm formation, heatwaves, and droughts in the region.

Oral Presentation Abstract

March 16th, 2025

Governor AB

11:30 AM – 11:45 AM

The Lake-Effect Electrification (LEE) Project: Differences in Lightning Flash Characteristics During the 17-20 November 2022 Event

Bee Lamsma, Scott Steiger, Yonggong Wang, Eric Bruning, Stephanie Weiss, Vanna Chmielewski

SUNY Oswego, Texas Tech, NSSL

The Lake-Effect Electrification (LEE) Project was conducted from September 2022 until March 2023 with the goal of understanding the electrical charge structure of cool season lake-effect storms east of Lake Ontario and the associated lightning. During the 17-20 Nov 2022 storm, 148 lightning flashes were observed by the combined National Severe Storms Laboratory and Georgia Tech Research Institute lightning mapping array (LMA) network. These flashes were sorted into three categories based on where they were located: on the Canadian side of Lake Ontario, within 15 km of the NY lake shore, and farther than 15 km of the shore. Based on those criteria we documented 12 Canadian flashes, 25 near-shore NY flashes, and 109 inland flashes during the event. Two flashes were not diagnosed as they were near the 15 km border. The Canadian flashes will be studied at a later time as they were farther from the LMA network.

Specific characteristics analyzed included the predominant leader polarity for each flash, the LMA source mode altitude, the direction of lightning propagation in relation to the lake-effect band, and whether or not the flash propagated along a region with greater radar reflectivity. These characteristics all tell different stories about the atmospheric conditions at the time and can be compared through different storms. Notable findings included that 73% of inland flashes were composed of predominantly positive leaders (traveling into a negative charge region), ascertained through the leader's velocities relative to flash initiation, while 48% of shore flashes were predominantly negative leaders (traveling into a positive charge region). Twenty percent of inland flashes and 22% of shore flashes evenly demonstrated both positive and negative leaders within one flash. The most common altitude for LMA sources was 1.9 km MSL inland and 2.5 km MSL near shore. It was also observed that 83% of inland flashes and 89% of shore flashes tended to reside within the greater reflectivity. A majority of the inland flashes were recorded above a wind turbine field and the near-shore flashes were either over the lake or above towers close to the lake suggesting a strong correlation between the two factors.

Oral Presentation Abstract

March 16th, 2025

Governor CDE

11:30 AM – 11:45 AM

Development of Arctic zonal classification products: An ArcPy framework for analyzing 30 years of ECMWF reanalysis data to identify prevailing meteorological conditions.

Evan Barrett, Brendon Hoch, Rosa Affleck, Michelle Michaels

Cold Regions Research and Engineering Lab, Oak Ridge Institute for Science and Education

Environmental parameters for operational planning in extreme conditions require accurate knowledge of prevailing meteorological conditions. However, the Arctic region presents unique challenges due to limited observational data and unique geographical conditions. To address the need for such knowledge, this study presents an analysis of Arctic prevailing-conditions using ECMWF Reanalysis v5 (ERA5) Data from 1991-2020. A custom Python-based framework was developed to process and analyze hourly datasets, identifying zones of extreme events and their frequency across multiple temporal scales. The framework uses ArcPy to automate the generation of nearly 40,000 mapped classifications for land masses 60°N and above. This automated pipeline enables both static and dynamic map generation capabilities for operational planning now and in the future. The resulting dataset provides critical spatial and temporal resolution of Arctic prevailing-conditions, enabling more refined characterization of extreme prevailing-conditions across the circumpolar region.

Oral Presentation Abstract

March 16th, 2025

Governor AB

11:45 AM – 12:00 PM

Thermodynamic Factors Influencing a Heavy Mixed Precipitation Band within an Extratropical Cyclone

Kaitlyn R. Jesmonth, Stephen W. Nesbitt, Robert M. Rauber, McKenzie Peters, Claire Pettersen, Lynn A. McMurdie

University of Illinois Urbana-Champaign, University of Michigan, University of Washington

Mesoscale snowbands within extratropical cyclones cause major societal disruptions in the Northeast U.S. and are challenging to predict. Previous literature has suggested the importance of mid-level frontogenesis in primary snowband development northwest of the surface low. However, little is known about the coupled microphysical and thermodynamic processes within these primary snowbands. In this study we examine the 16–17 January 2022 winter storm, where a frontogenetical circulation interacted with a near-freezing thermodynamic profile to support a heavy mixed precipitation band over western NY. Microphysical observations for this case were obtained from the University of Illinois System for Characterizing and Measuring Precipitation (SCAMP), a multi-sensor suite of instruments deployed in Buffalo, NY. Data from the NOAA P-3 aircraft during the NASA Investigation of Microphysics and Precipitation for Atlantic Coast-Threatening Snowstorms (IMPACTS) field project also helped identify precipitation characteristics. To further investigate the thermodynamic factors influencing the mixed precipitation band, output from a Weather Research and Forecasting (WRF) model simulation with 1-km grid spacing was analyzed.

Cross-sectional analysis from the WRF simulation through banded precipitation reveals strong mid-level frontogenesis above persistent low-level sinking. This low-level sinking preceded the development of a low-level above freezing layer, which moved northwest toward the SCAMP site in Buffalo, NY. As this above freezing layer developed, particle size and fall speed distributions from the SCAMP depicted melting snow as the predominant precipitation type. Preliminary results show the low-level sinking and above freezing layer likely contributed to snow particle melting, aggregation, and consequently, the intense snowfall rates observed during this storm. The above freezing layer became superimposed with a frontogenetical circulation, which translated northwest toward Buffalo, NY, orographic gravity waves and strong shear-induced turbulence atop a low-level stable layer. Ongoing research is examining the relative contributions of these processes to the observed mixed precipitation band formation and evolution.

Oral Presentation Abstract

March 16th, 2025

Governor CDE

11:45 AM – 12:00 PM

Connections of Cold-season Northern Hemisphere Extratropical Cyclone Characteristics to Common Climate Modes during 1950-2023

Matthew S. Lynne, Aiguo Dai

University at Albany, State University of New York

Much effort has been dedicated to analyzing the relationship between extratropical cyclone (ETC) characteristics and common climate modes. However, uncertainties remain regarding the connection between the climate modes and inherently noisy ETC characteristics across interannual and decadal scales. Here, we perform correlative and composite analyses to reveal potential impacts of the Pacific-North American pattern (PNA), El Niño–Southern Oscillation (ENSO), Interdecadal Pacific Oscillation (IPO), North Atlantic Oscillation (NAO), and smoothed decadal NAO on six ETC characteristics derived using an impacts-based tracking algorithm. The correlations between the PNA or ENSO and the ETC characteristics and composite ETC anomalies exhibit numerous similarities, however ENSO seems to have a more significant impact on ETC frequencies over East Asia and ETC intensities and lifespans over the Rocky Mountains lee storm track than the PNA. The IPO has a less significant impact than the PNA and ENSO over much of the North Pacific storm track. Meanwhile, the interannual NAO has a significant impact on various ETC characteristics over North America, the North Atlantic and Europe, while the decadal NAO's impacts are confined mainly to the North Atlantic. Physically, the North Pacific climate modes cause shifts in the subtropical North Pacific jet, altering the waveguide into North America, while subtle differences in PNA and ENSO-induced ridge-trough strength and positioning lead to different ETC anomaly patterns over Canada particularly in intensity and lifespan. Meanwhile, the North Atlantic climate modes involve shifts in the North Atlantic jet stream and storm track, yet atmospheric variables governing ETCs (such as upper-level winds and baroclinicity) generally exhibit weak changes over the North Atlantic and Europe on decadal scales.

Poster Presentation Abstract

March 15th, 2025

The Gallery

1:30 PM – 2:15 PM

A Comparison of Dual-Polarimetric Radar Variables in Two Lake-Effect Storms With and Without Lightning During the Lake-Effect Electrification (LEE) Project

Ezekiel Caldon, Dr. Scott Steiger, Dr. Yonggang Wang

SUNY Oswego

One of the aims of the Lake-Effect Electrification (LEE) Project, which was undertaken from September 2022 to March 2023 on the east shore of Lake Ontario, is to define environmental and radar-based thresholds for lightning in lake-effect storms. Dual-polarimetric radar variables, including reflectivity, differential reflectivity and specific differential phase from lake-effect events are analyzed from two intensive observation periods (IOPs) – one with lightning, on 20 Nov 2022, and one without lightning, on 19 Dec 2022 – to form and test baseline radar variable characteristics for electrification in cool-season lake-effect storms. Data from the X-band Doppler on Wheels, KTYX WSR88-D S-band radar, and the NSSL and Georgia Tech lightning mapping arrays are leveraged to make inferences about precipitation particles and to determine when lightning strikes occurred.

Both storms are shown to have regions with enhanced reflectivity and specific differential phase indicating convective cells and dendrites within the storms, and both have ground observations of graupel precipitation, albeit with larger particles in the lightning case. The lightning case is also found to have a distinctive negative differential reflectivity area on both the PPI and RHI cross-sections at about 2 km MSL 6 minutes before a nearby lightning strike, suggesting dendritic clumps or graupel, while the non-lightning storm had relatively uniform differential reflectivity. In addition, the cloud top heights are about a kilometer higher in the lightning case, confirming conclusions of previous studies that sufficient cloud depth is necessary for thundersnow.

Poster Presentation Abstract

March 15th, 2025

The Gallery

1:30 PM – 2:15 PM

An Overview of Wisconsin's Antarctic Meteorology Program

Jonathan Chambers, Matthew Lazzara, AMRDC/AWS Team

Antarctic Meteorological Research and Data Center, Space Science and Engineering Center, University of Wisconsin-Madison, Department of Atmospheric and Oceanic Sciences, University of Wisconsin-Madison, Department of Physical Sciences, Madison Area Technical College, Madison, WI, USA

Antarctica is home to some of the harshest weather in the world and thus, understanding that environment requires observations. The Antarctic Meteorological Research and Data Center (AMRDC) team of faculty, staff and students bring their varying areas of expertise from both the University of Wisconsin-Madison and Madison Area Technical College to achieve the goal of "observing where people aren't!" One major activity is to collect and organize Antarctic meteorological data effectively and efficiently for community use. Wisconsin is also responsible for maintaining an Automatic Weather Station (AWS) network comprised of 57 stations across the Antarctic continent since 1980. This presentation will briefly discuss the AWS project, including the availability of real time data, our partnerships with other groups, and details pertaining to our publicly accessible database. A review of our latest 2024-2025 field campaign where four of our members deployed to McMurdo Station near the Ross Ice Shelf. There they performed an assortment of tasks including routine maintenance of the AWS sites, repairing broken weather instruments, deconstruction of old stations, and the construction of a new 30-meter AWS named Elijah Tall Tower. Unfortunately, this last season was plagued by worse than average weather that canceled many of their flights to the AWS sites. During the team's deployment, nearly three weeks were succumbed to downtime due to the inclement weather in the vicinity of McMurdo Station. These composites, which depict Antarctica's harshest weather, are made by uniquely combining geostationary and polar-orbiting satellites via a mosaicking process outlined in Lazzara et al., 2003, Lazzara et al., 2011, and Kohrs et al., 2014. Excluding brief outages over its lifespan, the Antarctic satellite composites have been in continuous production from 1992 to present. Other projects in progress include assisting with the research analysis of the Antarctic boundary layer in Antarctica via two tall tower AWS near or on the Ross Ice Shelf, numerical model verifications and quality control of our AWS observations, and optimizing the placement of new sites to shrink the gaps in the data we receive from Antarctica. All the observations from these networks can further be applied and compared to reanalysis data. This helps indicate how well reanalysis and climate models consider the various dynamics happening near the surface with the combination of surface measurements and remote sensing. The presentation will conclude with research involving all of these observations in the study of cloud mass meridional transport (CMMT) events and atmospheric rivers (AR) tracking algorithms.

Poster Presentation Abstract

March 15th, 2025

The Gallery

1:30 PM – 2:15 PM

Lightning Flash Measurements for Winter Thunderstorms in Central Florida

Patrick George

VTSU Lyndon

Central Florida, known as the “lightning capital” of the United States, experiences the highest lightning density in the country, with over 223 lightning events per square mile in 2021. This study builds on the work of Fuelberg et al. (2014) by focusing on winter ordinary non-severe thunderstorms and comparing them to summer thunderstorms, with the goal of enhancing lightning safety protocols. Florida's high lightning casualty rates, including over 2,100 injuries and fatalities from 1959 to 2004, underscore the need for effective safety measures. The study emphasizes the 30/30 rule as a key guideline for public lightning safety and explores the advances in lightning detection technologies, such as the National Lightning Detection Network (NLDN) and the Lightning Detection and Ranging (LDAR) network. By examining the mechanisms of thunderstorm electrification and lightning discharge, this research aims to improve understanding of lightning behavior and inform strategies to reduce fatalities and injuries. The study also investigates the impact of aerosol particles, particularly from wildfire smoke, on lightning charge distribution. Overall, the findings contribute to refining lightning safety practices and promoting public awareness, especially in high-risk areas like Florida.

Poster Presentation Abstract

March 15th, 2025

The Gallery

1:30 PM – 2:15 PM

A Climatology of Blowing Snow in the United States and Canada

Miles Gray, Audrey Simmons, Neil Laird

State University of New York at Oswego, North Carolina State University, Hobart and William Smith Colleges

Blowing snow (BS) can make many forms of travel dangerous and investigating where BS occurs frequently is important to understanding the linkage between hazardous conditions and impacts on travel. This unique research is one of only a few studies to use observations to identify occurrences of BS and investigates the spatiotemporal variations of observed blowing snow hours and associated conditions during an extended time period over a large continental region. The study uses surface hourly observations from 133 stations across Canada and the United States during the 40 cold seasons (October – April) of 1979/80 to 2018/19. The Canadian Arctic region has recorded the greatest number of BS hours over the 40 cold seasons. BS is most active during the month of January with a seasonal peak in the number of BS hours for most locations and a regional equatorward expansion in locations experiencing hours with BS. During the 40 cold seasons, BS hours have increased with time in most of Canada while decreasing across the United States, including Alaska. Observations of surface wind speed and air temperature were compared to the threshold wind speed needed for BS derived from an empirical model. The average observed wind speed during BS hours across western and central Canada was found to be slower than the predicted threshold necessary and the average observed wind speed during BS hours in many regions across the United States, especially the Central Plains, and eastern Canada was found to be faster than the predicted threshold.

Poster Presentation Abstract

March 15th, 2025

The Gallery

1:30 PM – 2:15 PM

Cloud Collecting: A Gateway to the Study of Meteorology for Pre-College Students?

Alex Hennighausen, Flora Lemon, Theresa Ruggiero, Thomas Retterer-Moore, Elise McMarrow, Kai Henning, Allison Beck, Calista Wong, Gwendolyn Muno, Elliot Hopkins, Elizabeth Schmidt

Concord Carlisle Weather Services

Concord-Carlisle Weather Services is a small high school weather club located at Concord-Carlisle Regional High School (CCHS) in Massachusetts. This club is ideal for students who want to pursue meteorological topics and projects as well as produce weekly forecasts for the school community using our rooftop weather station data. One of the services the club provides our student body in addition to forecasts, is support with the cloud project that all 9th graders submit in their introductory meteorology unit.

All incoming 9th grade students at CCHS take a survey course called “Planet Earth,” in which meteorology topics are covered for roughly a month and a half. The unifying project during this unit of study is called the “Cloud Collection Project,” in which students are given a list of clouds and the point values they have been assigned. Students “collect” clouds for their projects by getting a photograph of the cloud. The CCHS earth science teachers have done this project for the last 8 years and hypothesize that this project engages students in the study of weather, but have, up until this point, relied on anecdotal data to support this hypothesis.

In addition to our cloud identification support service, Concord-Carlisle Weather Services will conduct a survey of as many students as possible, asking questions about their experiences relating to the “Cloud Collection Project.” We want to know if student interest in clouds and meteorology topics has increased or decreased as a result of this project and if it has a lasting impact on the way they view the sky and the study of nature in general.

Making meteorology outreach projects engaging encourages more people to become involved in weather observation and STEM topics in general beyond school. Our main goal with this study is to better understand what motivates people to get interested in weather beyond school. Obviously, seeing the rare, powerful, or beautiful things which we encourage people to look for can be very motivating, but we are hoping to go the extra mile with this project to simply understand how to make the high-school level weather topics more fun. We want to get people interested early on so they will be lifelong observers and critical thinkers in the natural world outside of the structured classroom.

Poster Presentation Abstract

March 15th, 2025

The Gallery

1:30 PM – 2:15 PM

Qualitative analysis of anticyclonic tornadogenisis within a right-moving, cyclonic supercell: A Case Study of an EF1 Tornado near Loveland, Oklahoma

Nicholas Hurter, Dr. Frank Colby

Department of Earth, Atmospheric, and Environmental Sciences, Kennedy College of Sciences, University of Massachusetts - Lowell, Lowell, MA

On the afternoon and evening of April 30th, 2024, a synoptic scale low pressure system and cold front, in combination with increased instability, humidity, and wind shear, triggered rounds of severe thunderstorms and tornadoes throughout the Midwest and Great Plains states of the United States. This event was forecasted particularly well for the main risk area across portions of the midwest, but struggled with forecasts across Oklahoma and the Southern Plains, especially for tornadoes. This paper examines one tornadic supercell during this event, which produced multiple cyclonic and anticyclonic tornadoes throughout its life in Southern Oklahoma. Radar images of this supercell are analyzed using reflectivity, velocity, and correlation coefficient products to identify the locations of these tornadoes relative to one another and identify a potential cause of the anticyclonic tornado's formation. Additionally, past studies on similar cases are examined to further solidify our conclusion. Preliminary research shows that 2 boundaries were present within this supercell, a main Rear Flank Downdraft (RFD) and internal RFD, which likely interacted, resulting in the spin up of an anticyclonic tornado proceeding the parent cyclonic tornado. Further research for this case will be done to determine why tornadoes weren't well forecasted with this event in the region being studied up until the final few hours before the first tornado.

Poster Presentation Abstract

March 15th, 2025

The Gallery

1:30 PM – 2:15 PM

A comparison Of The Effects Of Teleconnection Patterns on The Total Number And Severity Of Snowstorms From 1994 Through 2024 In The Northeastern United States

Caitlin Lawrence

This research analyzes the comparison of the effects of the teleconnection patterns associated with the the total number of snowstorms and the severity of the quantity of snowfall in the northeastern United States from 1994 through 2024 during the winter months of December through February. Each teleconnection pattern will be studied as to how it relates to the number and quantity of snowfall. Then, these results from each individual teleconnection pattern in the northeast United States will be compared to all of the teleconnections combined to produce results that explains which teleconnection patterns promotes the most snowstorms and the most severe as well from four inches or more of snow. These outcomes of these scenarios will help forecasters determine higher confidence levels in seasonal outlooks as well as issuing snowstorms with different levels of severity by understanding how these climate patterns effect the winter forecasting scenario in this region. The states included will be New York, Vermont, Connecticut, Rhode Island, Massachusetts, Maine, and New Hampshire. This research provides information that is statistically significant and meteorologically reasonable.

Poster Presentation Abstract

March 15th, 2025

The Gallery

1:30 PM – 2:15 PM

An Observational and Numerical Study of Lake Enhanced Thunderstorms

Tyler Lucia, Dr. Yonggang Wang, Dr. Steven Skubis

Thunderstorms are a common phenomena that occur in the United States during the warm season due to an ample amount of heat and moisture that is present in the lower atmosphere. The Great Lakes region is no exception to this. It is widely known that the surface temperature of the Great Lakes lags behind the ambient air temperature. The difference between the ambient temperature and the lake surface temperature causes various levels of atmospheric instability. In early winter, the lower atmosphere is the most unstable since the lake temperature is much higher than the ambient temperature, and lake effect precipitation often occurs. Summer-time represents a transitional period, where the atmosphere is stable in early summer and becomes unstable by late summer. These various instabilities, caused by the changing lake surface temperature, are expected to affect thunderstorms passing over the lakes.

This research project investigates and interprets how and if the lake-surface temperature will affect the intensity of storms that are passing over the lakes. Three cases were selected as case studies, with two occurring within the vicinity of Lake Erie and one over Lake Ontario. Case 1 reflects conditions in early summer, when the lake surface is still cooler than the average 2-meter air temperature. It depicts a potent squall line that weakens as it crosses Lake Erie towards Buffalo. Case 2 reflects conditions in the middle of summer, when the lake surface becomes around the same as the 2-m air temperature. It depicts a supercell that spawned an EF2 tornado just off of Lake Erie's eastern shore. Case 3 reflects conditions in late summer or fall, when the lake-surface temperature is much greater than the 2-m air temperature. It depicts isolated rain showers that rapidly develop into thunderstorms whilst over Lake Ontario. The WRF model was used to simulate case 1. By comparing the model reflectivity and NEXRAD reflectivity from KBUF, KCLE, and KDTX, it can be concluded that the WRF model can accurately simulate the structure and intensity of the storm system. Sensitivity tests of case 1 were conducted by increasing the temperature of Lake Erie by 2°C for each run. Data from these case studies, WRF model simulation results, and preliminary sensitivity testing results from case 1 will be presented.

Poster Presentation Abstract

March 15th, 2025

The Gallery

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Stormwater, an Analysis of Extreme Rainfall Frequency at SUNY Oneonta

Aidan Messier, Christopher Karmosky

SUNY Oneonta

The South Campus Runoff and Pedestrian Project aims to improve the capabilities of an outdated stormwater drainage system at SUNY Oneonta. Significant rainfall events overstress the current system causing flooding when large quantities of water flow through a limited diameter outlet pipe. To address this, the campus is exploring the possibility of burying multiple storage tanks to divert rainfall and slowly release it back into the outlet pipe. The problem this research addresses is determining the frequency and magnitude of these problematic rainfall events. Three data sets of five minute rainfall quantities were utilized, representing approximately 6.5 years of rainfall measurements. Data were collected by successive rooftop automated weather stations with a tipping bucket precipitation gauge. An event with rainfall rates of four inches per hour or greater is expected about every 5.9 years, while events with rates of 2.5 inches per hour or greater occur 2.4 times per year. The information learned from this project has been presented to the team of project engineers, who will optimize the volume according to the frequency of extreme rainfall events and the increased impermeable surfaces on campus.

Poster Presentation Abstract

March 15th, 2025

The Gallery

1:30 PM – 2:15 PM

Development of a Lightning Climatology for Wind Farm Development Areas in the Eastern United States: Focus on the New York Bight and Upstate NY

Patrick Miller, Dr. Jeffrey M Freedman

SUNY Albany ASRC

Using data from the National Lightning Detection Network (NLDN; Orville, 1983), this work creates a detailed lightning climatology for areas of proposed offshore wind farm development, with focus on the New York Bight (NYB), encompassing regions adjacent to the New York, New Jersey, Rhode Island, and Massachusetts coasts. With multiple wind farms possibly exceeding cumulative capacity of 10000 MW by next decade, this work is key to summarizing the potential lightning risk to the region. The climatology includes diurnal, seasonal, and interannual analysis of flash density and polarity for cloud-to-ground (CG) lightning flashes. Specific storm types are also assessed to see which produce the most lightning offshore, as well as over onshore wind farms.

This work also examines the potential effects of existing wind farms located on the Tug Hill Plateau in New York, offshore of Virginia, and south of Rhode Island on CG strike frequency, by analyzing NLDN data from before and after the deployment of the turbines. The analysis uses NLDN data from 1990-2024, beginning when the network became fully operational. To mitigate potential misrepresentation of low-current intracloud flashes as CG strikes due to enhanced sensor sensitivity, the dataset excludes any positive CG strikes with a current amplitude of less than 15 kiloamperes (kA) and any negative CG strikes below -5 kA.

The analysis of CG flash density from 1990-2024 shows some interannual variability, likely influenced by the variability of storm activity and location between years. Coastal and offshore areas in the New York Bight exhibit slightly lower flash densities compared to Upstate NY, with more significant disparities in spring and summer when land temperatures exceed water temperatures. Diurnal variability is evident across the domain, including across wind lease sites offshore in the NYB. An examination of CG strike distance from wind turbines shows a clear increase in CG strikes directly over wind turbines, across several seasons, highlighting that turbines are triggering lightning, that otherwise may not have occurred.

Poster Presentation Abstract

March 15th, 2025

The Gallery

1:30 PM – 2:15 PM

Significant Late Season Snow and Precipitation Events in the White Mountains

George Mousmoules, Charlie Peachy

Plymouth State University, Mount Washington Observatory

There have been multiple studies conducted based on both observational data and climate modeling that indicated significant snow events will likely continue at a steady or increasing rate in the Northeastern U.S. This was despite a shortening winter season in the region due to climate change. This study investigated how significant late-season snow and precipitation events have been changing in frequency, intensity, and duration in the White Mountain region. This investigation analyzed data from 1995 to 2024, focusing on the period of March 1st to June 30th for each year. Data originated from the B16 daily archives kept at the Mount Washington Observatory and observations collected at the Pinkham Notch Visitor Center. This included daily snowfall, precipitation, and snow depth recorded for each day during the period of study. 90th percentiles were calculated for daily data and separately calculated for three and five-day running averages to capture multi-day events. Code was generated using Python to run calculations and generate visualizations. Multi-day events were verified manually using upper-level and surface charts along with radar data from the National Center for Environmental Information. Significant snow and precipitation events stayed consistent at MWO while snowfall events slowly increased and precipitation events remained the same at the Notch. Event intensity was similar between MWO and the Notch with MWO observing more outlying events. Significant events typically lasted two to three days and no longer than five days. Understanding these trends can increase forecast knowledge and accuracy and better inform the public about these impactful events.

Poster Presentation Abstract

March 15th, 2025

The Gallery

1:30 PM – 2:15 PM

A First-Ever Observational-Based Snowpack Climatology for the Northeastern United States

David Zywiczynski, Eric Kelsey

Plymouth State University

Snowpack plays a critical role in the hydrology, ecosystems, and economy of the northeastern United States, serving as a natural reservoir and impacting flood management, agriculture, and winter tourism. Currently, the National Oceanic and Atmospheric Administration (NOAA) and National Weather Service (NWS) rely on the Community Collaborative Rain, Hail and Snow Network (CoCoRAHS) and Cooperative Observing Program (COOP) to determine real-time snowpack depth and snow water equivalent (swe). The National Operational Hydrologic Remote Sensing Center (NOHRSC) utilizes these and other datasets in the Snow Data Assimilation System (SNODAS) to model high-resolution snowpack properties across the country, dating back to 2003. Despite these valuable datasets, climatological values of depth and swe do not exist for sites in the Northeastern US.

This two-year NOAA-sponsored project, which began in the summer of 2024, aims to establish the first observational-based, daily climatology of snowpack in New England and New York by leveraging a comprehensive dataset of snow depth and swe measured by various organizations. Spanning seven states, seven decades, and over 400 sites, the dataset was quality-controlled using Python to remove erroneous values. Climatological normals of snow depth and swe will be calculated using a fourth-degree polynomial regression at each site. Many other metrics such as a snow drought index, median snow-out dates, and snowpack trends will be calculated and examined to offer deeper insight into regional snowpack variability.

With pronounced snowpack declines seen in the region, the implications for numerous sectors will be significant. The results from this project will contribute to a broader understanding of snowpack depth and swe in the region, helping inform water resource management and drought and flood risk assessment.

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