

Cyclone

Best in the nation

Four times the Iowa State student chapter of the American Meteorological Society (AMS) has won “runner-up” Honor Roll status in the national Student Chapter of the Year competition.

Second best wasn’t good enough. So the group decided to do something about it.

“We’ve added an academic chair to our officers and that individual organizes study session helping meteorology students in lower level classes in calculus, physics, and chemistry,” said Justin Gehrts, a senior meteorology major and president of the Iowa State AMS student chapter. “We think this is why we finally won this year.”

The effort paid off as Iowa State has been named the Student Chapter of the Year from the national AMS in 2006-07.

“This is quite an honor,” said William Gallus, professor of geological and atmospheric sciences. “The students have worked very hard the last few years for



Iowa State’s student chapter of the American Meteorological Society has been named the national Student Chapter of the Year. The group’s officers include, from the left, Justin Gehrts, president; Kaj Johnson-O’Mara, academic chair; Liz White, vice president; and Rachel Butterworth, secretary.

this award.”

The student group is very active, both on and off campus.

“We have a large outreach program,” said Liz White, a senior meteorology major and the group’s vice president. “We discuss severe weather safety at the local elementary schools and participate in several science nights in the Ames

area.”

Last year the student group also sponsored a severe weather poster contest from central Iowa school districts. Six different schools participated last year with the winners receiving a weather radio and tickets to the IMAX film “Forces of Nature” at the Science Center of Iowa in Des Moines.

The winners and their posters were also featured on Des Moines television stations WHO and KCCI. Each year a variety of guest speakers are brought to campus to speak to meteorology majors about their chosen profession.

“We bring in speakers that normally aren’t on campus to talk about their jobs to try to interest students in different meteorology professions,” White said.

The student group also coordinates a local weather forecasting contest among its members and participates in a national competition as well. They have organized spring break trips to weather-related locales including the National Hurricane Center in Florida, NASA headquarters in Houston, and the National Severe Storms Lab in Oklahoma.

One of the longest-running projects of the student meteorology chapter is “Cy’s Eyes on the Skies,” a 20-minute information weather show produced, directed, and anchored by students on ISU-TV 18. The show is shown Monday and Wednesday at 6:30 p.m. and gives meteorology majors invaluable practice
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Greetings from the program

Bill Gallus & Carl Jacobson

In the past year, many exciting events have taken place in our department. Probably the one having the biggest impact on us was the hiring of a new surface hydrology professor, Kristie Franz. Kristie comes to us from the University of California - Irvine, where she worked under Soroosh Sorooshian, one of the more famous names in hydrology. Kristie's office is here in Agronomy among the meteorology faculty, and we look forward to collaborations with her. She will be offering several courses that will likely appeal to meteorology students, judging by our history of having several graduates end up with hydrology positions within the National Weather Service. Kristie's position also helps to further the increasing research interaction occurring between the meteorology and geology faculty in our department.

Last March, we held the second annual meteorology program alumni luncheon, which took place at the West Des Moines Marriot hotel during the National Weather Association Severe Storms and Doppler Radar conference. Roughly 50 alumni and current students attended, and we all enjoyed once again the opportunity to see some familiar faces!

We hope you are able to attend next year. The luncheon will take place on Saturday, March 24, at the Rock Bottom Brewery in West Des Moines. The change in venue is due to a change in the location of the NWA conference, which will be held at the nearby West Des Moines Sheraton. The Rock Bottom has great food, and

unlike the past luncheons, attendees can choose from a large number of items on the menu.

The program was also delighted to receive a very generous gift of \$5,000 from Charlie Notis and Harvey Freese during the last year. State funding has been cut several years in a row which makes private support from alumni and friends even more important. Gifts to meteorology provide opportunities for our students and to maintain the excellence of our program. We have used these funds to assist undergraduates in attending the American Meteorological Society annual meetings and NCAR Leadership Workshops, to establish an undergraduate research poster event, to instrument the roof of our building, and to improve our classroom and research computing facilities. By leveraging only a small amount of these funds, the program was successful this year in obtaining over \$21,000 in funding from the LAS Computer Allocation Committee to purchase 13 new PCs for the classroom, upgrade the graphics on 5 more, obtain a new tablet PC for teaching and a printer for student use, and procure Gibson Ridge radar data software for all of our PCs. Thanks to support from our alumni and friends, we can say our student computer laboratory facilities are as good as any in the nation.

Our undergraduate meteorology program remains one of the larger ones in the country with 98 majors at the start of Fall 2006. Our student AMS chapter continues to remain very active. Eight members

Cyclone

William Gallus, Program Director

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attended the AMS annual meeting in Atlanta, GA early in 2006 to present a poster on their activities. For the fourth time in a row, the group was awarded honor roll status. An increasing number of our undergraduates are becoming members and officers in the Central Iowa chapter of the National Weather Association. This NWA chapter was just awarded National Chapter of the Year honors for 2006. The Graduate Meteorology Club, a relatively new organization at ISU, continued to bring in several prominent speakers including Bill Skamarock from the National Center for Atmospheric Research and Dave Schultz from the National Severe Storms Laboratory. Chris Davis, also from NCAR, will be speaking in November. In addition to giving a seminar, the speakers typically meet with the club to discuss career opportunities and to give advice on obtaining employment at their facilities.

Several faculty, students, and alumni were honored with awards in the past year. Cheryl Lemke from The Weather Channel in Atlanta has been awarded the Alumni Award for 2006-07 and will be honored at a ceremony in October. Cheryl spoke to our students about her experiences at The Weather Channel during her visit to Ames. One of our graduate students who completed her PhD work in January, Isidora Jankov, was awarded the ISU Research Excellence Award. An undergraduate student, Lisa Stewart, was selected to attend the UCAR Undergraduate Leadership Conference in Boulder, CO. Among our faculty, Bill Gallus received the AMS Editor's Award for his service as a reviewer for *Weather and Forecasting*. Bill was also chosen to begin serving as the Chief Editor for that journal beginning in 2007. In addition, Bill Gutowski was chosen to serve as an Editor for *Journal of Hydrometeorology* in 2007.

As always, we would like to hear news about you and your family to share in the next *Cyclone*, along with any suggestions or advice that you may have regarding the Atmospheric Sciences program. Please send Professor-in-Charge, Bill Gallus, a message by regular mail or by email (wgallus@iastate.edu). You can track the progress of our program by going to the revised departmental web page (www.ge-at.iastate.edu). If that is not fast enough, or you want more, we can also email the departmental newsletter - just send us your email address. Finally, please drop by and visit us in Agronomy Hall the next time you are on campus.

On behalf of the department, we extend our sincere thanks to those alumni for your generous financial support of the program. Such support helps with the general operation of the program, especially in this time of tight budgets. Although we are happy to note that the last two years offered a break from recent budget cuts, no additional money was provided in either year to restore past cuts, and the upcoming year may once again feature more cuts. The university primarily supplies money to

cover only salaries and staff with a minimal amount for basic services and supplies such as monthly phone charges and photocopying for courses.

The lack of university support means that the meteorology program has several substantial needs. The program has never had money to use to bring in outside seminar speakers; the program would be greatly enriched if we had the means to do this. With roughly 100 undergraduate majors, we have a wealth of exceptional students but no money to use to award them with even a small scholarship to recognize their achievement. In addition, even when funds are available within the university to help teaching programs, departments are often expected to make an in-kind contribution, such as with the annual competition for funding of departmental student computer labs. We have struggled to find the minimum amount needed to allow us to receive funding from the college each of the last few years to supply our students with up-to-date computers. Yet another area in which we could use some help is in basic equipment for the instrumentation and measurements course (for example, temperature sensors, data loggers). Finally, many of you may remember receiving computer assistance from Daryl Herzmann as you performed your senior thesis work. Daryl no longer receives any money directly from the university and must be supported by research grants. For Daryl to remain a useful resource for undergraduates, the program will need to find funding outside of these research grants.

We know that you get many requests from worthy organizations during the course of the year, but we hope that you might consider a gift to the Atmospheric Sciences program to help with the above causes. You can use the form on the back page, sending it directly to Bill Gallus along with a check made out to the ISU Foundation. (Attention: Atmospheric Sciences Development Fund, Number 1911412). Alternately, you probably will be called during the course of 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. As stated above, there are several areas of need. If you would like to specifically direct that your money be used for one purpose, feel free to specify any of the below uses for your donation:

Meteorology undergraduate scholarships
Computing facility and administrator support
Seminar speaker travel funds
Student conference travel fund
UCAR Undergraduate Leadership Conference costs
Outstanding Senior Thesis Award

Thank you for all of your support in the past.

Best in the nation

Continued from page 1

being a television meteorologist.

"This is an incredibly good experience for us," said Kaj Johnson-O'Mara, a senior meteorology major. "We couldn't have this practice otherwise unless we had an internship at a television station."

The students make use of a studio with two professional graphics-rendering computers that allows students to get the hands-on experience they need for their broadcast careers.

Throw in an annual student/faculty dinner and other social events and you have a very active and close-knit student chapter of more than 50 members.

But the addition of the academic component to their goals has made this group unique among AMS student chapters nation wide.

Under Johnson-O'Mara's leadership, review sessions have been established for meteorology students who are having difficulties in courses in mathematics, physics, and chemistry.

"We all know several examples of students who love the science of meteorology but can't complete their degree because of the troubles they have in these classes," Johnson-O'Mara said. "Our goal is to keep students in the program and we think the review sessions have definitely helped in that regard."

The group is always looking for more activities to bring into the fold. One of this year's goals is to offer CPR training to its members. Many of the students are storm chasers and they thought it would be a good idea if they knew CPR.

"The more things we can do to help people who might be injured as a result of a severe storm the better," White said. "We think we need to be responsible citizens." ♦



AMS student chapter produces weather calendar

The student chapter of the American Meteorological Society has developed a weather calendar for 2007.

The fundraiser for the chapter features photos taken by members of the student chapter. The calendar

was also designed by chapter members.

The calendars are \$10 each. Thumbnails of each month's photo as well as an order form are available online at www.meteor.iastate.edu/ams/calendarinfo.php.



14th Annual Iowa State University Atmospheric Science

Undergraduate Research Symposium

3140 Agronomy
Monday 4 December 2006

8:35	Symposium Opening Remarks	1:10	Twentieth Century Trends in Dew-Point Temperature in the US Midwest Jesse H. Wartman Mentors: Daryl Herzmann, Eugene Takle
8:40	Analysis of Alternative Indicators for Forecasting Heavy Snow in Iowa Justin W. Gehrts Mentors: David Flory, Brad Small	1:30	La Niña Effects on Heavy Precipitation Events During Midwest Spring and Summer David E. Kochevar Mentor: Raymond Arritt
9:00	Recent Trends and Variability in Skin Cancer Cases and Their Relation to UV Radiation Levels Adam M. Morse Mentors: Eugene Takle, Ronald Morse	1:50	Thermodynamic and Environmental Parameters Required for Giant Hail: Analysis of the 30 May 1998 Central Iowa Event Evan J. Hutchinson Mentor: Karl Jungbluth
9:20	Diagnosis of the Pacific Decadal Oscillation in Global Climate Models Christopher D. Kuball Mentor: Raymond Arritt	2:10	Correlation Between 500-mb Flow and Tornadoes in Iowa Lisa D. Stewart Mentor: William Gallus
9:40	Coherence of Rainfall Propagation as Simulated by WRF Using Two Different Convective Schemes Andrew J. Anson Mentors: Adam Clark, James Correia	2:30	Modeling Tornado Flow Characteristics Around Structures by Use of FLUENT Karen S. Tarara Mentor: William Gallus
10:00	Break	2:50	Break
10:20	AERMOD Simulation of Maize Pollen Dispersal from 2003 Field Study Phillip J. Butcher Mentor: Raymond Arritt	3:10	Impact of Large, Cold, High Pressure Systems Over the Great Lakes on Accuracy of Iowa Precipitation Forecasts Jillian C. Ihrke Mentor: Karl Jungbluth
10:40	2-D Simulation of Breaking Gravity Waves Ian M. Lazaretti Mentors: William Gutowski, Joseph Prusa	3:30	Analysis of Methods for Substitution of Upper Air Data in the Application of Gaussian Dispersion Models Angela M. Mowrer Mentors: Brad Ashton, Matthew Johnson, Lori Hanson
11:00	Correlation Between Storm Prediction Center Watch Verification and 700 and 850 hPa Cap Strength Elizabeth D. White Mentors: Jeremy Grams	3:50	Diagnosis of Severe Storm Reports in Comparison to Upper-Level Linear Jet Streak Quadrants Kaj J. Johnson-O'Mara Mentors: William Gallus, Adam Clark
11:20	Effects of Nighttime Temperatures on Iowa Corn Yields Steven P. Bruening Mentor: S. Elwynn Taylor	4:10	Comparison of Radiosonde and Profiler Data with ACARS Data for Describing the Great Plains Low-Level Jet Ross W. Bradshaw Mentor: Daryl Herzmann
11:40	A Comparison of Mid-Level Frontogenesis to Radar-Indicated Heavy-Snowbands Christopher D. Karstens Mentor: William Gallus	4:30	Symposium Closing Remarks
12:00	Lunch Break		

All presentations are open to the general public. Faculty, staff, and students are encouraged to attend. Parents, families, and friends of presenters are especially welcome.



Bill Gallus can add art adviser to his resume after working with new exhibition on campus.

Art obsession

When he was first approached about a new art exhibit in Iowa State's Brunnier Museum that would spotlight the weather, William Gallus thought the artists would choose dramatic scenes of tornados, snowstorms, or lightning strikes.

"The majority of the artwork in the exhibit is much more subtle. I was surprised that so many works had peaceful cloud scenes," says Gallus, professor of geological and atmospheric sciences.

"I don't think the works are what a meteorologist would think of painting when asked to depict weather."

Instead of hailstorms tearing through the sky or tornados bearing down on an unsuspecting farm, the artwork in "OBSESSED: Images of Weather" are much more calm and sedate.

"This approach forced me to look hard at the paintings," Gallus said. "The basic thing is that weather can

take place even with small batches of clouds."

"OBSESSED" has been on display in the Brunnier Art Museum in the Scheman Building on campus since the beginning of the fall semester. The exhibition features the works of five regional artists whose art repeatedly explores sky.

The artists were partnered with Iowa State atmospheric scientists, exchanging concepts, imagery, and philosophies.

For the past two years, Gallus has been attending meetings and providing technical assistance to the artists. At an initial meeting he was joined by other atmospheric science faculty members, Iowa Department of Transportation officials, area farmers, and many of the artists.

"We shared thoughts, talking about how weather has affected our lives," he said.

At later meetings, it was just Gallus who represented the scientific side of the discussion. Eventually he

wrote statements about the works as they were brought into the Brunnier.

And although he was the scientific "adviser" on the project, Gallus had little contact with the artists after that first meeting. That first meeting must have been productive. Gallus says the paintings in "OBSESSED" are very realistic.

"The detail and colors on the works were so perfect it's almost like looking a photograph," he said. "I didn't find any major flaws in the way the artists depicted the atmosphere."

One painting in particular drew his attention at the exhibition opening last September. The work reminded Gallus of the Colorado Rockies.

"There were several I really liked, but one in particular had fairly black-looking clouds just coming over the nearby hill," he said, "and if you've ever been in Colorado hiking, you'll recall the rush of fear and the urgency of needing to get down out of the mountains when you see that."

Faculty News

Mike Chen

Diagnostic analysis in the lab and numerical simulation with high-performance computers may not always be sufficient for us to fully understand the mechanisms creating important meteorological phenomena. Sometimes, special field experiments are needed to enhance our understanding of these mechanisms. A major field experiment was conducted by Asian countries to explore the role of the land-atmosphere interaction in the water cycle of the Asian monsoon during the past decade (1996-2005) under the GEWEX (Global Energy and Water Cycle Experiment) Programme. This experiment is named as the GEWEX Asian Monsoon Experiment (GAME). I have been serving on the International Science Panel of GAME since 1996. This experiment was finished in 2005. Because of its unprecedented success, the Japan and Asian meteorological community immediately developed a follow-up experiment to explore the land-sea-atmosphere interaction for the Asian monsoon. This new experiment is named as the Monsoon Asian hydro-atmospheric Science Research Initiative (MAHASRI) and covers four regions: North Asia, East Asia, Tibet/Himalaya, and the tropics. Being involved with the development of the MAHSRI science plan, I was again invited to serve the International Science Committee of MAHASRI. Because of this reason, I have been developing an East-Asian Monsoon Experiment (EAMEX) with colleagues from Taiwan and Asian meteorologists to cover the East-Asian component of MAHASRI. Recently, representatives from ten Asian countries held a two-day (September 29-30, 2006) workshop in Taiwan and discussed the science plan of EAMEX. Hopefully, this science plan and a companion implementation plan will be hammered out by the end of 2006. My next major task is to gain the funding approval for EAMEX. The planning and execution of a major field experiment involves not only the development of new science, but also some administrative management. To a scientist, his/her dream is to discover/create new science. However, the management of an experiment forms a new dimension of my scientific endeavor. I hope that the EAMEX will get



off the ground next year.

As usual, the large-scale dynamics lab still has Judy Huang, Simon Wang, Paul Tsay, Mark Loeffelbein, and Jim Peterson (who is a free-lance member of this lab). Adam Clark finished his MS degree and joined Dr. Bill Gallus' group, but is still a resident Ph.D. student in our lab. Although I still teach some dynamics courses for both undergraduates and graduates, the development of EAMEX occupies a large chunk of my time and effort. If the requested funding of this experiment is approved, I may have to devote more research effort to accomplish this task in the next several years. I hope that I have good news to write about in the next Cyclone report.

Dave Flory

For this year's *Cyclone* statement I would like to focus on upgrades to the meteorology classroom geared towards improving the classroom experience for the students. While my fall and spring are replete with teaching responsibilities and service to the department, a second consecutive pathetic chase season resulted in plenty of opportunity to focus on improving my position as lecturer.



A successful request for extra funding available from Liberal Arts and Sciences Computer Advisory Committee allowed the department to make several purchases toward improving teaching and the classroom experience for students. New Dell desktops with flat panel monitors were purchased to replace aging machines and bulky CRT monitors. This resulted in a much cleaner look to the classroom and more student workspace for lab work. Many of you will also be happy to hear that each of the machines now dual boot to either a Linux or Windows operating environment. The extra computing funds also allowed the purchase of Gibson Ridge Level II Analyst Edition (aka, GR Level II AE) radar viewing software licenses for each of the machines. GR Level II AE is an advanced Nexrad Level II analysis application. It features a high quality volumetric display and several high-resolution reflectivity derived graphical products in addition to the standard Level II data products (taken from www.grlevelx.com). Use of the 3-D analysis tools

available through this software will give students a much better understanding of storm structure and its evolution. A word of caution for those of you who love meteorology and meteorological data: once you see GR Level II AE, you will definitely want it! It is that good.

Other products newly available on the meteorology machines are WES and BUFKIT. WES (Weather Event Simulator) is an AWIPS training package that allows users to run case-studies in an environment nearly identical to that used at National Weather Service offices, while BUFKIT offers a whole new realm when it comes to viewing model data. Both software packages provide students with exposure to software frequently used in the forecasting community making them more attractive to perspective employers.

Also purchased with the LASCAC money was a Tablet PC. In my mind, the Tablet PC is the next great revolution in teaching meteorology. The Tablet PC allows real-time annotation on just about anything you can view on a PC. This allows the instructor to perform such activities as skew-t, contouring, and frontal analysis on near real-time weather data. These annotations can also be saved to file and posted on the class webpage for student review. Students are frequently asked to come to the tablet to provide their own subjective analysis increasing student accountability in their education and frequently illustrating exactly how 'subjective' subjective analysis can be. Currently, the tablet has caught on more with students than other faculty. I remain confident that as the tablet's potential manifests itself and existing kinks are worked out of the system, it will see ever increasing use in the classroom as faculty and students discover new and innovative ways to incorporate it into the curriculum.

Outside of my duties as lecturer, I continue to do research with Drs. Arritt, Gutowski, and Takle on NARCCAP (North American Regional Climate Change Assessment Program). I was also recently nominated and elected vice president of the Central Iowa Chapter of the National Weather Association. My goals for the association include increasing media and student involvement, in addition to thoroughly exploring the possibility of making the chapter a joint NWA/AMS chapter.

On a more humorous note, several past and current students have recently given me the nickname of 'Mr. Cap'. It seems that a large majority of the times I went chasing this year resulted in significantly capped conditions and, typically, cloud-free, crystal clear skies. Toward the end of the season it even seemed that days I was merely *thinking* of going chasing ended up being capped. It has gotten to the point that a former student jokingly, I hope, contacts me before potential severe days to see if I am even thinking about going out to get an

idea of the possible cap strength for the day. The way it is currently going, it might end up pushing me back to chasing exclusively from my Linux boxen. I guess it will give me more time to improve and polish my teaching methods and continue the search for new and innovative teaching techniques following in the footsteps of a number of outstanding instructors who have come before me in this department.

Kristie Franz

Hello. I would like to introduce myself to all the past and present associates of the meteorology program. I am a new assistant professor in the Geology and Atmospheric Sciences Department specializing in surface water hydrology. I completed my doctorate at the University of



California-Irvine this past summer and soon after packed up and headed east to Ames. It was an interesting trip through the country's famous deserts, mountains and heartland. If I ever get the fortune to meet you, I will share my story about getting stuck in Las Vegas for four days in mid-July! It was not as fun as it sounds – trust me. Thus far I have found Ames, ISU, and the department very welcoming.

I have a relatively diverse background, which is appropriate given the diversity of the department I have joined. I have a BS in geology, an MS in hydrology, and a PhD in civil engineering. Much of my research relates directly to the National Weather Service (NWS) hydrologic services and I have worked closely with this agency in the past. I conducted a series of projects that focused on incorporating ensemble prediction verification statistics into the NWS operational streamflow forecasting system. Based on these studies, prototype verification software was developed and is scheduled to be released to all NWS River Forecast Centers by the end of this year. Forecast verification is as important in hydrology as it is in meteorology. Until the current forecast systems are well understood, it is difficult to focus efforts for improvement.

My dissertation research was an investigation into the potential to improve operational streamflow forecasting through the use of newer, more advanced, snowmelt models. Snow is a major component of streamflow in the springtime. Estimating the timing and amount of snow melt is important for predicting floods and water supplies throughout the country. While researchers continue to develop more complex hydrologic models, the models

applied for predicting streamflow have changed very little over the years. However, replacing the old models with newer models is not a straightforward task and my study highlights several challenges that the hydrologic forecasting community faces. One of these challenges is overcoming the limitations of uncertain model input data, such as precipitation.

It is advantageous that I am now in an atmospheric sciences department, as the majority of hydrologic model inputs come from weather observations and predictions. The strong interest in interdisciplinary work here at ISU is encouraging. I look forward to working with the weather and climate experts in this department to continue to address the issues at the interface of meteorology and hydrology. I am particularly interested in how hydrologists can take advantage of climate and weather forecasts.

My future research plans include the continued investigation of snow models, evaluating the application of satellite products in hydrology, and testing data assimilation methods and newer data sources for operational forecast models.

William A. Gallus, Jr.

Greetings from Ames! Since the last edition of the *Cyclone* a year ago, several events stand out as particularly memorable for me. First, I was interviewed extensively for a History Channel documentary on what it would be like if a tornado hit downtown Chicago. This media crew came to ISU like so many others so that they could film the tornado simulator over in Howe Hall. That simulator remains a collaborative effort between Drs. Partha Sarkar and Fred Haan in Aerospace Engineering and myself. For a change, the documentary which aired during the summer actually used a large amount of the interviews that were done with me. Second, I enjoyed collaborating with Tim Samaras, a famous tornado chasing engineer from Denver, on another project related to the simulator. Using some of the money we received from federal funding, we selected a crew of four newly graduated seniors and two current graduate students to travel with Tim to deploy his unique ground-based instrument probes to try to get near-ground measurements of tornado winds. This project elicited a lot of media attention, but unfortunately Mother Nature did not cooperate, leaving the country with probably fewer May and June tornadoes than at any time in history. The students who endured nearly 15,000 miles of driving still felt the experience was well worth it. We all hope to try again next spring.



Another memorable experience for me over the past year was assisting the artists at Brunnier Art Museum here in Ames as they prepared for an exhibit titled "Obsessed: Images of Weather." As the opening date approached on August 21, I met with the curator for many hours, and had the privilege of viewing each painting and discussing what of meteorological interest could be found in each of the over 20 works. For me, this was a great teaching opportunity. The artwork is amazing and the entire exhibit well-done, and I'd encourage you if you get a chance to stop by before it closes on March 18.

Probably the most memorable event for me, though, was not directly related to my job as a professor. Instead, it was the tornado which threatened the ISU-Colorado football game here in Ames last November 12. I have been a tornado chaser for nearly 20 years, and had had a disappointing season in 2005 since severe weather avoided Iowa in the spring and summer. As you may recall from the last *Cyclone*, a weak tornado hit the ISU campus in September, downing most of the trees in the courtyard of the Agronomy building. As if that was not enough, on November 12, a series of strong tornadoes rolled across central Iowa in the late afternoon. One of these tornadoes passed only 1 mile from my home, and I was able to film the entire thing from initial touchdown in west Ames to the dissipation of what became a very large tornado near Gilbert just north of Ames. Ironically, after 20 years of chasing, my first experience of being close enough to hear a tornado's roar ended up happening in my front yard! I was able to assist two of the National Weather Service personnel the following day in a damage survey of the deadly Stratford tornado which caused some F3 damage.

Apart from these more memorable events, the past year was one in which I was promoted to full professor, and was able to continue the teaching and research I enjoy. I taught the advanced synoptic and mesoscale forecasting courses, 411 and 417, a mesoscale dynamics course, 407/507, and administered the internship credit course, 321. For the fourth year in a row, I was invited to serve on the National Science Foundation Graduate Fellowship review panel for the geosciences. These fellowships are considered by many to be the most prestigious offered in our field, and it is a thrill to be able to view the applications. Those in charge of this program remind us that in these applications we are seeing the Nobel Prize winners and college presidents of the future.

My main area of research this past year has continued to be the use of high resolution numerical models to try to improve warm-season rainfall prediction. I received a new NSF grant to use the WRF model at near-cloud resolving grid spacings to explore how the microphysical schemes influence the evolution of convective systems in the model. I also am part of a team that received a large NSF grant to expand earlier work that created a virtual

tornadic thunderstorm educational activity. With the new funding, we will develop a virtual volcano activity. As I alluded to earlier, I continue to collaborate with the aerospace engineers on the tornado simulator. Finally, I was awarded funding from NASA to explore the impact convective systems have on supplying water vapor to the lower stratosphere. These four projects support four graduate students, so I look forward to a busy and exciting year ahead.

Bill Gutowski

This past year has brought some interesting new opportunities for national service as part of my work. First, last fall, I was invited to be a member of a committee convened by the National Academy of Science to review and report on what is known about the effects of looming climate change on the nation's transportation system, with recommendations for the future. As you may know, the National Academy of Science was founded during the Civil War to provide expert scientific advice to the federal government. The specific committee I joined includes managers of transportation systems, engineering consultants, and, of course, climate scientists. It has been very interesting to work with professionals who deal with day-to-day problems like how to get people and goods efficiently and safely from points A,B,C, and D to points D,C,B, and A – and then back again. I've learned more about routing trains across the US than I ever imagined!

I have also become a member of two committees under the US Climate Change Science Program (CCSP). The CCSP started in 2002 as cabinet-level organization in the federal government to improve the government wide management of climate science and climate-related technology development. Because the CCSP resides in the Executive Branch, when I am doing committee work, I am a temporary (but not paid) government employee with the President technically my boss! The committees I've joined are charged with reviewing current state-of-the-science in simulating climate and evaluating weather and climate extremes and how they may be changing.

Some of my international work has continued, working with colleagues at UNESCO's International Centre for Theoretical Physics (ICTP). ICTP's mission is to foster science in developing countries. As part of this mission, I went to Ghana in January 2006 for the *First ICTP West African Workshop on Regional Climate and Impacts*. About 40 scientists attended from several West African countries. We had a great exchange of ideas, which



continued later in the year at another ICTP workshop I helped deliver. Before going into that, I should also note an excursion we made to Lake Volta, where Ghana runs a major hydroelectric station. Ghana has had dry years recently, and Lake Volta's drop in water levels is threatening Ghana's ability to generate electricity – a very clear example of how climate variability can impact a country's economy.

Later, in June, I helped run a workshop on climate modeling at ICTP itself, in Trieste, Italy. This workshop brought together over 150 scientists from all over the world. Many were training to learn to do climate simulations themselves, and we all learned much from each other about climate change and impacts of climate change on agriculture and water resources.

In addition, Iowa State faculty Gene Takle, Ray Arritt, and I put on a couple of small workshops within the larger meeting that focused on educating scientists and comparisons of regional climate simulations at locales around the world. The first topic aimed at using the internet to link students at multiple institutions in joint classes. Participating students gain international perspectives on climate change and its impacts while also developing into members of a global community of climate researchers. I am already testing some of this in a course that has been offered simultaneously at the University of Cape Town, South Africa, and Iowa State: Meteorology 452x/552x – Physics of Climate (www.meteor.iastate.edu/classes/mt452x/).

The second special meeting at the ICTP workshop focused on a program operating under the Global Energy and Water Experiment (GEWEX) called "transferability." Our transferability program asks a basic question, "How portable are our climate models?" Can they simulate different regions and climates of the earth equally well? This is a program that needs scientists from around the world to offer their local expertise; ICTP is an ideal forum for discussing it and making further research plans.

Also in the area of education, I was part of a small workshop in February 2006 at Carleton College (Northfield, MN) that focused on educating undergraduates to become graduate students and eventually the next generation of researchers in the geosciences. A great education specialist, Prof. Cathy Manduca, led the workshop, and it was an honor to be part of it.

Our future ISU faculty member, Kristie Franz, was also at the workshop, although at the time, we did not know she would be joining us. Iowa State hired Kristie after a search process that I helped lead. We are happy to note that our department has sufficient stature that we had over 60 applicants for the position, nearly all of them quality scientists. Working through 60-plus applications was substantial work, but ultimately well worth it.

Other exciting research activity continues to develop. With DOE support, my postdoc Babatunde Abiodun (from Nigeria), my colleague Joe Prusa, and I have been developing a new atmospheric circulation code that we have coupled to part of the NCAR climate model. The interesting feature about the code is that its grid can stretch to give higher resolution in targeted regions, potentially even doing this while a simulation progresses. Results so far have been promising, and we hope the code can eventually become an alternative atmospheric-dynamics code in the NCAR model. We have also discussed with ICTP the potential for this code to become part of their next-generation model, too.

Also this year, a new research program, the North American Regional Climate Change Assessment Program (NARCCAP) started. NARCCAP involves several institutions in the US, Canada, and the UK, including Iowa State. Its goal is to produce scenarios of future climate change for the US with probabilities attached to the changes, so that others can make credible assessments of potential impacts of climate change in such areas as agriculture, water resources, transportation, human health, and natural ecosystems. The work also involves collaborating statisticians and information-technology specialists, because of the large volumes of data we need to save and make easily available to other researchers. We are part of a great team of scientists, headed by Linda Mearns at NCAR.

There never seems to be enough funding to do all this work, but somehow we manage to get by. These are very interesting times to be involved in atmospheric science!

Carl Jacobson

This was a particularly busy year on the administrative front between the external review, faculty search in surface hydrology, three promotion/tenure cases, and hosting by the geology program of the 66th Annual Tri-State Geological Field Conference, not to mention all the normal chair activities. As a consequence, I do not have as much to report in terms of teaching and research as I would like. Most disappointing is that I was not able to get in my usual length of field work. Traditionally, I've spent a month every year during winter break working in southern California/southwestern Arizona. For about the past five years, I've been accompanied in this venture by Jane Dawson (Jane is a Senior Lecturer in geology, but many of you know her as an adviser to meteorology undergraduates). Last year we were able to get out for just a week, and since the time was so short



we flew rather than drove. For those of you familiar with southern California, we spent the entire time in the Sierra Pelona, located about 40 minutes north of Los Angeles. You pass immediately south of it when driving from Los Angeles to Palmdale.

Probably my most memorable experience from last year was attending the Backbone of the Americas Meeting in Mendoza, Argentina sponsored by the Geological Society of America and Geological Society of Argentina. This is a spectacular place for any geologist to visit, but was particularly relevant for my interests. As many of you may know, the Andes are an actively forming mountain range related to the subduction of part of the Pacific plate (strictly speaking, the Nazca plate) eastward beneath South America. It turns out that the Andes at the latitude of Mendoza are a bit anomalous compared to most mountain belts, but show some distinct similarities to the Rocky Mountains and other ranges of western North America which formed between about 80 and 40 million years ago. The meeting provided the opportunity for geologists working in each area to get together and compare notes. The meeting itself was six days. I also participated in a post-meeting field trip involving a transect across the entire width of the Andes. It started in Mendoza and ended up along the Pacific coast at Viña del Mar, Chile. Both the geology and scenery are just incredible.

For the first time in several years I have taken on a new graduate student – Jon Reis, who just received his BS from our department. Jon will likely be working on the structure of the northern Dome Rock Mountains near Quartzsite, AZ. Hopefully, he, Jane, and I will be able to get out there for the full duration of the upcoming winter semester break.

Gene Takle

I hope you have had a stimulating and productive year. The past year has brought some interesting wrinkles to my contribution to the meteorology program. I have continued my research programs in regional climate modeling and shelterbelt modeling and participation in activities of the AMS and UCAR, along with teaching the Global Change course and overseeing the senior thesis program.

We had a terrific crop of senior theses in Fall 2005 that again raised the bar on both research quality and professionalism. With very extensive help from secretary Darlene Pruisman, we assembled the theses in a spiral bound proceedings, which has brought very



favorable comments from our faculty colleagues at other universities. Contact Darlene (Darlene@iastate.edu) for a copy. Early signs from Fall 2006 indicate that the bar may go even higher.

In January I assumed the position as Interim Director of the University Honors Program (a 1/3 time position). Honors is spearheading an effort promoted by President Geoffroy to enhance the research experiences for undergraduates (sound familiar?!). We are using the 13-year experience of the annual Atmospheric Science Undergraduate Research Symposium as a model and will have an all university Undergraduate Research Symposium on April 11, 2007. We also are considering establishing an *ISU Journal of Undergraduate Research*.

I have had opportunity for some interesting research activities this year. As part of the international Global Energy and Water Experiment (GEWEX) I have had opportunity to travel to Vienna, Melbourne, and (October 2006) to Rome. Work on this project, in collaboration with Drs. Gutowski and Arritt, involves evaluating regional climate simulation performance by several models on several continents. Also as a part of the regional modeling program, I participated (again with Drs. Gutowski and Arritt) in a two-week workshop on regional climate modeling for scientists from developing countries in Trieste Italy last May-June. Time after the workshop allowed for travel to Florence (Italy's finest art and architecture) and Padua (to see Galileo's university and the first medical autopsy lecture hall).

Our previous work with agricultural shelterbelts got unexpected recognition in the form of a request from the Food and Agriculture Organization of the UN to participate in their August 2006 *Workshop on Coastal Protection in the Aftermath of the Indian Ocean Tsunami: What Role for Forests and Trees?* in Khao Lak, Thailand. With help from Drs. Chen and Wu, I wrote a paper on "The role of coastal forests and trees for protecting against wind and salt spray" and participated in a week of discussions on how trees and shelterbelts could be used to suppress coastal damage from tsunamis and tropical cyclones. The area of Thailand where we held the workshop (near Phuket) experienced some of the worst damage and loss of life from the tsunami in December 2004. Within a couple of miles of the resort where we stayed, over 8,000 people were killed or remain unaccounted for due to the wall of water over eight meters high that unexpectedly hit this flat coastal area (www.asiantsunamivideos.com). The conference concluded that there is no plausible natural or manmade structure that can protect against such a hazard. For lower magnitude and more frequent tsunamis and tropical cyclones, however, carefully designed shelterbelts can offer effective protection, as was experienced in India where several coastal villages were spared because of their protective coastal mangrove forests.

12 *Cyclone*

Hopefully the coming year will treat you well, both personally and professionally. I look forward to hearing about your career paths since leaving ISU. Send me a note at gstakle@iastate.edu.

Xiaoqing Wu

My research group continues to work on the modeling and understanding of cloud and climate systems using the ISU cloud-resolving model (CRM) and general circulation model (GCM) in the past year. At the end of Spring 2006, I was promoted to the rank of



associate professor with tenure, which is the recognition of my performance in teaching, research, and service.

For the first time, year-long CRM simulations of cloud systems over the central US are successfully completed on our Linux Cluster computer and evaluated against observations. This provides a potentially important approach to produce **long-term global** cloud and radiative properties, especially over climatically sensitive regions by combining the CRM with the mesoscale model reanalysis [such as the National Oceanic and Atmospheric Administration (NOAA) rapid update cycle (RUC) analyses], satellite radiation, and surface heat flux measurements.

We also successfully implemented the modified convection parameterization scheme with new closure, trigger and convective momentum transport in the ISU version of NCAR Community Climate System Model (CCSM). Climate mean (e.g., global precipitation distribution) and climate variability (e.g., MJO and ENSO) are considerably improved in the uncoupled and coupled ISU CCSM simulations. Our improved convection scheme is one of few candidates for the next generation of NCAR CCSM. I am also in contact with IBM software engineers to run the ISU coupled CCSM on ISU Blue Gene computer which is ranked 73rd fast in the world. This will provide us great computer power to improve the coupled GCM for the modeling of global climate and interpreting of climate change.

During the summer, I spent three weeks in Beijing. As an overseas member of the Climate Model Development Project in the Institute of Atmospheric Physics (IAP), Chinese Academy of Sciences, I collaborated with Chinese scientists to implement the improved physics package into IAP's climate model. This will test the performance of the scheme under different dynamical framework. With the high-speed internet, working over the office in Beijing is like in the ISU office, the world becomes small.

Broadcasting the weather

Cheryl Lemke seen by millions on The Weather Channel.

The self-described “shyest kid in class” now is seen on television by millions.

“When I was in school I always thought I would be working in a National Weather Service office or doing research somewhere,” Cheryl Lemke says. “Either one would have been fulfilling to me.”

But as Lemke was nearing graduation from Iowa State with a degree in meteorology, she started to hear a rumor about the National Weather Service.

“They were undergoing cutbacks back then,” she remembers, “and jobs were hard to come by.

“I thought to myself ‘I had better rethink this. Maybe broadcasting meteorology would be right for me.’”

The rest as they say is history.

As an Iowa State senior, Lemke worked as an intern at both WOI-TV and WHO-TV, gaining valuable experience as a broadcast meteorologist. She also took several broadcasting courses to learn more about her proposed profession.

But when it came time to get a job after graduation – now that was a different story.

“I sent out a lot of resumes and while I got a lot of positive feedback, I kept getting turned down because I didn’t have any prior experience,” she said.

Lemke gave herself six months after she graduated from Iowa State to find herself a job as a broadcast meteorologist. If after six months she wasn’t successful in her job search, Lemke told herself she



would go back to school and get a master’s degree.

Days went day. Then weeks.

Followed by months with no luck yet in landing a job.

“Then close to my self-imposed deadline I got a job at WTHI-TV, the CBS affiliate in Terre Haute,” she said.

There she worked for almost three years, working her way up from the noon weather anchor up to the daily evening meteorologist.

Soon she caught the attention of a relatively new venture called The Weather Channel, a cable network that reported the weather, 24-7. In 1986 she joined the network and has worked there ever since.

While at the network, she has served as the co-host of the early morning program, “First Outlook.”

She holds both the American Meteorological Society’s Seal of Approval and the National Weather Association’s Seal of Approval for her on-air skills.

This past fall, Iowa State’s

Department of Geological and Atmospheric Sciences’ Outstanding Meteorology Alumni Award also honored Lemke.

Although Lemke has had opportunities to move on to large market newscasts, she has stayed on at The Weather Channel.

“It’s a weathercasters dream,” she says. “I work with 100 people with degrees in meteorology with the best high tech equipment.

“I’m still enjoying my job after all these years.” ♦



Major wager *Michael Falk wins Jeopardy's Tournament of Champions.*

After winning \$59,403 on Jeopardy! in April, Milwaukee researcher Michael Falk (Meteorology 2001, MS 2004) says he barely snuck into the show's recent Tournament of Champions.

But when you're good, you're good. No matter where you fall in the pecking order.

Last spring, Falk wowed trivia buffs everywhere when he was the only contestant to recognize a quote from "The Divine Comedy" in Final Jeopardy!, winning the Tournament of Champions and a \$300,000-plus game show fortune.

"I made good grades [in middle school]," says Falk, a lifelong game show devotee who became serious about Jeopardy! as a teen. "I thought I knew a lot...actually, I thought I knew everything there was to know in the universe."

Apparently, he says, he didn't. His bid to qualify for the show's teen tournament in 1993 failed.

But a passion for trivia followed Falk to Iowa State. A meteorology student and singer, Falk fell in love with ISU's Quiz Bowl, a Jeopardy!-

like trivia organization that competed in tournaments across the country.

The ability to seek out facts and commit them to memory, he says, became an important part of his success in Quiz Bowl. He soaked up knowledge during his college days and has remained a huge Jeopardy! fan ever since. And last year he realized he still had the bug: This time, Falk tried out for Jeopardy! and passed with flying colors.

Falk admits the old adage is true about the game show being easier to play at home than in person.

"I found out in March 2005 that I was going to get the chance to try out for the show. I taped in March 2006, so I had a year to prepare. I spent a year watching every game at home with my clicky pen [a substitute for ringing in on the show], trying to get the hang of it."

"Getting the hang of it," Falk says, includes remembering to phrase each response in the form of a question and knowing how to ring in correctly.

But coming up with the correct response is still the foundation of the show, and Falk says he owes some of his success to ISU. Physics 221 and

Political Science 251 came in handy, he says. So did reading the *New York Times*, making flash cards, studying geography, and reading, reading, reading.

There are also a lot of things you just know, he says. Falk's fellow ISU alum, George Washington Carver, was the subject of one of his correct responses in the Tournament of Champions.

"My ISU alum friends were very proud of that," he said. "I couldn't get that one wrong."

Falk says his big win on Jeopardy! has been great, but he wouldn't say it's changed his life. He and his wife will buy a house, and Falk says it will be nice to never have to worry about mortgage payments. But he says he'll keep riding his bike to work at the University of Wisconsin-Milwaukee. He'll keep spending time at his church and listening to music and surfing the web. And he'll keep soaking up knowledge, because it isn't just about winning a game show.

"To me, learning is interesting," he says.

About the Writer | Kate Bruns is the associate editor of *VISIONS* magazine.

Meteorology Alumni Luncheon

Saturday, March 24, 2007

Rock Bottom Brewery

4508 University Avenue

West Des Moines, IA

Note: Rock Bottom Brewery is a short walk from the site of the NWA Conference, which will be held at the West Des Moines Sheraton (1800 50th Street)

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I wish to support programs in Atmospheric Sciences at ISU. Enclosed is my gift of:

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_____ Atmospheric Sciences Development Fund (1911412)

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Dr. Bill Gallus
Dept. of Geological & Atmospheric Sciences
3010 Agronomy Hall
Iowa State University
Ames, IA 50011-1010

Don't forget to send us news about yourself and your family for next year's Cyclone. Please send to the above address or email us at wgallus@iastate.edu.

Cyclone

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