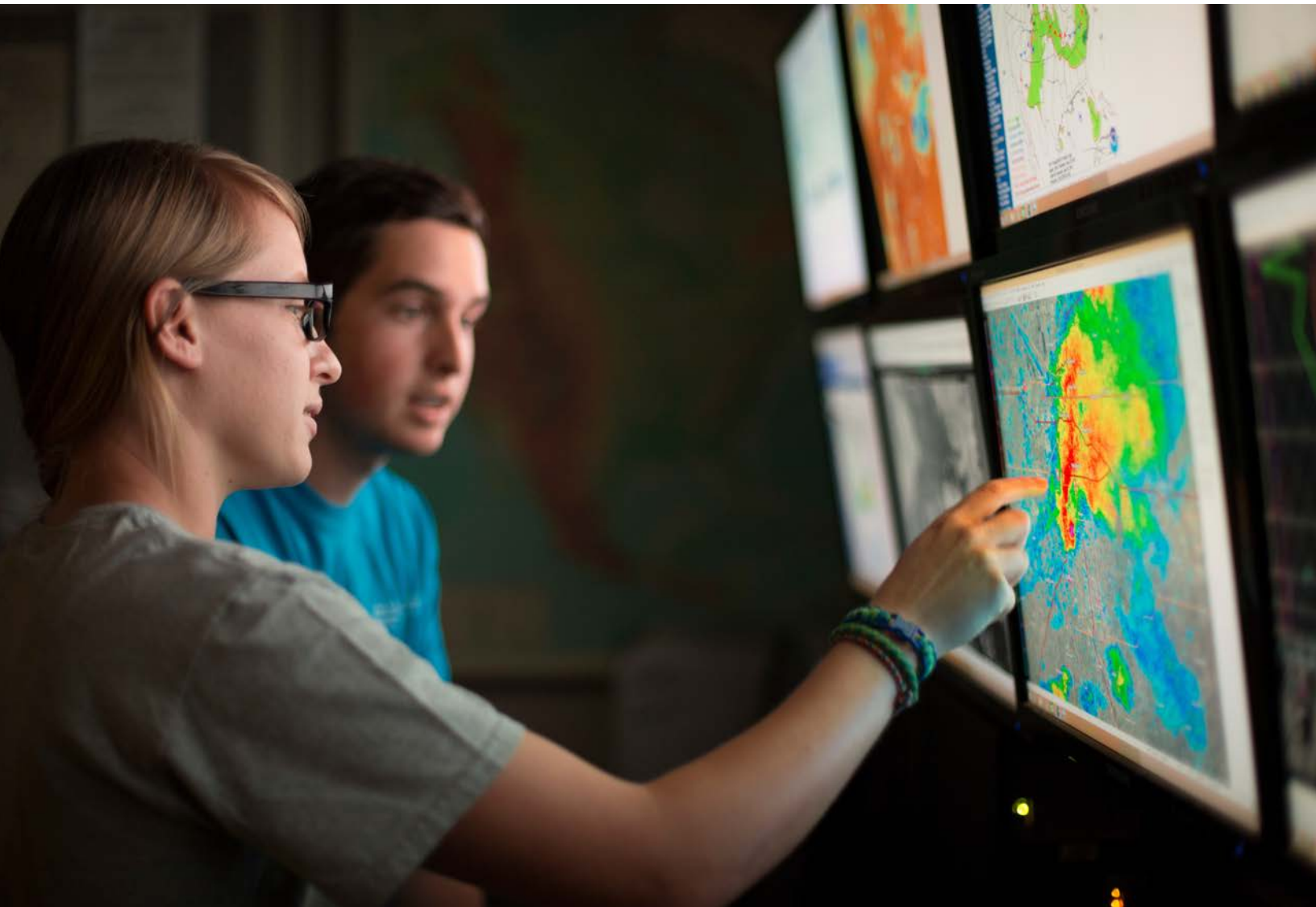


Cyclone

Atmospheric Sciences

Fall 2017

Keeping in touch with alumni, students, friends and faculty of the
Department of Geological and Atmospheric Sciences



IOWA STATE UNIVERSITY
College of Liberal Arts and Sciences

American Meteorological Society award



The department's student chapter of the American Meteorological Society was once again named Outstanding Student Chapter of the Year by the national organization. This is the fifth time the chapter has received the award (2005-2006, 2009-2010, 2011-2012, and 2012-2013, and 2016-2017). They were recognized for "innovative efforts to support membership and member growth and for helping the community through educational outreach, fundraising, and events for K-12 students". They will receive the award at the 98th AMS Annual Meeting in Austin, Texas in January, 2018. They are truly an outstanding group of students and deserve to be recognized. Congratulations students!



Cyclone

Cyclone is published once a year for the alumni, friends, and faculty of the Department of Geological and Atmospheric Sciences at Iowa State University, a department in the College of Liberal Arts and Sciences.

PROFESSOR-IN-CHARGE

Kristie Franz

DEPARTMENT CHAIR

Sven Morgan

EDITOR

David Flory

Please send news about yourself and your family for next year's Cyclone to meteorology@iastate.edu

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ON THE COVER

RECRUITING TOOL: This image, with the caption "Finding the dangerous tornado in a supercell thunderstorm – this could be you! Let's go Study Meteorology!", is currently being used on a recruiting postcard sent to prospective students who scheduled an Experience Iowa State (EIS) or daily visit with the meteorology program. With declining numbers of meteorology students nationwide, increased recruiting efforts are essential to bringing the top students to ISU.

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CONTENTS

Greetings from the Department	4
Adam Clark Awarded LAS Young Alumnus.....	5
Student Update	6
Classroom upgrade	7
2016-2017 Peer Mentors	7
IMAGINE grant	7
Dave Flory recognized with two prestigious awards...	8
Ellen Wagener painting donated to the department ...	8
Weather graphics machine upgrade to Max.....	8
Alumni Focus	9
Faculty Update	11
Student Awards, Scholarships,	20
Internships – 2016-2017	

Don't miss it!

•

• **Annual ISU Meteorology** •

• **Alumni Luncheon** •

• **March 24, 2018** •

• **11:30 a.m.-1 p.m.** •

• Courtyard by Marriott •

• Ankeny, IA •

•

In Memorium

Linda Mudoni (M.S., 2005)

William Schroeder (B.S., 1999)

Greetings from the Department



Kristie Franz



Sven Morgan

Greetings Meteorology Program Alumni and Friends,

Welcome to the 2017-2018 edition of the *Cyclone*. First I want to apologize that we did not reach out through our newsletter last year. There have been a number of changes among our faculty and staff, and unfortunately sometimes it is difficult to get everything done. We will do a better job in the future to keep our lines of communication open to you all. Given our one year newsletter hiatus, there will be lots to fill you in on.

The meteorology program is doing well and excellence among our students and faculty remains a top focus. ISU's enrollment remains strong with 36,321 students in Fall 2017. Current enrollments in the Meteorology Program are 77 majors at the undergraduate level and 13 majors at the graduate level. Our undergraduate AMS chapter continues to be a highlight of our program. Although the faculty know we have the best AMS club every year, we were excited to find out recently that ISU won AMS Student Chapter of the Year for 2016-2017! This is a well-deserved recognition of all their hard work and dedication. You can read all about recent AMS activities in the article written by Kris Tuftedal, the 2016-2017 ISU AMS Chapter president. Please check out the list of other awards, scholarships and internships received by our students this past year, it is located on the back cover of this newsletter.

One of the biggest change the program has experienced in the past couple years occurred in January 2016 when Bill Gutowski was promoted to Associate Dean for Research and Graduate Studies in the College of Liberal Arts and Sciences. This was both good and bad news. We were very happy that Bill was given this opportunity and his selection for the position solidifies what we already knew, that he has achieved great things in research and teaching and has a wonderful vision for where research is headed at ISU and beyond. We are proud that one of our faculty is helping lead LAS into the future. Although Bill maintains an active presence in Meteorology through his research program and general participation, his move meant he would no longer be teaching.

To help keep us up and running, we hired Dr. Rachindra Mawalagedara in Fall 2016 for a 2-year lecturer position. Rachindra came to us from the University of Nebraska, Lincoln where she was a postdoctoral fellow at the Water for Food Institute. She is teaching and helping out with undergraduate

advising. Please read all about Rachindra in her introduction. We are very happy to have Rachindra with us.

In addition to losing Bill in part, Dave Flory spent the last two years as a ¼-time Learning Community Faculty Fellow through the Provost's Office. The ¼ time meant that a portion of his time was now devoted elsewhere outside the program (but with Dave it tended to be that he just worked ¼ time more). We are glad Dave enjoyed his experience with the Provost's Office, but we are happy to have him back with us 100% next year.

Many of you likely know Melissa Stolt. She was the Administrative Assistant who worked in the Agronomy Student Services office helping undergraduate students. Last summer she took position in the Graduate College and we were left wondering how we would cover this need. Nicole Shimp was hired in November and has taken over much of Melissa's role in Meteorology.

Finally, you will see a new name under Department Chair. Bill Simpkins stepped down as of August 15th and Dr. Sven Morgan is our new Chair. Sven was hired after the department conducted an external search this past spring. Sven's area of expertise is structural geology and tectonics and he moves here from Central Michigan University. We look forward to working with him over the coming years to continue to improve and grow the Meteorology Program.

As always, we appreciate your continued interest and involvement in the ISU Meteorology Program. We were astounded that about 45 people (half alumni) attended the student organized alumni dinner at the Annual AMS Meeting in Seattle. What an incredible turn out! We also had a good turn-out at the National Weather Association (NWA) Severe Storms and Doppler Radar conference luncheon in April. We hope that even more of you can join us in these activities in the years to come. We also love to hear from you, so please be sure to keep in touch and drop by and visit us in the Agronomy Building the next time you are on campus. Send any messages or updates to Kristie Franz, Professor-in-Charge, by regular mail or by email (kfranz@iastate.edu).

I hope you enjoy this edition of the *Cyclone*.
Kristie Franz, Professor-in-Charge (2013 - present)
Sven Morgan, Department Chair (2017 - present)

Adam Clark Awarded LAS Young Alumnus



Adam Clark, alum of the meteorology program (BS 2003, MS 2006, PhD 2009), will receive the LAS Young Alumnus Award in October. It is the first time anyone in the physical sciences has won that award at Iowa State University. It is awarded annually to alumni of the College of Liberal Arts and Sciences who are under 40 years of age and who have excelled in their professions and provided service to their communities.

During the spring, National Severe Storms Laboratory Research Scientist Adam Clark is usually in the NOAA Hazardous Weather Testbed. In fact, he has been a lead planner and facilitator of this groundbreaking experiment since 2010.

Meteorologist, research scientist, amateur storm chaser, award winner, journal editor, mentor, and advisor – Clark never misses an opportunity to help advance the science behind severe weather prediction and forecasting.

Clark will be honored by Iowa State University with the Iowa State College of Liberal Arts and Sciences Young Alumnus Award in an awards ceremony this fall.

Past awardees graduated with degrees in advertising, political science, English, journalism, Spanish and zoology. Clark received a doctorate in meteorology from Iowa State University in 2009 and started working at NSSL that year.

“Not only did I get a rock solid education in meteorology, but while I was still working towards my PhD, my advisor, Dr. Bill Gallus helped connect me with researchers in Norman, Oklahoma, who provided me with some of the datasets I used for my dissertation,” Clark said. “That connection helped me land a post-doc at the National Severe Storms Laboratory after I finished in 2009.”

Although Clark’s research has national benefits to public safety, he also tries to focus on impacts he can make right at home and in his scientific community by mentoring college students and serving as an editor for scientific journals.

In 2014, Clark received the prestigious Presidential Early Career Award for Scientists and Engineers, PECASE, joining five other winners from NSSL.

“I plan to continue growing in this position and hope to continue my research that involves helping to rapidly advance severe weather forecasting capabilities for NOAA,” Clark said. “I owe a huge debt of gratitude to all my professors at Iowa State – especially Bill Gallus for his guidance and contagious love of science that helped get me to where I am today.”

More information about the award: <https://alumni.las.iastate.edu/awards/>.

Student Update



ISU AMS students at the first meeting of the 2016-2017 academic year!

The Iowa State Chapter of the American Meteorological Society has continued to innovate, improve, and expand this past year. Although we did not get student chapter of the year, we are still grateful to be on the Chapter Honor Roll for 2015-2016. ISU AMS has worked hard on the implementation of new events, as well as improving old events to make them even more appealing to students. This hard work has paid off with record attendance at a majority of the monthly meetings during the year.

We have continued to be heavily involved in school visits, science nights, and various other community outreach events. Over the course of this academic year, we participated in 31 outreach events and reached out to over 2,000 kids in the effort to encourage careers in STEM fields. In addition to the numerous school visits, ISU AMS continues to be involved with Taking the Road Less Traveled, which is a program that encourages young women to explore careers in science.

In addition to continuing the success of our outreach events, ISU AMS has also been very invested in helping students with professional development. Cy's Eyes on the Skies continues to be a great opportunity for aspiring broadcast meteorologists to practice and refine skills necessary for their potential future career. Another great opportunity that our members took part in was the 97th AMS Annual Meeting in Seattle. We had a record attendance of 23 ISU AMS members at the meeting. AMS also continues to have a strong relationship with the Central Iowa National Weather Association and the National

Weather Service office in Des Moines, as other great ways for our members to get acquainted with professionals in the field.

ISU AMS has added numerous social events and continued previous favorites. Many events get fantastic turnouts, including our annual bonfire, student/faculty dinners, corn maze visit, student picnics, and our new ISU AMS Severe Weather Week, which involves events like a radar seminar and a storm chasing simulation. The ISU chapter loves the idea of tradition for these events, and also hopes that some of these new events will become traditions for future students.

This year, ISU AMS will be holding its third annual science fair for elementary aged children. Last year's attendance more than tripled the first year's attendance, and we hope to attract an even larger group of students this year. We will be working with other science based student organizations across campus to make the science fair even larger and more inclusive.

Also, as a thank you to our wonderful faculty, we will continue our Faculty Appreciation Day. This event allows students to eat pizza with faculty members, as well as hold conversations with them while celebrating all they do to help us succeed.

The Iowa State University Student Chapter of the American Meteorological Society grows more and more each year and will continue to work tirelessly to ensure that we uphold that standard for years to come.

Classroom upgrade



Our primary classroom received an upgrade this past summer using funds from the LAS Computer Advisory Committee. The upgrade includes a new HD, high-lumen projector; state of the art switching/scaling and audio electronics; a new media controller for switching between input sources; and, my favorite part of the upgrade, two 40" LED flat-panel displays mounted toward the back of the room. The flat-panel displays increase screen visibility for those sitting toward the back. Students will use the new setup for the first time during the fall 2017 semester.

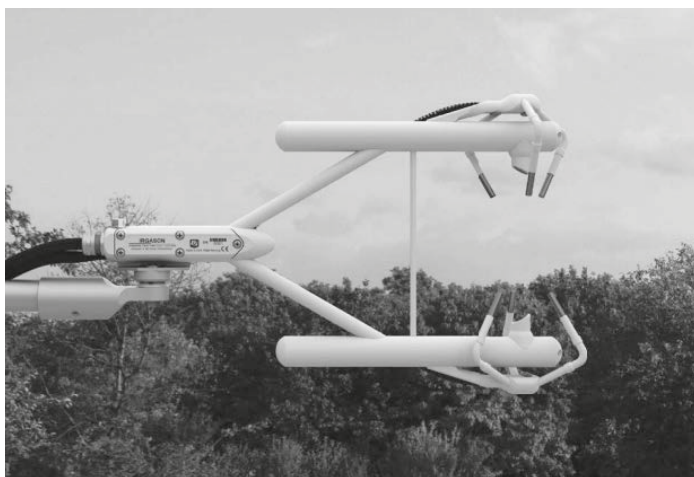
2016-2017 Peer Mentors



BACK ROW (left to right): Theodore Hartman, Justin Covert, Zane Satre
FRONT ROW (left to right): Nurul (Hannah) Ahmad Ridzuan, Kerry Blodgett, Caitlin Cervac

The US News and World report identifies Iowa State's learning communities among the top 25 programs in the nation. The department's Earth, Wind & Fire learning community serves students interested in majoring in meteorology, geology, or earth science. Coordinated by Mr. Dave Flory and Dr. Cinzia Cervato, the goal of the non-residential, peer mentor led learning community is to help freshmen and transfer students' successfully transition to college life. Peer mentors are the foundation of our learning community. Each student in the learning community is assigned a peer mentor, usually juniors or seniors in their respective programs. Peer mentors are responsible for leading our learning community connection classes, meeting individually with their students as needed, coordinating social activities and team building exercises, and participating in our pre-semester kick-off field trip the weekend before classes start. Our learning community is currently in its 15th year and is viewed as an exemplary community on campus.

IMAGINE grant



In early 2017, Dave Flory received a \$24,000 Campbell Scientific IMAGINE grant. The purpose of the grant is to enhance students' understanding of measurement concepts through education. With a \$6,000 match from the department, the program was able to add several new instruments to our instrumentation collection that would have otherwise been out of reach. Some of the instruments purchased include a Campbell Scientific IRGASON integrated CO₂ and H₂O open-path gas analyzer and 3-D sonic anemometer; state-of-the-art Campbell CR-6 universal terminal data loggers; and several 12cm water content reflectometers. Plans are to incorporate all of the instruments into to our instrumentation and measurement course (Mteor 432).



Dave Flory recognized with two prestigious awards



Dave Flory was recently recognized with two awards at the 2017 Iowa State University Faculty and Staff Awards Ceremony. Mr. Flory received the Iowa State University Award for Outstanding Achievement in Teaching and the Louis Thompson Distinguished Undergraduate Teaching Award. The former recognizes a faculty member for outstanding teaching performance over an extended period of time while the latter is a special designation recognizing an outstanding teacher who is dedicated to helping undergraduate students.

Ellen Wagener painting donated to the department



Ellen Wagener was born in Maquoketa, Iowa, and grew up in nearby DeWitt. She received her B.F.A. from the Corcoran School of Art in Washington, D.C. in 1989. She worked and taught in Iowa for many years and now resides in Arizona. Her work has been featured in solo exhibitions at the Brunner Art Museum at Iowa State University, University of Arizona Museum of Art, Tucson Museum of Art, U.S. Art in Embassies, U.S. Capital Rotunda and in group exhibitions across the country. Her work is in numerous public and private collections, including the Figge Art Museum, University of Iowa, Iowa State University, Cedar Rapids Museum of Art, University of Arizona, Scottsdale Museum of Contemporary Art and the Dubuque Museum of Art. She has completed commissioned works for the U.S. 9th District Federal Courthouse in Cedar Rapids and the Phoenix Office of Arts and Culture, and has received numerous awards, including a grant from the Louis Comfort Tiffany Foundation in 2007.

Wagener takes the quintessential Midwestern landscape – rows of corn receding to the horizon under ever-changing skies – as the starting point for her works. Working in pastel, and often in series and at large scale, Wagener uses sketches, photographs and her memory to create vivid evocations of particular weather patterns and times of day.

Dr. Gallus was contacted by Brunner Art Museum and asked to give a public talk related to Ms. Wagener's exhibition there and to meet the artist. Ms. Wagener enjoyed the conversation about severe storms and their beauty so much that she surprised the program by donating one of her pastels of a tornado to the program in honor of Dr. Gallus. If you come to visit us, you can see this beautiful work displayed by the elevator on the third floor.

Weather graphics machine upgrade to Max Cirrus



This summer we completed installation of our new weather graphics system used by Cy's Eyes on the Skies (CEOTS) and more generally by students interested in broadcast meteorology. Cy's Eyes is a student-run, weather broadcast that airs twice a week on ISUtv. The Weather Company, formally WSI Max Cirrus platform is currently in place in the

studio in Hamilton Hall and several students received training the week before classes started this fall. The upgrade will provide the opportunity for our students to become proficient with building weather graphics with the system and continue to serve as an additional selling point for the meteorology program in attracting prospective students.

Alumni Focus

Want to share your story and be featured in upcoming versions of our Alumni Focus? If so, please contact Dave Flory (flory@iastate.edu).

Jesse Ritka (Wartman) (BS, 2007)



Jesse Ritka is the 4pm & 6pm meteorologist for the Milwaukee NBC affiliate, WTMJ. As a self-proclaimed “weather nerd” she uses her forecasts to help bring science into homes every evening. She loves academic outreach and gets to highlight atmospheric principles and processes in a daily segment called the “Geek Out”. Ritka also enjoys taking the TODAY’S TMJ4 Storm Chaser Out during severe storms and winter weather to show exactly what weather is occurring. Jesse, her husband Jason and son Jaxton just welcomed another boy, Asher, into their family.

Eric Aligo (MS, 2004; Ph.D., 2011)



Eric is currently working for NCEP (National Centers for Environmental Prediction)/EMC (Environmental Modeling Center) in College Park, MD. Over the last several years he helped modify the operational NCEP NAM (North American Mesoscale Model) microphysics scheme to improve warm season convective storm structure. The Ferrier-Aligo microphysics scheme has been running operationally in the NCEP NAM since August 2014 with an upgrade in 2017 focusing on reducing a high bias in heavy rainfall.

Tina Greenfield (BS, 2002; MS, 2004)



I am the road weather information coordinator for the Iowa DOT; focusing specifically on winter operations. Much of what I do for the Department is in analytics – measuring our effectiveness and resource usage in response to winter storms. Since every storm is different, this involves handling a lot of weather data to find the underlying patterns. I also manage our sources of road weather data. We have nearly 70 roadside weather stations that we use to monitor current conditions and archive for analysis, plus a weather forecasting contract service that provides vital road weather predictions tailored to our winter maintenance needs.



David Kochevar (BS, 2007)



Currently I'm working at the Anchorage Forecast Office where I have worked as a Meteorologist since 2012 and was recently promoted to Lead Meteorologist. The Anchorage WFO provides forecast and warning services for an extremely large area including the Southern Mainland of Alaska, Gulf of Alaska, Bering Sea, and Aleutian Islands. One of the favorite roles I have had at the Anchorage WFO has been to be a forecaster trainer, where I get help new Meteorologist learn how to work in what is a very challenging Alaskan forecasting environment. I am also the Aviation Program Manager where I train forecasters, work with the aviation community, and study ways to improve operations for the 17 airports we service with a Terminal Aerodrome Forecast (TAF). I am also involved in the NWS Organizational Culture Team, where we are working to improve the culture of the NWS as the agency evolves and builds a Weather-Ready Nation. Outside of work, I am an avid cross country skier, hiker, and backpacker, and continue to be involved in music through the Eagle River-Chugiak community band where I play Baritone.

Faculty Update

Jim Aanstoos Senior Lecturer



I continue to teach the two classes that I created in 2013: a new course in weather radar (MTEOR 435: *Radar Applications in Meteorology*) and a course in remote sensing (MTEOR 489/589: *Survey of Remote Sensing Technologies*). The

latter course is also offered online, and is cross-listed in 3 other programs: Electrical Engineering, Natural Resource and Ecology Management, and Geology. I am happy to announce that both these classes are now in the official ISU catalog as of this academic year, so no longer “experimental” courses!

I continue to be impressed with the caliber of our students. I have had the opportunity to better get to know more of them this year with my increased load in student advising, due to the sabbaticals of two members of our faculty in the fall.

Once again this year I offered a Study Abroad program that comes with credit for the remote sensing course. After not getting enough student applications to make it viable last year, we modified the format to reduce its cost. This year it combines a shorter (now 8 days) trip to England with a precursor half-



semester online course. The students stay in Guildford, England where they receive guest lectures from faculty in the Surrey Space Centre of the University of Surrey, and a tour of a satellite manufacturing facility nearby. Furthermore, the program includes visits to Stonehenge, the Greenwich Observatory, and the London Science Museum. I have led this program twice in the past through Mississippi State University and am excited to get it going here at ISU. Thanks to a generous subsidy from the College of Engineering we were able to do the program this time in spite of having only three students able to go – one from Meteorology and two from Engineering.



The overseas travel took place May 8-15 and the students had a great time and many memorable experiences, which they can now share with other students considering the program in the future.

I also continue to supervise the research of a team at Mississippi State University’s Geosystems Research Institute using synthetic aperture radar (SAR) to assess the condition of earthen levees. This research produced two journal articles and 3 refereed conference publications last year, as well as the completion of two PhD dissertations.

I continue to serve on the organizing committee for the annual IEEE Applied Imagery Pattern Recognition Workshop, but this year am taking a less demanding non-officer role after my busy time as Program Chair of the October 2015 conference. In addition, I continue as a Program Evaluator for ABET – the accrediting organization for engineering and technology programs.

Finally, I was honored last year to be nominated and accepted for membership in the prestigious Cosmos Club of Washington, D.C.



I have been involved in recent years with two major research projects: (1) the development of the afternoon thunderstorm activity in the Taipei Basin, Taiwan, during summer, and (2) the formation mechanism and development of

heavy rainfall/flood events around the South China Sea for both winter and summer. Project 1 is a research collaboration with scientists of Taiwan, while Project 2 is a joint field experiment with Southeast Asian countries and Japan. After my report of last Cyclone Statement, several significant advances have been made by these two projects. It is an exciting opportunity for me to share these interesting research results with you.

Rainfall produced by the afternoon thunderstorm (TS) in the Taipei Basin affects the water supply, air/land traffic, and pollution of this basin. Forecasts of the afternoon TS activity is a serious issue to the weather service of Taiwan. To improve forecasts of the afternoon TS occurrence, we develop a two-step hybrid forecast advisory, based on the synoptic condition around Taiwan and surface observations along two river valleys of this basin: surface pressure, temperature, dew point depression relative humidity, and land-sea breeze. Step 1 validates the 24-h forecast for the 0000UTC (0800LST) and timings for diurnal variations for these five variables on the TS days. Step 2 Validates the same synoptic and surface meteorological conditions observed on the TS days. The feasibility of this forecast advisory is successfully demonstrated by these validations.

The well-being of \approx 7-million population within the Taipei Basin and its vicinity is affected by the drought and flood condition caused by the interannual variations of TS days and rainfall. A systematic analysis was made with TS days and rainfall for two decades. We find the variation of these variables follow the Pacific-Japan Oscillation in response

to the ENSO cycle: the TS occurrence days and rainfall amounts during the cold ENSO phase are twice of those during the warm ENSO phase. Thus, we can use the ENSO prediction issued by NCEP CPC to predict the dry/wet condition over the Taipei Basin and its vicinity.

After the conclusion scientific symposium of Monsoon Asian Hydro-Atmospheric Science Research and Prediction Initiative (MAHASRI) in early March 2016, Prof. Jun Matsumoto arranged me to give a series of lectures at Tokyo University, Japan Agency for Marine-Earth Science and Technology (JAMSYEC), and Tokyo Metropolitan University. The scientific interaction with faculty members, scientists, and graduate students of these institutions led me to explore the following aspects of the South China Sea heavy rainfall/flood (HRF) events within the collaboration between EMEAX (East Asian Monsoon Experiment) and MAHASRI:

1. Formation mechanism of the SCS rainfall centers in winter and summer, and interannual variations:

Winter: A cold-season rainfall center appears the southern SCS north of the NW Bornea. Coincident with the SCS surface trough, this rainfall center is primarily formed by the interaction the cold surge flow with the SCS trough. Modulated by the interannual variation of the cyclonic shear flow along the near-equator trough in concert with the ENSO, the SCS rainfall center undergoes an interannual variation.

Summer: A NW-SE oriented summer trough exists between northern Indochina and Borea. Located ahead of this SCS trough is a convergent center west of the Philippines, which provides an environment favorable for rain-producing weather systems to produce rainfall over this center and form the SCS summer rainfall center. Following the Pacific-Japan Oscillation, the interannual variation of the monsoon westerlies leads to the interannual variation of the SCS summer rainfall center.

2. Impact of the summer monsoon westerlies on the SCS tropical cyclone genesis in May: After the onset of the southeast Asian monsoon in mid-May, the SCS trough is deepened by

the intensified monsoon westerlies to facilitate the development of a synoptic cyclonic shear. This shear flow forms an favorable for the SCS tropical storm(TS)/typhoon(TY) genesis triggered by the surge of this monsoon circulation. A four-step forecast advisory is introduced. The forecast for the SCS TS/TY genesis can be made 3 days prior to occurrence.

3. Development of forecast advisory for cold-season HRF events in the SCS: The occurrence frequency of peak intensity over the life cycles of the parent cold-surge vortices (CSVs) for HRF event is classified into two types depending on their life cycles having 2 or 3 peak intensities. The formation of an HRF event with 2 peak intensities < 5 days, but the formation of HRF event with 3 peak intensities is > 6days. The relay of the GFS forecast from the peak intensity is used to predict the formation occurrence of HRF events with 3 peak intensities.

The research results the six studies reported above are all published in J Climate, Weather and Forecasting, and J Appl Meteor and Climatology in 2016-2017.

When we explore the formation mechanism of the summer SCS rainfall center, we also find the early summer rainstorms in southern East Asia are developed from the mid-tropospheric cyclones (MTCs) originated in South and Southeast Asia. The genesis mechanism and eastward propagation properties of MTCs in these two regions are under our investigation. Hopefully, this effort will be done by this year. In fact, I also plan to write a book to summarize our research for these two regions under EAMEX and MAHMSRI in the next couple of years.

For our research group, Martin Coolidge moved on to study in a seminary. Although Sarah Fingerle was called back by the Air Force last year (2016), she came back to Iowa State this spring for the oral test of her MS thesis. Beth Callen went back to the Medical Center of KU to take up a statistical research position. Amanda Black passed her Preliminary Examination last year. She is focusing on her dissertation research. Hopefully, she will have her PhD defense in summer 2018. Kierstin Blomberg is examining the formation mechanism of the summer

rainfall center in the Northern Plains for her MS thesis. Hopefully, she will be done summer 2018. Under a temporary assignment of EAMEX, Paul Tsay went to Taiwan in the past half year.

Dave Flory Senior Lecturer



I would like start this year's statement by highlighting several improvements taking place in the program geared toward improving the undergraduate student experience. Each of these has also been included in inserts throughout this newsletter.

The College of Liberal Arts and Sciences (LAS) funded two projects this year with money collected from student computer fees. The first is an upgrade to our student computer lab/classroom (3128 Agronomy Hall). It has been a while since we have had a tech upgrade to the room, so it was definitely a welcome sight. The upgrade includes a new HD, high-lumen projector; state-of-the-art switching/scaling and audio electronics; a new media controller for switching between input sources; and, my favorite part of the upgrade, two 40" LED flat-panel displays mounted toward the back of the room. The purpose of the flat panel displays is to increase screen visibility for those sitting toward the back. Students will use the new setup for the first time during the fall 2017 semester.

The second project involves our weather graphics system used by Cy's Eyes on the Skies (CEOTS) and more generally by students interested in broadcast meteorology. Cy's Eyes is a student-run, weather broadcast that airs twice a week on ISUtv. The maintenance contract had finally come to an end on our Weather Central[®] 3D:LIVE Fusion™ system purchased in 2012. Due to the age of the equipment, renewal was not an option. Fortunately, the college agreed to fund the purchase of a Max system from The Weather Company, which includes five-years of data and maintenance. The system is currently in place in the studio in

Hamilton Hall and several students received training the week before classes started this fall. The upgrade will provide the opportunity for our students to become proficient with the most popular system in the market and continue to serve as an additional selling point for the meteorology program in attracting prospective students.

Finally, earlier this year (2017), I applied for and selected to receive a \$24,000 Campbell Scientific IMAGINE grant. The purpose of the grant is to enhance students' understanding of measurement concepts through education. With a required \$6,000 match from the department, the program was able to add several new instruments to our instrumentation collection that would have otherwise been out of reach. Some of the instruments purchased include a Campbell Scientific IRGASON integrated CO₂ and H₂O open-path gas analyzer and 3-D sonic anemometer; state-of-the-art Campbell CR-6 universal terminal data loggers; and several 12cm water content reflectometers. Plans are to incorporate all of the instruments into our instrumentation and measurement course (Mteor 432).

I would also like to mention that I was recently (April) named the 2017 recipient of the Louis Thompson Distinguished Undergraduate Teacher Award. This award recognizes faculty members for outstanding teaching performance over an extended period. The Louis Thompson designation is for awardees who show special distinction in undergraduate teaching. Recognition for the award will take place at the university awards ceremony in September. While I take pride in each of the college and learning community awards I have received over the years, I am truly humbled to receive this university recognition for my teaching. What is next? National awards? Something tells me these are going to be a bit more of a challenge. ;-)

My two-year term as Learning Community Faculty Fellow has ended, although I continue to remain very active in learning communities at the university, college, and departmental level. I also stepped down as president of the Central Iowa Chapter of the National Weather Association after a very successful 20th anniversary

conference in 2016. After taking a brief hiatus afterward, I reconnected with the chapter earlier this year.

As many of you know, Dr. Bill Simpkins has stepped down as departmental chair. An external search for a new chair was completed and Dr. Sven Morgan, most recently from Central Michigan University, has accepted the position. I would encourage you to write Dr. Morgan (meteorology@iastate.edu c/o Departmental Chair) and express what you value most about our program and the direction you would like to see it take in both the near and distant future. I strongly feel that the voices of alumni need to come through loud and clear to the new chair.

Finally, I really enjoyed reconnecting with many of you at the 2016 AMS National meeting in New Orleans. Unfortunately, I am not able to make the meeting every year and missed the last meeting in Seattle. As always, if you are in the area, please stop by the department and let us know how you are doing. Otherwise, do not hesitate to shoot us an email. I would like to start compiling a list of alumni news for future issues of the Cyclone and this statement can serve as a first step in getting that started. I have said this before, but, honestly, we never get tired of hearing from you. Oh, and one last thing, do not forget to "Like" the program's Facebook page (ISUMeteorology) and watch for our new Instagram page. Take good care.

Kristie Franz

Associate Professor



I took my first sabbatical last fall and it was a nice break from the routine. Faculty use sabbaticals in many different ways, but primarily they are an opportunity for us to get time to work on aspects of our profession for which we wouldn't

otherwise have time. I spent most of my sabbatical in Ames with a few visits with collaborators at NCAR and Colorado School of Mines. My whole

family went to Colorado for three weeks during last summer; we lived out of our travel trailer at an RV park right in the town of Golden. Although we had a fun trip, if you want to read about a little more exotic sabbatical, jump over to Bill Gallus' update – he spent his entire sabbatical in Italy (yes, I am jealous).

The goal of my sabbatical was to become more familiar with the WRF-Hydro model, which was developed at NCAR and is being applied for streamflow forecasting at the NOAA Office of Water Prediction. With a big focus of my research on forecasting, a few of my graduate students are now starting to work with this model. My former student Logan Karsten (MS Meteorology, 2011) works at NCAR for the person who developed WRF-Hydro, so it was a twist to have him be the one teaching me the basics of modeling.

My sabbatical was also a time to catch up on papers and proposal writing. Last winter, I submitted three proposals and was co-author on three published papers. Last fall was also a transition time for my family because my daughter Elia started kindergarten and my husband started his own "handyman" business. Elia loved kindergarten and my husband is keeping busy, so we have adjusted well to the changes. Max has one more year to go, and then he will also start on the journey through grade school.

After a few years of not getting any graduate students out the door, this turned out to be a boon year. Angela Bowman finished her PhD in Geology this June. We are finalizing her last paper on investigating the role of potential evapotranspiration data for streamflow modeling; it turns out that the models are not very sensitive to this data. Although for short periods of time this makes sense, Angela's work showed that even on monthly to seasonal timescales you can get by with very simple estimates of this energy flux. Tyler Madsen completed a MS in Geology/Environmental Science in June also. He explored how the accuracy of a streamflow model changes with the size of the watershed being modeled. Patrick Edmonds, who I was co-advising with Andy VanLoocke (Assistant Professor in Agricultural Meteorology), completed his MS in Meteorology in spring. Pat spent a summer collecting field data from prairie

potholes and then compared the data against a crop model to see the effect of standing water on the vegetation processes.

Contrary to what one would expect from a hydrologist, I have actually been enjoying our dry summers here in Ames. However, they have been causing some problems for grad students. Tyler had a hard time getting data for large flows to use in his study, Pat had limited pothole flooding data, and Brad Carlberg (PhD Meteorology) is finding few severe storms to investigate for his work. Brad is exploring the use of ensemble QPF (that is, precipitation forecasts) for hydrologic forecasting as part of his dissertation research. His original goal was to generate streamflow predictions in real time, but there have been few events of significance in our study watersheds over the past two years! Bill Gallus and I have been collaborating on the work Brad is conducting and were recently awarded a new grant on a similar topic. We just hired a new student named Andrew Goenner (MS Meteorology) to work on the forecasting project also. For the sake of the research, we are relieved that some parts of Iowa and Wisconsin that are seeing high streamflow activity this summer.

We wrapped up our Water and Climate Change project this past year and David Dziubanski (PhD Candidate in Civil Engineering and Geology) is finishing his research and hoping to graduate this coming spring. I joke that David has stuck it out at ISU almost as long as I have; but it is no joke that he has done some interesting work while he was here. For his dissertation research he built a socio-hydrology model of the Squaw Creek that simulates both the watershed process and changing human decisions at the same time. We are using the model to explore the impact of complex human decisions on the hydrology of Midwest watersheds and plan to get a few papers submitted this fall.

This past January I made it back to the AMS Annual Meeting after a number of years without attending. I really enjoyed running into a few of you there. Please continue to keep in touch, it is so much fun to hear about all the great things you are doing. Maybe I will see you in Austin in 2018.

William A. Gallus, Jr.

Professor

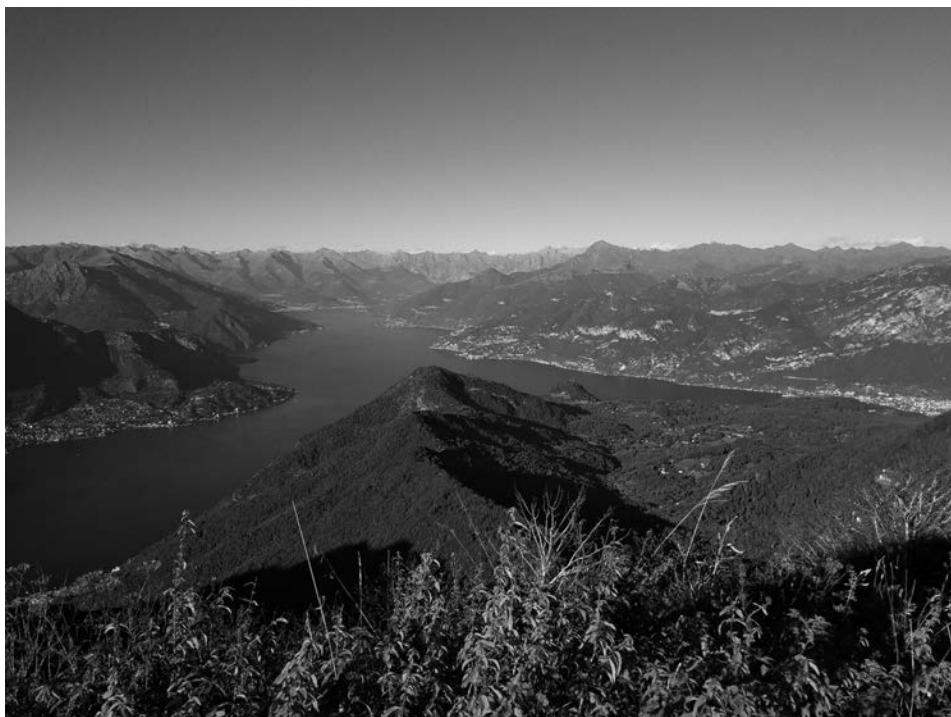


The highlight of the last two years for me was the chance to take my first sabbatical of my 22 year career at Iowa State during fall 2016. I spent four months in the Department of Physics at the University of Milan studying whether or

not the warming of the Mediterranean Sea is causing changes in the frequency and severity of both tornadoes and thunderstorm-caused flash flooding in Italy. The experience was especially nice for me because I was able to live in Lecco on incredibly beautiful Lake Como, the hometown of my family's former high school exchange student Ezio. Professionally I was able to give three seminars on severe weather at the university and two Italian science laboratories (Bologna, and Savona), one public seminar entirely in Italian at the Lions Club of the northern Milan metro area, and teach a week-long class at the request of students who had enjoyed my tornado seminar earlier in the semester. I established strong collaborations with several scientists



there, and was able to publish one paper on a historical flood event near Genoa caused by a strong MCS, submit another paper on how the frequency of these flood-inducing MCS events might change in the future using regional climate model output, and we are currently working on another paper to



submit, on one of the worst bow echo-like storms to hit Italy in modern memory, that struck in October while I was there. Because that area surrounding my adopted home town is adjacent to the Italian Alps, I was able to hike with Ezio and new Italian friends almost every week, exploring the most amazing mountain scenery I had ever seen. I also learned that in Italy, even in the most remote mountains, you can almost always find a rifugio near the peaks to grab a nice glass of wine with pasta, before crashing on a comfy bed for the night, for the tiniest fee. It is truly heaven for alpinists!

In the year leading up to the sabbatical, I taught three courses, as it was the alternate year when Mesoscale Dynamics (407/507) is taught. It was nice in that I had 17 juniors in the class, so for a change, I really got to know the junior class. Normally I don't meet many students until they are seniors. The extra teaching workload, combined with having numerous graduate students finishing their degrees and drafting journal papers, meant that I felt spring 2016 was my busiest semester ever (and made the sabbatical all the more necessary to re-charge my batteries!). One PhD student, John Lawson, defended his PhD in April 2016, and was quickly hired as a post-doc at NSSL. He examined predictability of bow echoes by focusing on very fine grid spacing ensemble simulations of

two events. David Jahn also finished that spring his wind energy-related work on modifications to the MYNN planetary boundary layer scheme to better depict wind ramp events during the stable nocturnal period, and then became a post-doc for me (my first one) looking at PECAN (Plains Elevated Convection At Night) cases and how his PBL modifications might affect wind and storm forecasts. The PECAN work was funded by a new NSF grant that I received in summer 2016. My PhD student Brian Squitieri continued his work related to MCSs, and Brian taught the synoptic course in fall 2016 while I was in Italy. Kristie Franz and I continued to work with our PhD student Brad Carlberg on a NOAA CSTAR project focused on improved QPF from high resolution WRF simulations to be used as input in hydrologic models. Kristie and I received new CSTAR funding in summer 2017 that will continue to support Brad and a new student, Andrew Goenner, who just arrived. My MS student Sean Stelten who had been supported under NSF funding related to PECAN finished his thesis in summer 2016 and took a job in the Marshall islands as a forecaster. Another PhD student of mine, Ahmad Samman, has continued his work looking at heavy rain events in his home country of Saudi Arabia. Finally, a new MS student, Nick Vertz, joined me in spring 2017 and is examining position errors in MCSs and their relationship with moisture errors in the pre-storm environment.

I was able to attend several conferences during the last two years, including the AMS Annual meetings in New Orleans in 2016 and Seattle in 2017. I greatly enjoyed seeing some of you at the alumni dinner we held in New Orleans. Sadly, my flight to Seattle was delayed over a day and I missed the alumni dinner that I was so looking forward to (especially since it was at an Italian restaurant and I wanted to see if the food brought back happy memories of my sabbatical days!) Luckily I did not miss the spring alumni luncheons held each year during the NWA Severe Storms Conference in Ankeny. Once again I participated in the Hazardous Weather Testbed Spring Experiments in Norman in May 2016 and 2017, and was able to bring a few graduate

students along. I continued to serve as chair of the Unidata Strategic Advisory Committee, enjoying a fall meeting in Boulder in fall 2015 and spring meetings in Tampa in 2016 and Madison, WI in 2017. My service on that committee will end this fall. Finally, as always, it was fun to visit with a few alumni who stopped by our building. I encourage you if you are ever in town to feel free to visit! If you let us know ahead of time, we might even try to have you give a seminar! As I got used to saying during the sabbatical, *Ci vediamo* (see you later)!

Bill Gutowski Professor



The past couple of years brought a major change in my career. I was asked (along with some others) to apply for an opening in the LAS College administrative staff, specifically for the position of Associate Dean for Research and

Graduate Education. After a review by a search committee and an interview process, I was selected. I started the position on January 1, 2016. It has been a very interesting, albeit steep, learning curve. The most interesting part has been learning about all the research that goes on across the college. With over 20 departments and programs that span the humanities, social sciences, natural sciences and mathematical disciplines, the LAS College is like a small university unto itself. I have a special interest in interdisciplinary research, as you may have noted in past years, so promoting that across such a broad college is especially attractive. I have also found very interesting my involvement in strategic planning for research for the whole university, in conjunction with the Office of the Vice President for Research and the associate deans for research in the other colleges. It has given me a view of Iowa State that I was only dimly aware of in the past.

I remain active in research in many

ways, and it is actually a stipulation of my position, if I am going to have any credibility as an associate dean for research. So, my research program continues in many ways. I now have the benefit of a research assistant, Justin Glisan, who got his PhD and a postdoctoral position with me. Justin plays a vital role in helping me keep my research projects on track. Perhaps the biggest news is that Iowa State last year received a major research award from the Department of Energy to develop a framework for evaluating climate simulations, especially their capabilities for simulating key processes involving energy, water and land use. Iowa is, of course, a leading producer of wind energy and biofuels, so the program is quite relevant to our state. The research involves simulations by global models, regional models and also output from statistical downscaling – so all the means by which the climate community produces data and ultimately information about our changing climate. Iowa State is the lead institution on the project, which also involves Ray Arritt, whom some of you may remember from your classes here. We also have partners at five other institutions: the National Center for Atmospheric Research, DOE's Pacific Northwest Laboratory, Cornell University, UCLA and Texas A&M University. The research team has many people I have long enjoyed working with, and so I have been very happy for those continued interactions in addition to the very interesting research itself.

Ongoing work includes our Water and Climate Change (WACC) project. Last year, we conducted a series of workshops with our community stakeholders in the Squaw Creek watershed. You may recall that this project involves looking at coupled hydrology and human decisions in managing a local watershed, Squaw Creek. Combining the physical modeling of water flowing over and under the surface with "agents" that make decisions on how to regulate the water has been very interesting. Squaw Creek actually runs through our campus and extends many miles upstream, encompassing farmland, recreational areas, suburban/urban land and other land uses. The community meetings

were a great opportunity to see how our agent-based watershed modeling would be received by stakeholders in the watershed and, equally important, to see how our understanding of important issues to address in our modeling would be shaped by what we learned from the stakeholders. We were able to foster an understanding of our modeling with the group while also seeing that important issues, such as tiling of farmlands, are viewed as central to understanding water resources in our study domain.

My research also continues with evaluating droughts and pluvial (high rainfall) episodes in observations and climate simulations, focussing on the region that provides water to metropolitan Denver. This work proceeds in collaboration with NCAR and Denver Water, and so is another example of how my research crosses disciplinary boundaries. My PhD student, Abayomi Abatan, has been assisting me in this effort. Abayomi successfully defended his thesis early in the summer of 2017. I have been very happy to have worked with him.

My Arctic research has also continued, assisted by my PhD student Brandon Fisel, undergraduate research assistant Kierstin Blomberg (who is now an ISU grad student) and Justin Glisan. Much effort focuses on precipitation and temperature extremes and how well our climate models can replicate reality. Generally, they do pretty well with most of the physical behavior, except that they have trouble resolving the very sharp topography across southern Alaska. The mountains there present what is essentially a wall facing the moist air flowing in off the Pacific. The finer resolution we hope computers will eventually allow will help substantially.

I'm happy to report that another student of mine, Sho Kawazoe, successfully defended his PhD thesis during summer 2016. He has since taken a very interesting postdoctoral position with the Japan Agency for Marine-Earth Science and Technology (JAMSTEC). He will be working on evaluating their fine resolution climate products and their utility for application by various sectors (e.g., water resources, agriculture, etc.). Sho

still has family in Japan, and he claims to know Japanese fairly well, though I would not be the one to judge, so this position is a great opportunity for him on a personal as well as professional level. To make the position yet more interesting, he told me that in the first few weeks after arriving, there had been four typhoons that made landfall, with another one on its way!

Finally, my work continues with the Coordinated Regional Downscaling Experiment (CORDEX), as one of the Co-Chairs of its Science Advisory Team. Our biggest accomplishment since the previous edition of the Cyclone was putting on the Third International Conference on Regional Climate – CORDEX 2016 (<http://www.icrc-cordex2016.org/>). The conference took place in Sweden, on the campus of Stockholm University. The conference was a great success, bringing together over 350 scientists from around the world, with many oral presentations, posters and breakout sessions focussing on specific topics of regional climate, such as distilling climate information from simulation data, understanding and projecting changes in extreme weather and climate events and evaluating the impacts of climate change on vulnerable regions. It was great to be mixing with so many energetic, engaged scientists, and the Swedes were wonderful hosts. Stockholm, by the way, is a beautiful city, situated in the midst of many small lakes and inlets of the sea.

Rachindra Mawalagedara Lecturer



Hello to all cyclone readers! I joined the GE-AT faculty, as a meteorology lecturer, in the Fall of 2016. Let me start by telling you a little bit about myself.

I am from Sri Lanka, a beautiful tropical island in the Indian Ocean. I completed my B.Sc. in Physics from the

University of Peradeniya and moved to Lincoln, Nebraska for my PhD. As you can imagine, transitioning from tropical weather to winter in Nebraska was quite an interesting experience. During my time at University of Nebraska-Lincoln, I focused on regional climate modeling, climate change and climate change impacts.

My work at ISU is fully geared towards teaching and service. During my first semester at ISU, I taught MTEOR 404: Global Change and supervised the Senior Thesis Projects. In the Spring of 2017, in addition to Global Change, I got the chance to teach an introductory class on weather and climate. I really enjoyed teaching these topics because these courses allowed me to draw directly from areas of research that are closest to my heart. Supervising the Senior Thesis Projects has given me the opportunity to get involved in research as part of the teaching process. This course has also allowed me to work closely with the meteorology seniors.

This summer, I got the chance to spend some time at home in Sri Lanka. So far, it has been a gorgeous summer but with quite a few rainy days. After a nice breezy morning, I am writing this to the sounds of monsoon rain falling outside. Throughout the summer, I have been working on redesigning MTEOR 404: Global Change with the help of a grant I got from the ELO. I will be teaching the updated version of the course online in the coming Fall. The course development process had been an interesting one, especially since this is the first time I have had to record lectures. In addition to Global Change, I will be teaching 3 other classes in the coming Fall. I will also be conducting research as a part of the SoTL scholarship I received for the coming academic year.

So far, I have spent a total of 10 months in Ames. Everyone that I met – especially at ISU – has been really friendly and welcoming. Over the past year I have thoroughly enjoyed getting to know everyone better. I am also falling in love with Ames. It is so beautiful and green that it is such a joy to step outside! So here I am, looking forward to another great year at ISU!

Gene Takle Professor



The recent year has provided some high points for students and research in our program.

Students

At the PhD level David Jahn completed his dissertation with a dual degree in Meteorology and Wind Energy

Science, Engineering and Policy. For those not familiar with the WESEP program, it is a new interdisciplinary program launched about 6 years ago with a grant from NSF that enabled us to offer fellowships to outstanding applicants. Most participating faculty and students are from engineering, but David, a member in the inaugural class, was the first meteorologist to complete the WESEP degree program, with a dual degree in meteorology. He was co-advised by Dr. Gallus and me and is now engaged as a postdoctoral researcher with Dr. Gallus. His dissertation focused on improving WRF forecasts for nighttime conditions when abrupt rises in wind speeds at turbine hub height lead to difficult-to-forecast power ramp events in wind farms.

Paul Carlone is an MS student with a BS from Western Illinois and is working on data from our 2012 Crop/Wind-energy EXperiment (CWEX-12) looking at wind farm effects on temperature, winds and fluxes over soybeans. He is the first of our team to look at soybeans. 2012 was a drought year in central Iowa, so he has some extra factors for consideration.

Amanda Black (co-advised by Dr. Chen and me) completed her MS on divergent water vapor transport in connection with cold fronts by comparing those with and without outflow boundaries. She now is now working on her PhD with a focus on regional responses of the diurnal component of divergent water-vapor transport on precipitation.

Kristy Carter received her BS at ISU in 2013 and then went to the University of South Carolina where she received an MS in geography. She returned in Fall 2016 to ISU following in the footsteps

of David Jahn as a Fellow in the WESEP program, also with a dual degree in meteorology. She will be expanding on the WRF modeling work that David launched, with the possibility of model verification using data from our new twin-tall-tower facility. She also has interest in science policy and is the first ISU student to participate in the annual AMS Policy Program in Washington, D.C.

We were again please to have a number of undergraduates working with us during both summer and academic year on projects mostly related to data from our meteorological tower facility.

Dan Rajewski continues on as a postdoctoral research associate, where he is taking an increasingly lead role in the analysis of data from our tower facility. We are now planning major field experiments that will involve intensive measurements in and around a nearby wind farm, with participation of several research collaborators from other universities and institutions. Dan has been lead author on numerous publications and conference reports based on analysis of CWEX data.

Samantha Purdy is our technician now in her fourth year after completing her MS with Dr. Hornbuckle. Her major task for the last three years was to oversee the construction of two 120-m meteorological towers in and near a wind farm about 20 miles NE of the ISU campus (see below). You will find data from the towers on the IEM at <https://mesonet.agron.iastate.edu/projects/iao/>.

Tall towers

I have mentioned that ISU now has a twin-tower research facility in/near an operating utility-scale 200-turbine wind farm about 20 miles from the ISU campus. Each of these towers in 120-m tall (3.6 times the height of the Campanile) with instruments at 5, 10, 20, 40, 80, and 120 m. They are located in agricultural fields away from building, trees and other structures. One is near the middle of the wind farm and the other in NE to the northern-most line of turbines. Students will use the data for class projects and theses. We have research proposed to NSF for a multi-institutional field campaign focused on improving understanding the diurnal meteorology of the atmosphere-earth interface and how wind turbines interact with each other and with agricultural crops. We have new research grants

from the Iowa Energy Center and the National Science Foundation to support research using data from these towers.

I continue to enjoy meeting many of you at AMS or AGU meetings, alumni events and your chance visits to the campus throughout the year. Be sure to stop by and let us know what you have been up to recently. Best wishes for a good 2018.

Outreach

I continue to give ~ 20 talks a year to anyone who will listen on the science and impacts of climate change. I meet a lot of interesting people through these events and have come to appreciate more that a larger fraction of the population is becoming concerned about the impacts of climate change.

Distractions

I have trimmed my stable of little convertibles to four, having sold the 1954 MG TF. I drive the '74 MGB to work when there is no chance of rain. And we have expanded our experimental plantings at the WAZEGONNADOWIDIS farm to include hops, asparagus, garlic, and a few more. See us on facebook https://www.facebook.com/pg/Wazegonnadowidis-Farm-718501688262315/photos/?ref=page_internal.

Xiaoqing Wu Professor



It has been two years since I wrote a paragraph for the Cyclone. I have been enjoying more teaching both undergraduate – and graduate-level courses last two years. It is great to read thanks card and letters from students and their parents. Meeting with students and giving them advices on different things are great as the full professor in meteorology. Last two years, I see two former graduate students, Dr. Liping Deng became the professor in China, and Dr. Jinghua Chen is now an assistant professor in Nanjing University of Informational Science and Technology (NUIST). As an adjunct professor in NUIST, I also help provide advices for a

junior faculty, Dr. Qian Huang. We got a major funding from Chinese NSF last year (\$800K in Chinese dollar). Collaborating with Profs. Yan Yin, Qian Huang, Jinghua Chen, we have, for the first time, used the cloud-resolving model (CRM) over the Tibetan Plateau. Two papers on the cloud systems over the Tibetan Plateau published in the Journal of Climate. Our goal is to systematically simulate the cloud systems over China.

My research continues to cover the cloud-resolving simulations of midlatitude and tropical cloud systems, the parameterization of convective momentum transports, subgrid cloud-radiation and cloud-surface interaction, and the global impact of cloud systems on climate simulations. East Asia Monsoon shows strong impacts on the climate of China in the energy balance and water cycle. Its abnormal fluctuations can affect the behaviors of cloud and precipitation and result in heavy rainstorm or drought in East China. In this study, the summer (June-August, JJA) cloud and precipitation over East China and the Tibetan Plateau (TP) are examined by analyzing the apparent heat source Q1 and moisture sink Q2 computed from the NCEP reanalysis and the satellite observations. The results show that the interannual variation of the vertically integrated [Q1] and [Q2] agrees with that of precipitation over all regions except for the west TP (WTP). [Q1] and [Q2] show similar values over East China, revealing that the heating is mainly due to the condensation process. However, the total [Q1] is significantly greater than [Q2] over WTP, indicating the importance of surface sensible heat flux. Since the main heating source is the sensible heat over WTP, more precipitation will cool the surface and result in an inverse tendency between the heating source and precipitation. High cloud and deep convection show a close relationship with [Q1] and [Q2] over East China and East TP (ETP), while middle cloud and nimbostratus are responsible for the condensation over WTP. [Q1] and [Q2] show a positive correlation with the cloud water path over ETP. Moisture due to the evaporation of anvil clouds detrained from deep convection over ETP can be transported to the downstream and help the development of deep convection in East China.

Thank you for your support!

Gifts to the Meteorology Program at Iowa State from July 1, 2015 to June 30, 2017

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We know that you get many requests from worthy organizations, but we hope that you will consider a gift to the Meteorology Program. The majority of your alumni donations are used to support student activities. Here are some examples:

- Meteorology freshman scholarships
- Travel support to undergraduates attending the national AMS conference
- UCAR Undergraduate Leadership Conference travel costs
- AMS Student Conference sponsorship
- Outstanding Senior Thesis Award
- Cy's Eyes on the Skies
- Travel for seminar speakers

Thank you to all who have donated to the Meteorology Program and your help in allowing us to provide these student opportunities. To make a contribution this year, you can use the form below, sending it to Kristie Franz, 3023 Agronomy Hall, 716 Farm House Lane, Ames, IA 50011-1051 along with a check made out to the ISU Foundation. (Attention: Meteorology Development Fund, Number 1911412). Alternatively, you will likely be called during the year by the general university fund-raising campaign. If you choose to give at that time, you can specify that your gift go to our program (otherwise your donation will go into the University's general fund). Be aware that there are separate funds in the department for geology and meteorology, so you need to indicate your choice by program, not department.

I wish to support programs in Meteorology at ISU.

Enclosed is my gift of:

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IOWA STATE UNIVERSITY

College of Liberal Arts and Sciences

Department of Geological and Atmospheric Sciences
253 Science Hall
2237 Osborn Drive
Ames, Iowa 50011-1027

Student Awards, Scholarships, Internships

- **Anthony Baglione:** ISU Academic Excellence scholarship; Iowa State Out-of-State Student grant; Columbus (OH) Italian Clin Scholarship.
- **Sam Gabrielli:** Part-time meteorologist at AerisWeather, Minneapolis, MN; Meteorology intern at KARE 11 in Minneapolis, MN (summer 2016).
- **Ian Gesell:** Volunteer at NWS office in Valley, Nebraska (summer 2016); Undergraduate research assistant at the National Laboratory for Agriculture and the Environment, Ames, IA.
- **Matt Gunn:** Intern at KCRG in Cedar Rapids, IA (summer 2017).
- **Cassie Happel:** Internship at DTN (formally Schneider Electric) in Minneapolis, MN (summer 2016).
- **Kyle Hugeback:** Intern at KCRG in Cedar Rapids, IA (summer 2017).
- **Garrett Heyd:** Intern at KGAN in Cedar Rapids, IA (summer 2017).
- **Joey Krastel:** Internship at Baltimore County Emergency Management Team, Baltimore, MD.
- **Nick Lesser:** Volunteered at NWS office in Des Moines, IA; Participated in NCAR Undergraduate Leadership Workshop (summer 2016); Internship at DTN (formally Schneider Electric) in Minneapolis, MN (summer 2016).
- **Lindsay Matthews:** Volunteer at NWS office in Quad Cities, IA (summer 2016); Participated in the NCAR Undergraduate Leadership Workshop (summer 2017).
- **Mitchell Morehead:** Undergraduate research assistant at the National Laboratory for Agriculture and the Environment, Ames, IA.
- **Jan Ryherd:** Meteorology intern at KARE 11 in Minneapolis, MN (summer 2016); Meteorology intern at WOI-TV (We are Iowa) in Des Moines, IA (spring 2017); ISU Academic Recognition Award; Ellen M Walvoord Scholarship; Merrill Family Foundation 5M Scholarship; Cessna Scholarship.
- **Zane Satre:** Weather intern at KGAN-TV in Cedar Rapids, IA (summer 2016); Weather intern at WOI-TV (We are Iowa) in Des Moines, IA (spring 2017); Pam Daale Memorial Scholarship (Central Iowa Chapter of National Weather Association); Mary & Orlin Trapp Science Scholarship (Iowa United Methodist Foundation).
- **Jonathan Thielen:** Tim Samaras Memorial Scholarship in Research Meteorology (Central Iowa Chapter of National Weather Association); Dr. Roderick A. Scofield Scholarship in Meteorology (National Weather Association).
- **Kris Tuftedal:** Undergraduate research assistant at the National Laboratory for Agriculture and the Environment, Ames, IA.
- **Caleb Wood:** Internship at Midwestern Regional Climate Center at University of Illinois (Summer 2016).



SENIORS 2016-2017

BACK ROW (left to right): William J. Rickhoff, Theodore Hartman, Henry Gronlund, Brady Newkirk, Tyler Morrison, Eric Manges, Kyle Zenner

MIDDLE ROW (left to right): Garrett Starr, Leyton Briol, Justin Covert, Kristofer Tuftedal, Nickolas Lesser, Mitchell Morehead, Jan Ryherd, Cameron Miller

FRONT ROW (left to right): Antoinette Serrato, Maria Nelson, Cassie Happel, Samuel Gabrielli, Kerry Blodgett