

**Message from Department Chair, Mike Poellot**

Greetings from the Department of Atmospheric Sciences! The start of a new school year is always an exciting time for both faculty and students. A new group of incoming first year and transfer students are beginning their UND experience while other more seasoned students see their studies drawing to a close. We wish them all the best in their endeavors!

This year has certainly been a time of transition in a number of other ways as well, with a couple of departures and new leadership. Our longtime secretary, MaryAnn Gregoire, retired in May after 40+ years of service to UND (more on page 6). She is the only secretary the department has ever had – she will be missed! To take on these duties, our new administrative secretary is Sue McWilliams, who has also worked at UND for some time. Welcome Sue! We also will be missing Dr. Xiquan Dong, who took a position at the University of Arizona after 14 years at UND.

The Odegard School has hired a new Dean, Dr. Paul Lindseth, to replace Bruce Smith who has retired. Paul previously served as the Associate Dean of the college. And at the highest level of the University, our new President is Mark Kennedy. A Minnesota native, President Kennedy came to UND from George Washington University.

Finally, it is with a heavy heart that I report the illness of our dear friend and colleague, Leon Osborne. Leon has been diagnosed with terminal cancer but continues to teach this fall (and hopefully beyond!) and continues in his role as Graduate Program Director. Leon's many contributions will be recognized through a number of activities now in the planning stage; additional information will be forthcoming. Please keep Leon in your thoughts and prayers.

Mike

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Incoming Graduate Students

The Fall of 2015 the incoming graduate students to the Atmospheric Sciences program at UND included eight students starting their Master's and two Doctoral students.

Master's Students are: **Rosa Brothman**, Holland, Pennsylvania, 2015 B.S. graduate of Millersville University of Pennsylvania; **Brooke Hagenhoff**, Jefferson City, Missouri, a 2015 B.S. graduate of the University of Oklahoma; **Ben Lott**, Pearl City, Illinois, a 2015 B.S. graduate of UND; **Emily Maddox**, Redfield, South Dakota, a 2015 B.S. graduate of UND; **Tim See**, York Haven, Pennsylvania, 2015 B.S. graduate of Millersville University of Pennsylvania; **Tyrus Skaer**, Swansea, Illinois, a 2015 B.S. graduate of the University of Illinois – Urbana; **Nathan Smith**, Ellsworth, Wisconsin, a 2015 B.S. graduate of UND; and **Elizabeth Staatz**, Shoreline, Washington, a 2015 B.S. graduate of UND.

Doctoral Students are: **Katelyn Barber**, Hamlin, New York, 2013 graduate of the State University of New York at Oswego and **Peng Wu**, Nanjing, China, a 2015 M.S. graduate of UND 2012 graduate of the Nanjing University of Information Science and Technology in Nanjing, China. Both are August 2015 M.S. graduates of UND.

In January 2016 we had three students began their M.S. studies and one Doctoral student.

Master's Students are: **Brittany (Nikki) Carson**, Austin, Texas, a 2013 graduate of the University of Louisiana – Monroe; **Brianna Kump**, Lake Elmo, MN, a 2015 B.S. graduate of UND; and **Logan Lee**,

High Bridge, Wisconsin, a 2015 B.S. graduate of UND.

Ted McHardy, Lapeer, Michigan, 2013 graduate of Cornell University in Ithaca, New York; and a 2015 M.S. graduate of UND is a doctoral student.

The Fall of 2016 the incoming graduate students to the Atmospheric Sciences program at UND included five students starting their Master's and two Doctoral students.

Master's Students are: **Samantha Carr**, Orangeburg, South Carolina, 2016 B.S. graduate of the University of North Carolina—Asheville; **Austin King**, Aubrey, Texas, 2016 B.S. graduate of the University of Oklahoma; **Xiao Ma**, Shaanxi, China, 2011 B.S. graduate of Nanjing University of Information Science and Technology in Nanjing, China; **Jon Starr**, Morris, Minnesota, 2010 B.S. graduate of the University of Wyoming in Laramie; **Alex Trellinger**, Niwot, Colorado, 2015 B.S. graduate of Metropolitan State College in Denver, Colorado.

Doctoral Students are: **Jared Marquis**, Houston, Texas, 2014 B.S. graduate of the University of Louisiana-Monroe; **Joe O'Brien**, South Amboy, New Jersey, 2013 graduate of Millersville University of Pennsylvania. Both are August 2016 M.S. graduates of UND.

Faculty Spotlight

Gretchen Mullendore

Gretchen Mullendore grew up in Gambier, Ohio. She attended several undergraduate schools including California Institute of Technology, Orange Coast College, and University of California – Santa Barbara where she received her Bachelor's degree in Geophysics. She also worked for a financial portfolio management company as a system administrator for 3 years before finishing her Bachelor's degree.



She graduated with her Doctoral degree from the University of Washington. She worked as a researcher at UCLA before starting at UND in September 2007. She is currently an Associate Professor.

Gretchen is married and she enjoys games, puzzles, and travel – especially to Las Vegas! She also has an awesome fun socks collection!

Her research focuses on storms, both their dynamics and how to represent them in models. She is also interested in developing ways to make numerical weather models easier to use and understand.

Gretchen serves as a faculty advisor for the Women in Science group at UND. The UND Women in Science groups connects women in the science field by providing a place to network and develop relationships that will support women in their goals to become involved in science.

Jianglong Zhang

Jianglong Zhang grew up in a providence in China near Tibet. He received his B.S. in Atmospheric Physics from Peking University, China in the spring of 1992. He received his M.S. in Atmospheric Sciences from the University of Alabama—Huntsville in the fall of 2000 and also from UAH his Ph.D. in Atmospheric Sciences and a MS in Computer Science in the spring of 2004.



During his dissertation research, he interacted extensively with scientists at US Naval Research laboratory in Monterey and NASA Goddard Space Flight Center. Upon graduation, he worked as a UCAR visiting scientist at the NRL Marine Meteorology Division in the Aerosol and Radiation Section. Also while in Monterey, he served as a lecturer at California State University at Monterey Bay as well as interacted extensively with students at the Naval Postgraduate School. Jianglong was hired at UND in September 2007 and is currently an Associate Professor.

Jianglong is married and has two children, Gordon, 7 and Ranae, 3.

He received the prestigious NOAA David S. Johnson Award, which recognizes young scientists for their innovative use of environmental satellite data in 2012. In 2009, he received the Presidential Early Career Award for Scientists and Engineers as one of America's top 100 young scientists.

Jianglong is currently leading the Center for Regional Climate Studies at UND.

96TH AMERICAN METEOROLOGICAL SOCIETY ANNUAL MEETING, STUDENT CONFERENCE AND CAREER FAIR

The 96th Annual Meeting of the American Meteorological Society was held January 10 – 14, 2016 in New Orleans, LA. The Atmospheric Sciences department had a table at the Career Fair which is intended to facilitate the networking process for both applicants and recruiters. There was a good turnout and we had many prospective graduate students stopping by the table. Those attending from UND were: Staff members **Morgan (Mac) Simms** and **Wanda Seyler**; Graduate Students **Travis Toth**, **Joshua Markel**, **Andrea Neumann**, **Wenjun Cui**, **Karen Larson Keith**, and **Grant Gutierrez**. **Nick Gapp**, an undergraduate student and president of the UND AMS student chapter also attended. Recent AtSc graduates also attending were **Johnathan Metz**, **Stephanie Waldref**, **Timm Uhlmann**, **Cody Troop**, **Scott Rowe**, **Kurtis Pinkney**, **Kim Bestul** and MS graduate **Joel Siegel** and former student **Melissa Becker Dye**.

Posters or talks were presented by the following people: **Travis Toth**, PhD Candidate, presented a poster

titled “*Assessing CALIPSO Version 4 Attenuated Backscatter 532 nm Calibration with NASA LaRC Airborne High Spectral Resolution Lidar Measurements*”; **Joshua Markel**, M.S. Graduate Student, presented a poster titled “*Convective Simulations Using A WRF Microphysics Ensemble*”; **Wenjun Cui**, M.S. Graduate Student gave a presentation titled “*Comparison of GPCP IDD Precipitation Product with NEXRAD Q2 Precipitation Estimates over the CONUS*”; and **Andrea Neumann**, PhD Candidate gave a presentation titled “*Evaporation of Melting Ice Particles within a Melting Layer Model*”.

Congratulations to **Travis Toth** for winning the best poster award (second place in the graduate division with over 190 posters) for the 2016 AMS student conference. And congratulations to **Josh Markel** for winning 2nd place in the Poster Presentation Category - Student Competition. He presented the poster at the 6th Transition of Research to Operations Conference.



Front on floor: Timm Uhlmann and Cody Troop; **Middle row:** Wanda Seyler, Nick Gapp, Stephanie Waldref, Kim Bestul, Andrea Neumann, Aaron Scott and Wenjun Cui;
Back row: Mac Simms, Johnathan Metz, Kurtis Pinkney, Grant Gutierrez, Joel Siegel, Travis Toth, and Joshua Markel;

27th Annual Awards & Scholarship Banquet

The 27th Annual Awards & Scholarship Banquet was held on April 29, 2016 at the Memorial Union. The guest speaker was **Tom Szymanski**, Meteorologist at KFGO Radio in Fargo, ND. Special guests were John D. Odegard School of Aerospace Associate Dean **Paul Lindseth**, Former AtSc Instructor **Pat Hurley** and Meteorologist-in-Charge at the GF NWS **Ryan & Stephanie Knutsvig**.

The UND AMS Student Chapter presented the following awards to the faculty: *Best Freshman & Sophomore Professor* – **Andrea Neumann**, a Ph.D. candidate; *Best Junior & Senior Professor* – **Dr. Aaron Kennedy** ; *Best Academic Advisor* – **Fred Remer**; *Golden Reamer Award* – **Dr. Tony Grainger**, Professor Emeritus; *7-Eleven / Most Available Professor* – **Gretchen Mullendore**; *Department Powerhouse* - **Al Borho** and **Wanda Seyler**; *Lifetime Achievement* - **Mary Ann Gregoire**.

The following awards were presented to the following undergraduates: *Outstanding Service to the Department* – **Nicholas Gapp**; *Outstanding Undergraduate Teaching Assistant* – **Lucas Sterzinger**; *Outstanding Undergraduate Student Researcher* – **Ryan Patnaude**; *Outstanding Student Broadcaster* – **Emily Pogatshnik**; *Outstanding Sophomore* – **John D. Odegard Aerospace Sciences Scholarship** – **Jonathan**

Rosencrans; *Outstanding Junior* – **John D. Odegard Aerospace Sciences Scholarship** – **Janelle Hakala**; *Outstanding Freshman* – **Taren Braunberger**; *Outstanding Graduating Senior* – **Brendan Farmer and Brittany Tague**.

The *Science Engineering Associates Scholarship* was presented to **Lance Wilson and Blake Sorenson**; the *Carlton Bjerkaas Atmospheric Sciences Scholarship* was presented to **Michaela Heeren and Kaela Lucke**.

The “*Faculty Award*” to the *Outstanding Undergraduate* was presented to B.S. senior **Nicholas Gapp** at the AtSc end-of-semester potluck in December 2015. This included a scholarship to be used for his last semester at UND.



UND-AMS Officers 2016 /17 with Advisor Al Borho

Left to Right—Al Borho, Blake Sorenson, Kaela Lucke, Tessa Philpott, Janelle Hakala, Nicole Stevens and Rebecca Anderson

UND-AMS Officers

2016 - 2017

President - Blake Sorenson
Vice President - Janelle Hakala
Secretary - Tessa Philpott
Treasurer - Kaela Lucke
Historian - Rebecca Anderson
Liaison to Undergraduate Curriculum Committee -
 Nicole Stevens

Mary Ann Retired!

After 40 years at UND with Atmospheric Sciences, Mary Ann retired on May 13, 2016. She is enjoying time with her children, five grandchildren (with one on the way), and getting used to a relaxed schedule.



Mary Ann with her cake and flowers from her children.

UND Citation Aircraft Supports the Navy CAPE2015 Project

The UND Citation II Research Aircraft, dubbed UND Cloud One, was involved with a two week mission in August 2015 over the skies of Florida. The flights were sponsored by U.S. Navy as a key element of a project called CAPE2015.

“We studied thunderstorm anvils, sampling the clouds up to an altitude of 40,000 ft,” said David Delene, associate research professor and principal investigator on this mission.

The storm cloud sampling was done concurrently with one of the most advanced radars systems in the world, the Navy's Mid-Course Doppler Radar.

Those involved with the project from UND were Wayne Schindler, Pilot; Jonathan Sepulveda, co-pilot; David Delene, flight scientist, Nicholas Gapp, an AtSc B.S. undergraduate and Jamie Ekness, an AtSc M.S. graduate student.

American Geophysical Union

The 48th annual American Geophysical Union (AGU) Fall Meeting was held December 14-18, 2015 in San Francisco. Those attending from UND were: Faculty members – **Dr. Gretchen Mullendore**, **Dr. Jianglong Zhang**, and **Dr. Xiquan Dong**; Graduate Students – **Erica Dolinar**, **Jingjing Tian**, **Yiyi Huang**, **Ted McHardy**, and **Jared Marquis**.

Posters or talks were presented by the following people: **Jingjing Tian** gave an oral presentation titled “*Retrievals of Ice Cloud Microphysical Properties of Deep Convective Systems using Radar Measurements*”; **Yiyi Huang** gave an oral presentation titled “*Quantifying the Uncertainties of Reanalyzed Arctic Cloud-radiation Properties Using Satellite-surface Observations*”; **Erica Dolinar** gave an oral presentation titled “*Calculating clear-sky radiative heating rates using the Fu-Liou RTM with inputs from observed and reanalyzed profiles*”; **Jared Marquis** pre-

sented a poster titled “*Optically-Thin Cirrus Cloud Radiance Bias in Satellite Radiometric Sea Surface Temperature Retrieval*”; **Ted McHardy** presented a poster titled “*Nighttime Aerosol Optical Thickness Retrievals Via the VIIRS Day/Night Band and the Effects of Lunar Contamination*”; **Dr. Gretchen Mullendore** presented with others at a Town Hall meeting titled “*Big Weather Web: Big Data Solutions in Support of Weather Prediction for University Research and Education*” and was one of the leaders for the community discussion. **Dr. Jianglong Zhang** presented a poster titled “*From OLS to VIIRS, an overview of nighttime satellite aerosol retrievals using artificial light sources*” and chaired two oral sessions; **Dr. Xiquan Dong** presented a poster titled “*Investigation of the Marine Boundary Layer Cloud and CCN Properties under Coupled and Decoupled Conditions over the Azores*” and chaired an oral session.

IPHEX Field Project

During May and June, 2014, the Department of Atmospheric Sciences operated its Cessna Citation research aircraft in support of the NASA participation in the Integrated Precipitation and Hydrology Experiment (IPHEX). In this campaign, the Citation was based in Asheville, NC. The aircraft took measurements of the microphysical properties of precipitating cloud systems over complex terrain and out over the Atlantic Ocean in coordination with the NASA ER-2 aircraft. The ER-2 flew above these cloud systems with a suite of remote sensing instruments, acting as a proxy for the GPM core satellite platform. A variety of ground-based instruments such as radars, disdrometers, and rain gauges were also deployed in several watersheds in the study area.



The Citation was flown by Wayne Schindler and Jonathan Sepulveda, and the instruments were operated by grad students Joe O'Brien and Katelyn Barber. The flight scientist seat was filled by Mike Poellot, David Delene, and Prof. Emeritus Tony Grainger, who was coaxed out of retirement to help out. The scenery was beautiful, the weather cooperated, and the food was excellent. A good time was had by all!



OLYMPEX Field Project



From Left to Right: Joe O'Brien, Jonathan Sepulveda, Andrea Neumann, David Delene and Rik Luytjes with the UND Cessna Citation.

The OLYMPEX (Olympic Mountains Ground Validation Experiment) field campaign took place from November 8—December 22, 2015 on the Olympic Peninsula in the Pacific Northwest of the United States. The field campaign provided ground-based validation support of the findings resulting from a new satellite that is to be launched as a joint effort between the NASA Global Precipitation Measurement (GPM) program and the NASDA space agency of Japan.

Those taking part in the project were Jonathan Sepulveda, pilot, PhD graduate student Andrea Neumann, MS graduate student Joe O'Brien, co-pilots Joe Moen, UND and Rik Luytjes, Florida; Tony Grainger, David Delene and Mike Poellot.

Department News

Ron Stenz, Ph.D. candidate in Atmospheric Sciences, from Somers, NY, has been selected to receive the prestigious Blue Waters Graduate Fellowship for the school year 2016-2017. Sponsored by the National Science Foundation, the award includes a stipend, a tuition allowance and an allocation of 50,000 node hours - equivalent to 800,000 core hours.

Ron will be harnessing Blue Waters to simulate and analyze the heretofore neglected process of precipitation centrifuging and its impacts on tornado dynamics within supercell thunderstorms. Blue Waters, built by Cray, Inc, is the fastest supercomputer on a university campus, making up to 13 quadrillion calculations per second, and possessing hundreds of thousands of computing cores. This computing power enables Ron to improve the resolution of the tornado and clarify the behavior over many separate tornado events.

Blue Waters was designed to tackle the most compute-intensive, memory-intensive, and data-intensive science and engineering problems. To see highlights of recent research problems, see <https://bluwaters.ncsa.illinois.edu>

Ron's advisor is Dr. Matt Gilmore.

Tim See, M.S. in Atmospheric Sciences graduate student from York Haven, PA, has received a research funding award for the spring 2016 semester from the North Dakota Space Grant Consortium (NDSGC). The main objective of the NDSCG is to provide and support opportunities for our students to pursue research in science, technology, engineering, and mathematics (STEM) fields and prepare them for careers that support NASA's goals and the high-tech workforce development needs of North Dakota. Tim's advisor is Dr. Gretchen Mullendore.

Nick Gapp, from Fargo, ND and **Blake Sorenson**, from Fisher, MN, Atmospheric Sciences undergraduate majors, have been awarded internships by the Department of Navy for summer 2016. They will be working at the Naval Research Laboratory in Monterey, California as part of the Naval Research Enterprise Internship Program (NREIP).

The goals of NREIP are to encourage participating students to pursue science and engineering careers, to further education via mentoring by laboratory personnel and their participation in research, and to make them aware of DoN research and technology efforts, which can lead to employment within the DoN.

NREIP provides competitive research internships to approximately 475 college students (400 undergraduate students and 75 graduate students) each year. Participating students spend ten weeks during the summer conducting research at approximately 29 DoN laboratories.



“Blue shirt day” - Tony Grainger,
Fred Remer and Mike Poellot -

February 2016

Travis Toth, Ph.D. candidate in Atmospheric Sciences, from Ambler, PA, was one of the recipients chosen for the prestigious NASA Earth and Space Science Fellowship (NASA-ESSF). The NASA-ESSF award includes yearly support of \$30,000 for up to three years, and this award is very competitive nationally.

NASA received a total of 767 applications in 2016 to the NASA Earth and Space Science (NESSF) Fellowship Program announced in November 2015 among Earth Science Research, Heliophysics Research, Planetary Science Research, and Astrophysics Research – the four research programs of the Science Mission Directorate (SMD) at NASA Headquarters.

These four SMD science divisions make respective selection of applications for award on a competitive basis. Criteria for evaluation included: (a)

the scientific merit of the proposed research; (b) the relevance of the proposed research to NASA's objectives in Earth or space science; and (c) academic excellence based upon an applicant's transcripts, the letter of recommendation by the student's academic advisor, and the degree to which it supported the proposed research.

The purpose of the NESSF is to ensure continued training of a highly qualified workforce in disciplines required to achieve NASA's scientific goals. Awards resulting from the competitive selection are made in the form of training grants to the respective universities and educational institutions, with the faculty advisor serving as the principal investigator.

Travis' advisor is Dr. Jianglong Zhang.



UND Alumni and a staff member at the NCHC Frozen Faceoff in Minneapolis on March 18 & 19, 2016 watching UND Men's hockey team - M.S. Graduate **Ed Townsend**, NWS, Fairbanks, Alaska; **Wanda Seyler**, AtSc Administrative Secretary at UND; and M.S. Graduate **Amanda (Homann) Lee**, NWS, Indianapolis, Indiana but just recently transferred to the Grand Forks NWS office.

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: seyler@atmos.und.edu.

ALUMNI NEWS

Ryan Knutsvig is a native of Buxton, ND and received his B.S. in 1997 and M.S. in 2002 in Atmospheric Science. Ryan started his career at UND, working for RWIC before moving over to Meridian Environmental Technology from 1998 to 2002. In 2002, Ryan started working for the National Weather Service in Brownsville, TX. His career led him to Riverton, WY and Aberdeen, SD as a forecaster before moving to Elko, NV as the Science and Operations Officer in 2007. Ryan took a Meteorologist in Charge (MIC) position at the North Platte, NE office in March of 2012 and finally moved back to his roots in Grand Forks as the MIC in September of 2014. As the MIC in Grand Forks, Ryan carries full managerial, supervisory, and technical responsibility for the provision of weather warning, forecast, services, and support activities for the Grand Forks National Weather Service Forecast Office serving eastern North Dakota and northwestern Minnesota.



Ryan has experienced a variety of weather during his career, which includes “wind chasing” extreme downslope winds in the lee of the Ruby Mountains in Nevada and having his roof replaced twice due to golf ball to tennis ball size hail while living in Nebraska (see photo below). Also, two tornadoes came within two miles of the NWS office in North Platte while he was working severe weather. However, the most significant weather he’s experienced was Blizzard Hannah and the Flood of ’97 in the Grand Forks area. He was evacuated from his home during the flood and was able to help with the recovery efforts following the disaster.

Ryan and his wife, Steph, have two children, Caden (14) and Kannon (12). He is a fan of UND sports and especially likes following the hockey and football teams. He is also an avid Minnesota Vikings fan and looks forward to attending both UND and Vikings games.



ALUMNI NEWS

Alex Zarnowski, from Hendersonville, NC, received his Bachelors of Science in Meteorology in 2009 from the University of North Carolina at Charlotte. He received his Masters of Science in Atmospheric Sciences in 2013 from the University of North Dakota.



In January 2013 I started my career working as a meteorologist for the North Carolina Division of Air Quality. By working within the Air Quality Analysis Branch (AQAB) I acquired knowledge in National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) attainment modeling. The types of dispersion and photochemical models I have been trained and become proficient using include AERMOD, CALPUFF, and CAMx.

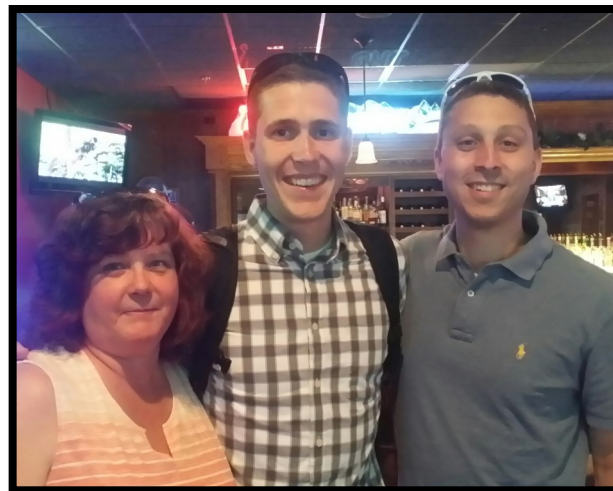
In January 2016 I started working with the North Carolina Energy Group as an Energy Policy Analyst. My work has focused on renewable energy, nuclear energy, on/offshore energy exploration, utility infrastructure, and energy assurance. As a member of the Energy Group I have worked closely with the North Carolina Energy Policy Council lead by North Carolina's Lieutenant Governor.

In his spare time he enjoys working out, fishing, wakeboarding, snowboarding, playing golf, and hiking.

Justin Weber, a B.S. 2013 AtSc graduate, from Hartford, Wisconsin, received his M.S. degree from the University of Wisconsin in Madison in 2015. After graduating from UWM he entered St. Francis de Sales Seminary to study for the Roman Catholic priesthood. The spring of 2016 he was chosen to continue formation at the Pontifical North American College in Rome, Italy. He left the beginning of July where he will begin studying in Rome for five years returning to his home in Wisconsin during the summers for parish work.

He had been thinking about applying to seminary since the summer before senior year at UND. After finishing his master's degree, he decided to apply to seminary rather than continue onto the PhD program. He is thankful for his years at UND and will cherish those memories!

Justin made a quick trip to Grand Forks before leaving for Italy the end of June.



Wanda Seyler, Justin Weber and Travis Toth,
Current PhD Student

DEPARTMENT OF ATMOSPHERIC SCIENCES

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.

We all know that most students struggle to meet the financial obligations associated with obtaining a college degree. Our goal is to establish an Alumni Scholarship fund that would provide assistance to qualifying students. The hope is to build up an endowment of \$25,000 that would generate an annual scholarship award.

If you are able to help, please contact myself or Josh Christianson. Our contact information is listed below. Your support is greatly appreciated.

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