UNIVERSITY OF NORTH DAKOTA ATMOSPHERIC SCIENCES

NORTHERN LIGHTS

Issue 9

ATMOS AHERIC SCIEN

FALL 2021

Letter from the Interim Chair, Matt Gilmore



Welcome to the Fall 2021 edition of our newsletter. This has been a year of changes. Some of these changes have been sad as we've seen some of our favorite professors retire or move on to other prestigious positions in our field. Some of the changes have been stressful and scary to both faculty and students alike, such as adjusting to the Covid-19 safety and distancing protocols. Some of these changes are exciting, such as the new faculty positions that have opened and the four colleagues - bringing new ideas – who will be arriving over the next school year.

Distinguished Chester Fritz Professor, Mike Poellot, retired August 16th after 45 years of service to UND. Along with Leon Osborne and Tony Grainger, Mike was instrumental in starting the UND Dept. of Atmospheric Sciences. He is now Professor Emeritus. Another student favorite, Professor Gretchen Mullendore, accepted a position leading National Center for Atmospheric Research's Mesoscale and Microscale Meteorology Division. As we sadly see our faculty depart, two faculty searches recently finished and two more faculty searches are beginning this fall. Mike and Gretchen will be greatly missed.

Our first new hire this fall is Dr. Jared Marquis who had previously taught while a UND graduate student. Jared will teach the synoptic and forecasting classes that our late esteemed colleague, Leon Osborne, used to teach. Additionally, we are excited about three additional faculty who will be selected over the next 6 months to grow our excellent team. Stay tuned !

Other exciting UND news includes the newly-finished Memorial Student Union, the addition of our new UND president, Andy Armacost, who joined us after serving as dean of the U.S. Air Force Academy. You may read more about the Memorial Union and President Armacost here:

> https://und.edu/directory/andrew.armacost https://und.edu/student-life/union/

Several faculty received new grant funding over the past school year. Our graduates continue to find employment with the public and private sectors.

In closing, we thank the generous contributions of our friends, alumni, and industry partners who have continued to fund our student scholarships, including the Leon F. Osborne Science in Society Award, the Carlton Bjerkaas scholarship, Frank Bavendick Meteorology Scholarship, and the Science Engineering Associates Scholarship. For more information on how you can contribute to our program, please see page 11.

Matt

Wanda Seyler, Editor

INSIDE THIS ISSUE

Letter from the Interim Chair	1
Mike Poellot Retires	2
New Faculty Hires	3
AGU Annual Meeting	4
AMS 2021Annual Meeting	4
AtSc Field Campaigns	5
Recent AtSc Graduates	7
Incoming Graduate Students	7
Dept News—Trece Hopp— Hollings Award	8
AGU Annual Meeting	9
AMS 2021Annual Meeting	9
Retirement Reception Photos	10
AtSc Sky Cam	11



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Department News

Mike Poellot Retires after 45 years at UND

Chester Fritz Distinguished Professor **Mike Poellot** retired August 15, 2021 after 45 years with the Atmospheric Sciences department.



Mike came to the University the Fall of 1976 when John D. Odegard offered him a full-time position as a

Research Meteorologist with the Weather Modification Research Group. He received his M. S. degree from Colorado State University in Atmospheric Science in 1975 and a B.S. in Physics from Valparaiso in 1972.

With the Department he assisted in basic research of total-area effects of cloud seeding. In 1977 he was promoted to Assistant Research Professor. His duties included performing research in total-area effects of cloud seeding, development of computer algorithms used in analysis and methods of determining seeding effects, conducting research in mechanisms of total-area effects, coordinator and instructor for the UNO Weather Modification Pilot Training Program, fore-caster and Learjet scientist/co- pilot for the Extended Area Effects Exploratory Experiment , 1979 , and scientist and co-pilot on the UND Cessna Citation II research aircraft since 1980.

Mike has brought to the University over 10 million in research dollars. Mike obtained the certification to be a pilot of the Cessna research craft and flew many research missions with several pilots, crew members and students. He taught the first class of aviation weather to aviation students and the first class of weather modification. Over the years he worked with 425 aviation students for the weather modification program, training all but 37.

Mike was the first of the core of three professors (with Tony Grainger and Leon Osborne) that started the Department of Atmospheric Sciences. Mike has taught in the Department of Atmospheric Sciences since its inception and was Chair of the department from 1999—2020. Mike has served on many University of North Dakota committees over the years and is well known across campus. Students have always been a priority for Mike and he has mentored many over the years, undergraduate to doctorate. In addition to his contributions to the University of North Dakota, Mike has served on national committees, participated in professional societies and attended national and international conferences.

Mike will be missed by the students, faculty and staff of Atmospheric Sciences.

Enjoy your retirement, Mike!





New Faculty Hires

Assistant Professor -~Jared Marquis



Jared Marquis graduated in August 2021 with his Doctoral degree. He also graduated from UND With his Master's Degree and has a Bachelor's Degree from the University of Louisiana—Monroe.

He has several years of in-

structing experience at UND and Sitting Bull College on the Standing Rock Reservation in North Dakota. His research centers around satellite infrared radiance assimilation with further interests in data assimilation, remote sensing, numerical weather prediction, and cloud physics.

In addition to funded research Jared also enjoys running and training students using the UND NorthPol radar. Non-science hobbies include watching & playing sports and playing with his two dogs. Jared Marquis looks forward to instructing courses, continuing research, and leading UND's 4+1 Atmospheric Science Combined BS-MS program.

Instructor-Nikki Carson-Marquis



Brittany (Nikki) Carson-Marquis, from Middletown, Maryland, is a B.S. graduate of University of LA—Monroe and a 2020 M.S. graduate of UND's Atmospheric Sciences. She was hired this fall to teach

an AtSc 110 class, along with working remotely for AERIC LLC., Boulder, Colorado. AERIC's co -founder is a UND AtSc graduate and is a Colorado-based atmospheric science and software engineering company. Her hobbies include spending time with their two dogs, Macha and Kona, knitting, gardening and researching genealogy.

Assistant Professor ~ Montana Etten-Bohm



Atmospheric Sciences is pleased to announce that Montana Etten-Bohm will join our department as an Instructional Assistant Professor starting Fall 2022! She will be teaching an online AtSc 110 class in Spring 2022.

Montana is currently finishing her PhD at Texas A&M University and will primarily teach our ATSC 110 Meteorology I course.

Montana's past research has explored the effectiveness of different teaching methods in STEM classrooms, and she aims to incorporate this expertise into her classes at UND to create interactive and engaging learning environments. She'll expand this research further at UND with the ultimate goal of improving student learning in the field of meteorology as a whole.

In her free time, Montana enjoys playing soccer, running triathlons, watching New York Giants football, and caring for her two cats, Enso and Mara.

We are very excited that Montana has chosen to join us!



If you received a copy of this newsletter in the mail and would prefer to receiveit via email, please drop Wanda an email at wanda.seyler@und.edu and she will get you added to the email list.

32nd Annual Awards & Scholarship Banquet

The 32nd Annual Atmospheric Sciences Awards & Scholarship Ceremony was held on Friday, April 23, 2021 without the banquet. The following awards were given by the Atmospheric Sciences Faculty and the UND Student Chapter of the American Meteorological Society.

The following awards were presented to the following undergraduates:

Outstanding Freshman – Blake Rafferty and Payton Braun; Outstanding Student Broadcaster -Justin Storm and Caitlin Connell; Outstanding Undergraduate Teaching Assistant – Dillon Vogt; Outstanding Undergraduate Student Researcher – David Singewald; Outstanding Sophomore -Bruce A. Smith Aerospace Scholarship – Trece Hopp; Outstanding Junior – John D. Odegard Aerospace Sciences Scholarship - Casey Toavs; Outstanding Graduating Senior - Erin Doyle and Caitlin Connell; Outstanding Service to the Department – Evan Rys; Science Engineering Associates Scholarship—David Singewald, Maddi Cruff, Lucas Castro; Carlton Bjerkaas Atmospheric Sciences Scholarship –Nicholas Camp, Cassidy Holth, Josh Kern, Sara Hall; Frank Bavendick Meteorology Scholarship - Dillon Vogt; Leon F. Osborne Scholarship - Cassidy Holth.

The "Faculty Award" to the Outstanding Undergraduate was presented to B.S. senior Evan Rys in December 2020. This included a scholarship to be used for his last undergraduate semester at UND. The UND AMS Student Chapter voted to give the following faculty awards: Best Freshman & Sophomore Professor – Fred Remer; Best Junior & Senior Professor – Jianglong Zhang; Best Academic Advisor – Fred Remer; Golden Reamer Award – Matt Gilmore; 7-Eleven / Most Available Professor – Fred Remer; Night Owl Award—Fred Remer; Best Graduate TA—Ben Remington; Department Powerhouse Award – Sue McWilliams and Wanda Seyler.

The UND Weather Update Group gave out some fun awards: *Most Fashionable Award*—**Trece Hopp** for most fashionable anchor; *The Evan Rys Award*—**Evan Rys** for most creative intro (for a slideshow shown at the awards ceremony); *Golden Play Button Award*—**Lauren Larsen** for the most viewed broadcast; *Most Improved Award*—**Dillon Vogt** for the greatest improvement; *Tech Guru Award*—**Devin Bissell** for the most helpful with Tech; *Aspiring Anchor Award*—**Lucas Castro** and **Shelby Ebetowski** for aspiring to become an anchor.

The UND AMS Student Chapter held Photo Contests and the Award Winners were: Sept 2020 Award – Sunrise/Sunset by Caitlin Connell; Oct 2020 Award – Fall Colors by Rachael Erickson; Nov 2020 Award—Nature/ Wildlife/ Oddly Shaped Things in Nature by Rachael Erickson; Feb 2021 Photo Contest – Sun Dogs by Blake Sorenson, Ph.D. Grad Student.

Congratulations to all!



THE NORTH DAKOTA STUDENT CHAPTER OF THE AMERICAN METEOROLOGICAL SOCIETY

The UND Student Chapter of the American Meteorological Society has designed a new logo and it has been approved by UND.

UND-AMS Officers 2021-2022

President - Dillon Vogt

Vice President - Lauren Larsen

Secretary - Maddi Cruff

Treasurer - Lucas Castro

Historians - Shelby Ebertowski & Rachael Erickson

Student Liaison to Undergraduate Curriculum Committee -Cassidy Holth

ATMOSPHERIC SCIENCES FIELD CAMPAIGNS

Particle Imaging and Ceilometer Observations for Snowfall Properties and Blizzard Parameters

Field work for the department will continue into the winter. Dr. Aaron Kennedy, Associated Professor, recently received \$178K from NOAA to fund a 2-yr, collaborative proposal with University of Wisconsin - Madison and the NWS entitled 'Particle Imaging and Ceilometer Observations for Snowfall Properties and Blizzard Parameters'. This project will demonstrate how novel instrumentation can be used to monitor snowfall leading up to blizzards and aid nowcasting of these events.

COX Icing Tunnel Experiment Spring 2021

The University of North Dakota has an ongoing interest in conducting atmospheric research to understand fog, advances in airborne platforms, and weather modification research. CAV Systems has a long history of developing icing protection systems. UND and CAV Systems worked together on a project to test an icing protection system for rotator type unmanned aircraft systems (UAS). An application of the UAS icing protection system is conducting cloud seeding to reduce fog at critical facilities such as airports. Silver Iodine cloud seeding flares are effective at dissipating super-cooled fog (where the temperature is below 0 °C). Our experiments at the COX Icing Tunnel on Long Island, New York clearly demonstrated that flying a rotator type UAS in super-cooled fog typical of the atmosphere for even short periods (minutes) degrade performance to the extent of requiring landing. The developed ice protection system would extend the flight duration of the UAS sufficiently; however, there would be an overall flight duration reduction due to the additional weight of the ice protection system. Our experiment is the first step in enabling UAS to operate in super-cooled fog, which will enable cloud seeding by companies, such as Weather Modification International based in Fargo, ND to conduct weather modification project utilizing UAS platforms.

RAPID: North Dakota Field Measurement Campaign to Improve Understanding of Fog Processes

The University has received a \$45,000 RAPID Grant from the National Science Foundation to conduct fog measurements. Dr. David Delene, AtSc research professor, leading the project, said that while it's not a large project in comparison to other airborne research projects, data from the observations will benefit those larger research efforts.

The grant will support two month-long observational periods near Hector International Airport in Fargo to improve the understanding of fog processes and related atmospheric interactions, such as clouds, aerosols and turbulence.

The observations will take place this fall and next spring.

At the NSF, RAPID refers to Grants for Rapid Response Research. RAPID allows funding for research proposals that require urgent access to data, facilities, equipment and quick-response research on natural disasters and similar unanticipated events, the federal agency reports.

Fog is a major nuisance and can be extremely dangerous for land and air travel alike. Reduced visibility caused by fog causes hundreds of millions of dollars in damage annually, including severe road accidents and aviation disasters resulting in loss of life.

"Road accidents and aviation crashes caused by fog remain frequent," said Marwa Majdi, a postdoctoral researcher in the Department of Atmospheric Sciences. "Around 440 people are killed due to weather-related aviation accidents each year, including accidents affected by low visibility and low cloud layers.

"It is crucial to improve the forecasting of fog and have refined weather products. This is challenging due to the complexity of the processes involved in fog formation, development and dissipation that are not well-represented in the current numerical weather prediction models."

In order to advance our understanding of fog processes and forecasts, as much data as possible must be collected during fog events. The challenge lies in conducting observations at the right time of day and at the correct location.

Page 6



ATMOSPHERIC SCIENCES FIELD CAMPAIGNS ~ DCOTTS

The NASA Bynamics and Chemistry of the Summer Stratosphere (DCOTSS) address convective impacts on the summer stratosphere over North America. University of North Dakota (UND) is supporting DCOTSS in part by conducting OzoneSonde weather balloon flights at the University of North Dakota. Measurements of the vertical profile of ozone help to understand the North American Monsoon Anticyclone (NAMA) and how strong convective storms penetrate deep (up to 20 km AGL) into the lower stratosphere. A total of 34 balloon flights are planned during the summer of 2021 and 2022 field project period from Grand Forks. UND Students involved in the project with Dr. David Delene, Research Professor, were Master's Grad Students Devin Bissell and Elizabeth Sims, along with Undergrad Students Nicholas Camp, Maddi Cruff, Aanan Schlief and David Singewald.



Elizabeth Sims getting things ready



Devin Bissell with the ozonesonde attached to the balloon.



Balloon is filled up! L to R: Trece Hopp, Maddi Cruff, and Dr. David Delene



Ready to launch! Trece Hopp, Aanan Schlief and Elan Azriel, a prospective undergraduate here for a visit at launch time





December 2020 B.S. Graduate

Gabe Benson Waiwan (Cecelia) Ling Connor Smith

December 2020 M.S. Graduate Nicole Loeb

May 2021 B.S. Graduates

Emily Archer Caitlin Connell Erin Doyle Julianna Glinskas Katherine King Dylan Myrvik Andrew Newcomb Evan Rys Justin Storm Logan Torgerson

May 2021 M.S. Graduate Caitlyn Mensch

August 2021 M.S. Graduate Sankha Subhra Maitra

August 2021 Ph.D. Graduates Jared Marquis

Congratulations!! Graduates!!



Incoming Graduate Students

The Fall of 2021 we will have ten new graduate students working on their Master's.

They are:

Brian Horan, South Haven, Michigan, received his B.S. in Meteorology and Computer Sciences with a minor in Mathematics and Information Technology from Central Michigan University in May 2021;

Andrew Kramer, Lockport, Illinois, received his B.S. from the University of Oklahoma in May 2021;

Talia Kurtz, Sparks, Nevada, received her B.S. from the University of Nevada – Reno in 2021;

Jennifer Moore, Sewell, New Jersey, is a 2021 graduate of the University of Pennsylvania—Millersville;

Julia Poblotzki, Middletown, Delaware, is a 2020 graduate with her B.S. in Environmental Sciences from the Eberhard-Karls-Universität Tübingen in Germany;

Chuck Richie II, received his B.S. in 2010 from Northern Illinois University in DeKalb and recently departed from the U.S. Navy as a Surface Warfare Officer;

Alec Sczepanski, Lancaster, New York, and is a 2019 B.S. graduate from State University of New York— Oswego and a 2021 M.S. UND graduate pursing his Ph.D.;

Logan Torgerson, East Grand Forks, Minnesota, is a May 2021 B.S. graduate of the University of North Dakota;

Taylor Wittman, Menasha, Wisconsin, received his B.S. in Meteorology and Mathematics with a minor in Physics from Northland College, Ashland, Wisconsin in May 2021;

Claiborne (Clay) Wooton, Louisville, Kentucky, graduated with B.S. in 2018 with a minor in Archaeology from the University of Louisville.

Welcome Students!

Follow the Atmospheric Sciences SkyCams from the roof of Clifford Hall on YouTube! youtube.com/undatmosphericsciences

Department News

Awards recognize students' academic achievements, leadership skills and career promise

Wrong, as UND sophomore **Patricia "Trece" Hopp** now is finding out. Hopp is one of several UND students who recently won prestigious national scholarships. In Hopp's case, she won a Hollings Undergraduate Scholarship, which the U.S. government offers under the umbrella of NOAA, the National Oceanic and Atmospheric Administration.

That means Hopp now will be getting academic assistance of up to \$9,500 per year for her junior and senior years at UND, plus a 10-week, full-time, paid (\$700 a week) internship at a NOAA facility during the summer.

During that summer experience, previous Hollings Scholarship recipients have found themselves north of Alaska, flying over the Chukchi Sea and deploying floats with a NOAA Arctic Research group; sailing on a NOAA research vessel off the coast of California; and in Hawaii, designing coastal nurseries meant to help the world restore its populations of coral.

Hearty congratulations to Trece and UND's other scholarship winners, who've discovered that for students who work hard and apply themselves, doors of opportunity have a way of swinging open, said UND President Andy Armacost.

"This experience will lay a foundation for Trece and the others to achieve their career goals, and it will introduce them to a new group of like-minded scholars," Armacost said. Now, here's more about "Trece" Hopp, the NO-AA/Hollings Scholarship recipient.

Hopp is an Atmospheric Science major at UND. That means she's especially interested in NOAA's role as the home of the National Weather Service, the agency that provides weather, hydrologic, and climate forecasts and warnings for the United States.

Through her summer internship, Hopp is hoping to research weather information accessibility, the process that makes sure all individuals – with and without disabilities, and from all walks of life – can access weather information.

"I am honored to have been selected to be part of NOAA's Hollings Scholarship Program," Hopp said. "I am absolutely thrilled for the opportunity. An abundance of gratitude goes to both my mentors in the atmospheric sciences department and in the Honors College; thank you for your support!"

Said Yee Han Chu, "Trece's strength as a scholarship candidate is her unique constellation of interests and how she will bring these perspectives into her work. While studying atmospheric sciences, she is also minoring in mathematics and dance.

"As an Honors student, she has discovered a critical link between atmospheric science and the social sciences and will look into researching the relationship between weather information and weather communication.

"It has been a delight working with Trece, who is so enthusiastic in all her interests. She arrived to UND knowing exactly what she wanted, and I am so happy that her focus and diligence have been rewarded."

ALUMNI NEWS WANTED

We are looking for news about you to share with other alumni in our upcoming newsletters (information about your current position, significant achievements, family activities, etc.). Also if you could please send us your current e-mail address and address changes it would be appreciated. If you have any ideas or comments about the newsletter, please send them to Wanda at: wanda.seyler@und.edu.

American Geophysical Union (AGU) Annual Meeting



The Annual Meeting of the American Geophysical Union was held virtually December 1-17, 2020. Presentations were given by the following Master Students: **Natalie Midzak** presented a poster titled "Constrained Retrievals of Aerosol Optical Properties Using Combined Lidar and Imager Measurements during the FIREX-AQ Campaign"; **Kaela Lucke** presented a poster titled "21st Century Shifts in Limiting Hazards that Determine Growing Seasons"; and **Christian Nairy** had two presentations, his poster was titled "Observations of Chain Aggregates in Florida Cirrus Cloud Anvils", and his oral presentation was titled "Radar and Airborne Observations in Florida Thunderstorm Anvils".



101ST AMERICAN METEOROLOGICAL SOCIETY ANNUAL MEETING, STUDENT CONFERENCE AND CAREER FAIR

The 101st Annual Meeting and Career Fair for the American Meteorological Society (AMS) was held January 10-15, 2021 virtually from New Orleans, LA. Dr. Aaron Kennedy, Dr. David Delene, Dr. Mark Askelson, and Wanda Seyler, covered a zoom session for the Career Fair during the Student Conference to visit with prospective graduate students from all over the U.S. and Canada.

Presentations were made by the following:

Faculty: Dr. Aaron Kennedy, Associate Professor, presented a talk titled "Low-Cost, Open Hydrometeor Imager for Research and Education"; and Dr. Jianglong Zhang, Professor, presented a talk titled "Observational and Modeling Study of Arctic Aerosols with the Assistance of an OMI Aerosol Index (AI) Data Assimilation System".

Master students: Kaela Lucke presented an oral presentation at the AMS Agriculture and Forest Meteorology Conference titled "Land Surface Model Impacts on the Atmosphere in the Northern Great Plains"; Elizabeth Sims presented an oral presentation titled 'Assessment of Blowing Snow Forecasts over the Northern Great Plains"; Alec Sczepanski presented a paper titled "Analysis of the 12 February 2020 Ground Blizzard during the BLOWN-UNDER Campaign"; Natalie Midzak presented a paper titled "Constrained Retrievals of Aerosol Optical Properties Using Combined Lidar and Imager Measurements during the FIREX-AQ Campaign".

Ph.D. student: Blake Sorenson presented an oral presentation titled "*Regional impacts of aircraft observation losses caused by the COVID-19 pandemic*".

Retirement Reception for Mike Poellot







A reunion from an early 1980's field project group happened at Mike's retirement party. L to R: Steve Skinner from Texas, retired Electronics Technician; Mike Poellot, Tony Grainger, Emeritus Professor, and Roger Tilbury from Montana, Retired Research Pilot.

Table Decorations with pictures in the center.





DEPARTMENT OF ATMOSPHERIC SCIENCES By Professor Emeritus mike Poellot

As you can see in this newsletter there is a lot going on in the Department of Atmospheric Sciences and we have been able to celebrate many successes. We would not have been able to accomplish much of what we do without the support we have enjoyed from the University and from the Dean's Office in the Odegard School. Still, we have ongoing needs to further help our students and programs thrive. To improve the educational opportunities for our students, we have determined two specific priorities that would greatly benefit from additional funding support: student scholarships and academic equipment.

At this time, we are asking friends, colleagues and former students of Leon Osborne to join in cementing his legacy by contributing to a scholarship endowment in his honor. The Leon F. Osborne Science and Society Award endowment is providing scholarships to students enrolled in Atmospheric Sciences within the Odegard School. The Award targets students who have demonstrated an understanding of the importance of atmospheric science to society and who are pursuing a career that would provide a direct benefit to the needs of society by promoting enhanced applications of the atmospheric sciences to address societal issues.

The other goal we would like to highlight is to upgrade several hardware and software components of our Doppler weather radar. This system, dubbed the "NorthPol" radar, was last upgraded in 2004 so some parts are at the end of their useful life. Students use NorthPol in their weather radar coursework and for collecting data for Senior Project research. We want our students to have the opportunity to work with state-of-the-art tools to adequately prepare them for entry into the work force.

If you are able to help with these priorities, please contact Interim Chair Matt Gilmore or Jonathan Gehrke. Our contact information is listed below. Your support is greatly appreciated.

Matt Gilmore Atmospheric Sciences Department 701-777-3124 matthew.gilmore@und.edu Jonathan Gehrke, Sr. Director of Development UND Alumni Association & Foundation 701-777-2633 jonathanG@undfoundation.org



Atmospheric Sciences Skycam

September 17, 2021 marks the three-year anniversary of the UND Department of Atmospheric Sciences Skycam. The current camera, facing west, has provided students, the department, UND and numerous others with great views of the Grand Forks skyline and weather phenomena. It has been featured nationally on the Weather Channel and WeatherNation. It was recently noted that you can see the airplane lights from the Grand Forks

Air Force Base 13 miles to the west if you look on the horizon. A second camera facing east was added to the Clifford Hall roof in September 2021.

youtube.com/undatmosphericsciences

East: : <u>https://www.youtube.com/watch?v=Jq6C162vNkg</u> West: <u>https://www.youtube.com/watch?v=mpcvRHLGBRw</u>