A WINTER FOR TORNADOES?

By Kevin Forney '12

With what has been a very mild winter in the Northeast (and in fact for most of the United States) the question arises: what keeps young aspiring meteorologists excited? The answer: strong tornadoes early in the year.

To say that this winter has been a disappointment for snow lovers is an understatement. February of 2012 is now the warmest February on record in Ithaca (by a mere fraction of a degree, but still it is the warmest....). In March, warmth was again a theme as Ithaca noted a string of 7 consecutive 70+ degree days. Is this climate change?

Perhaps a sign, but not beyond a doubt. Is it weird? Definitely. Large amounts of snow just never happened; no East Coast Winter Storms to marvel at (sorry, Jase), no magnificent blizzards, and not even a decent season for lake effect.

Thus, it was to tornadoes and severe weather that one had to turn their eyes. While early tornado seasons aren't uncommon, this year has so far proven to be particularly eventful. On February 28th, a system across the Great Plains brought the first tornadoes in Nebraska during the month of February since at least the 1950's. Then 3 days later, conditions were prime for the sparking of a quite severe outbreak.
stretching from the Gulf Coast up to the Ohio River Valley. This outbreak was devastating in its swath as there were over 100 tornado reports, and over a dozen fatalities as a direct result of tornadic activity. The real standout incident would have to be the EF4 tornado in southern Indiana that tore along a 49 mile long path. Hail reports for this outbreak were also quite impressive with many locations reporting hail of at least 3” in diameter and even one report from Worthville, Kentucky of hail a whopping 4.25” in diameter.

So while the reports were not in our area, Cornell meteorologists never give up on trying to become part of the experience. Our lovely 1101 computer lab was definitely “weather central” for a good deal of the late morning and early afternoon. Radar imagery was pumped through the touch-screens and multiple computers were designated for looking at the latest warnings and major threats. To round it all off, one of the Windows capable machines in the back was devoted to local media coverage of nasty areas. Over the course of time I was present I saw pieces of coverage from Chattanooga, TN to Atlanta, GA to Louisville, KY. Now as anyone who has seen severe weather coverage knows these aren't the highest quality in terms of meteorological fact, which was typified by the Tennessee coverage focused on the insight of Sheriff 'Ronnie'. However, Cornell weather geeks to the rescue with all the data we could possibly want.

This was but one 'fun' day for us in terms of just following severe threats across the nation. While we always hope that warnings are heeded and injuries don't occur, we know they do which does subtract from the fun, but inside all of us 'meteos' beats a monster just hoping for that destructive beast of a storm. So far, this season hasn't disappointed, and we shall see if such fortune continues. All in all, 2012 may just be Cornell meteorology's “Year of the Tornado”.

Ithacation Editor: Molly Smith
Interview: Keith Eggleston
Research Support Specialist at the Northeast Regional Climate Center

Interview by Molly Smith ’14

How did you become interested in meteorology in the first place?

I first became interested in meteorology taking Earth Science in high school. I was particularly fascinated by weather maps.

Where did you go to college?

Cornell Class of ’82!

How did you come to work for the NRCC?

I was in the right place at the right time. I worked for the Atmospheric Sciences Unit as a work-study student during my sophomore through senior years at Cornell. Coincident with my graduation, Cornell received the first grant to start up the Northeast Regional Climate Program. They were looking to hire someone and, through my work-study position, I had acquired the experience and skills they were looking for. It didn't hurt that my Cornell adviser was the director of the Center at the time.

What exactly do you do for the NRCC?

The job has evolved quite a bit over time. Currently, I do a lot of computer programming; especially designing and implementing interfaces to our climate database for a variety of users, such as, the NWS and USDA. I have also done a lot of work lately on linking agricultural pest models to our climate data. I'm constantly involved in trying to expand and improve the quality of the climate data.
What’s the worst weather you’ve ever been stuck in?

Having lived in upstate NY all my life, understandably snowstorms would account for my most memorable weather events. In particular, March 1984 when I had a hard time getting home from work, even though I only lived in Varna. Also, March 1993 (the first "Storm of the Century"). Unfortunately, if you check the Ithaca weather records for that storm, you will find "only" 15 inches of snow for Ithaca. The high winds make an accurate measurement nearly impossible. It was probably really somewhere between the 22 inches reported in Binghamton and the 42 inches reported in Syracuse.

Do you have any advice for aspiring meteorologists?

Take advantage of any electives you have to try to get a broad background. I took some computer and statistics courses as an undergrad that, at the time, I didn't think would be that useful, but have since proven to be a valuable investment. Since graduating, I've taken courses in areas such as maple syrup production and pomology, that have provided a great background for some of the Climate Center's research projects.

CCAMS Happenings Spring 2012

By Sarah Lynagh '12

This spring has been yet another busy semester for CCAMS! In January, several students attended the Annual AMS Conference in New Orleans, making valuable connections and learning a great deal about current topics in the meteorology world. The CCAMS Alumni Dinner in New Orleans was certainly a hit, and was a great chance to meet and connect with interesting, experienced professionals and academics that knew and loved Bradfield the way that we do today. We are excited to have a team participating in Cornell’s annual Relay for Life event on the weekend of April 20th, and hope to have a great time while raising money for a very vital cause. We have also been gearing up for Alumni Weekend, coming up on April 27th-29th (which you may be attending as you read this!) and hope to make this year’s Alumni Weekend the most memorable yet! In sports news, CCAMS has continued the recent tradition of dominating in intramural softball, with our team making it the playoffs yet again! Before the end of the year, we plan to have several more social events as a club, including a Bowling Night and a student-faculty dinner. It’s certainly been a busy and productive year for the club, and we truly hope to see that continue in years to come!
“To a worm in horseradish, the world is horseradish,” is the opening sentence of the book I was recently reading. If you are not interested in my adventures in NOLA, Jan 2012, take some time to think about this epic quote and you may flip over to the next page.

I thought. I thought, I know what I am going to do in meteorology. I thought. I thought, the 11th floor of Bradfield is the center of Earth. (Indeed, that’s a lie. Cornell is the real center of Earth.) However, I knew there is a lot more for me to explore in meteorology, so I signed up for the trip to NOLA. You always say yes when people ask you to skip classes. (Indeed, that’s another lie. I always say no.)

In the first section on the first day of the AMS meeting, Jase, an alumnus of the class of 2011, and I attended the same talk. It was a 15-minute talk on dispersion modeling in coastal environment, by Mr. William Thompson from the Naval Research Laboratory. He showed his findings by comparing different dispersion models in various terrains and time scales. The dynamic dispersion graphics surprised us. The particles moved randomly from the source by obeying the laws of fluid dynamics. It was fun to look at them! I personally grew up in a city and have great interest in urban meteorology, and was therefore totally fascinated. This stuff is really fun! I never knew urban meteorology is that fun! Even Jase, a young climatologist, was amazed too. I guess that is why we get education: to admire others’ contributions on new knowledge, and get new insights from them.

To be frank, I could not sleep well that week in NOLA. Not only the social events organized by Lindsey (and NFL on TV) occupied my leisure time, but also by reading the booklet of presentations’ list keep me away from sleeping.
I remembered the moments that Jase, John (who was a classmate of Jase’s) and I were searching for good talks from the booklet. “Oh, that sounds fun, I would go.” “Oh! Which one? Which page?” “Look! A Cornell alum is presenting tomorrow afternoon, let’s go!” The booklet was like an unlimited treasure to me that week. The only bad thing that could happen was that two great talks were held in the same time slot. Those tough calls are like choosing which sub to eat on FebruANY.

Every talk was a new adventure. The presenter tries to summarize what he/she has been doing in the past months in 15 minutes. You get exposed to new equations, new interpretations, new facts, new statistical methods…etc. Light bulbs all over your head, blink, blink, blink: maybe I should do this, maybe I need this perspective in my research, maybe this is my career… etc. What you think, mixing with what people did, coming up with what you want to do. New insights.

“See you in Austin next year!”

That was the closing slogan of the conference. Jase and John, two dedicated young scientists, have been participating to the conference for three years, and they are going next year too. If you are devoted yourself enough to meteorology and ready to gain new insights, it will never be too early or too late to join the next conference. I wish reading my little article will move you to fly to Austin next year, or, I wish this article at least made you smile.

“Del operator! Del operator!”
“Hello?”
“My fiancé and I have an emergency. We’re having a fight and might break up if you can’t answer our question!”
“Not many crimes or accidents today. What do you want to know?”
“Well, I’m not sure if… you can answer this exactly…”
“Please, take your time.”
“Are you the vector derivative of a scalar or the scalar derivative of a vector?”
[Pause] “Ma’am, I’m terribly sorry for your lack of mathematical knowledge. Good luck getting a job.” [hangs up]
[Silence in the house]
“It wouldn’t have mattered. If we can’t agree on something as simple as that, we’re probably not meant to be together.”
“You’re right. Let’s call off the wedding.”
“Now!”
[both] “REVERSE 911!”

Humor Break

By Colin Raymond ’14

Food is good stuff. I try to buy as much as I can. Organic and all that shit. But it’s like total gravity: it makes you bulge at the equator. I found a good solution, though. If I spin fast enough, the curve of my stomach looks straight, just before I pass out.
I’d like to start by saying that I deeply wish I could attend this year’s alumni weekend—my work schedule has gotten in the way! And while it is disappointing that I cannot attend, I am very grateful for the job I have just a stone’s throw away in Syracuse, NY. I had never envisioned myself as a broadcast meteorologist during my undergrad years (not that long ago—Class of 2010!), although I think some others had a sneaking suspicion that this is the business I would end up in.

Like many of you, when I first walked into Bradfield Hall, I was filled with excitement at finally getting to delve more into meteorology—a science that most (if not all) of us have been enamored with since a young age. I had hopes of becoming a “real scientist,” one who made important discoveries about tornadoes or hurricanes, one who could help build better forecast models and thus save lives from impending natural disasters. Upon responding to the typical freshman question, “What’s your major?” followed immediately by, “Oh, so you want to be on TV?” I would dismiss the idea without hesitation due to my preconceived notion that broadcast meteorology wasn’t nearly “important” or “scientific” enough. Maybe I had just seen Twister one too many times.

Fast forward to senior year… after the atmospheric dynamics, the thermodynamics, the multivariable calculus (why did I opt to take the Engineering version?), not to mention any type of computer programming… need I go on? Point is— it can wear on you. It would wear on anyone, even the best and the...
brightest. And that’s okay. It took a long time for me to accept that maybe I wasn’t the math and science whiz I thought I was in high school. It was a hard thing to realize that research and continued academia just weren’t up my alley, especially when I had so efficiently pounded the idea into my own mind that anything less would be failure.

Thus comes my first piece of advice to you, as students: don’t let your judgment about what you “should” be doing cloud over (pun intended) what you CAN do and are good at doing. Like I said, I think others realized that broadcasting was the right path for me well before I did, but I was stubborn, and didn’t want to give up on the idea that I could be good at something that felt virtually impossible for me to achieve. It was that inflexibility and pride that steered me towards feeling inadequate, rather than allow me to embrace the qualities that I should have felt abundantly confident in.

My next bit of advice is this: challenge is good, but don’t let it get the better of you. I fully endorse pushing yourself as hard as you can, but I also fully endorse listening to yourself and learning where to draw the line. Taking a step back or needing a break isn’t failure—it’s life. When you learn what you can and can’t take on, you grow as a person.

Look around you. It’s likely that you’re standing in a room filled with some of the most intellectual people you’ll ever meet. The wonderful thing about meteorology (besides tornadoes, nor’easters, etc. etc.) is that it is interdisciplinary in nature, which means while some of you may go on to perform atmospheric chemistry research or climate modeling, others may pursue careers in forensic meteorology, or emergency management. So whatever skill set you may possess, when combined with your love for the weather, you have plenty of options to pursue.

With that being said, I offer my final advice: go to the American Meteorological Society Annual Meeting. Chances are you will meet someone who has a job that you find interesting and could envision yourself pursuing. For me, it should have been a huge red flag when I found myself hanging around people who had jobs centering around meteorology communications, rather than those who worked on climate models at the conference. Chances are also that the contacts you make at the conference will help you out down the road. For example, had I not talked to a particular certified consulting meteorologist at the conference, I never would have landed a summer job after graduation, which then led me to meet a broadcasting meteorologist who is now my mentor, and helped inspire me to enter this crazy business.

Finally, with all of that being said, I now look back on my initial thought that broadcast meteorologists aren’t “real scientists.” True, we don’t employ much mathematics during our work hours. But chances are, we are the ONLY trained scientist an average person has “interaction” with on a daily basis. This may not be the path that I originally envisioned myself taking, but I feel proud and confident knowing that even if it isn’t by building better forecast models, I still have the capability to make a scientific impact on society.
Ten Questions with the Professors

By Greg Tierney ’12

What is your favorite weather phenomenon?

- Chen: Clouds. I especially enjoy watching clouds from a window of an airplane.
- Colucci: Snow, and lots of it.
- Degaetano: SNOW! Not the wimpy storms we have been getting lately, but the big 1-2+ foot storms we got here in the 1990s.
- Wysocki: Fog.

What is your favorite Cornell event?

- Chen: I have enjoyed all the events that I have attended at Cornell. It is hard to pick one...
- Colucci: Commencement. Hopefully I’ll be able to go to it this year.
- Degaetano: The Senior family get together thing the day before graduation. Outside of Atmospheric Science, I like being a townie at Lynah.
- Wysocki: Spring break.

Which classes do you most enjoy teaching?

- Chen: Climate Dynamics. I like this class because it covers both fundamentals and discussion on recent climate debates.
- Colucci: Synoptic II. I’ve been teaching it since before you were born, but never the same way twice.
- Degaetano: Definitely Thermo. I like teaching the first real mathematical Atmospheric Science class.
- Wysocki: All of them.
### What is your favorite TV show?

- **Chen:** I like comedies like “Friends” or “Seinfeld”.
- **Colucci:** I don’t watch television.
- **Degaetano:** Big Bang Theory (hopefully I don’t remind anyone of the characters). I also like Diners, Drive-ins, and Dives.
- **Wysocki:** NCIS (currently), Star Trek (in the 60’s).

### What is your favorite movie?

- **Chen:** I like most of Woody Allen’s movies.
- **Colucci:** I don’t go to movies, either!  
  [Author’s Note: Sources say that “Cheech and Chong’s Up in Smoke” is his favorite movie]
- **Degaetano:** Groundhog Day.
- **Wysocki:** Stagecoach.

### What is your favorite band?

- **Chen:** A Chinese rock band called Beyond.
- **Colucci:** All of my favorite bands have retired, even my favorite “modern rock” band REM.
- **Degaetano:** No real favorite band.
- **Wysocki:** Moody Blues.

### What was your childhood dream job?

- **Chen:** I wanted to be an inventor.
- **Colucci:** Marine biologist (I’m not making that up).
- **Degaetano:** I always wanted to be a farmer. I guess that’s why I live next to a dairy farm and have a garden.
- **Wysocki:** Naval ship captain.

### What is your favorite hobby?

- **Chen:** Reading novels. My favorites are fantasy and science fiction, although most of the novels I have read were written or translated into Chinese.
- **Colucci:** Gardening.
- **Degaetano:** Depends on the season.....Reffing soccer, gardening, and skiing.
- **Wysocki:** Model Building (ships/planes).

### Do you call carbonated beverages "pop" or "soda"?

- **Chen:** Soda.
- **Colucci:** Beer.
- **Degaetano:** Beer.....oh, that’s not on the list. Soda.
- **Wysocki:** Neither, it’s Soda Water.

### What is your favorite color?

- **Chen:** Blue.
- **Colucci:** Green.
- **Degaetano:** Green.
- **Wysocki:** Blue.
Weighing career options in meteorology can’t really be undertaken without also considering whether or not to pursue a graduate degree. Certainly, if your final career goal is to be the leader of a research group or a professor, then a Ph.D. is a must to be considered for a position at most institutions. If your goal is outside of those, then the decision can be a little less clear. However, here’s some food for thought: from 1994 to 2004, the number of bachelor’s degrees awarded in atmospheric physics, meteorology, or atmospheric science increased by 47%, to 567 students per year (Knox 2008). According to the Bureau of Labor Statistics 2010 outlook, when excluding attrition the number of jobs expected to be added to the field over the next decade is about 1,000 – just 100 per year, including jobs that require graduate degrees. Knox noted that although less than 30% of graduating undergrads go on to grad school, 57% of meteorology-focused job openings over a two-year period required a graduate degree. From an occupational standpoint, a graduate degree offers a greater opportunity to obtain a job in our increasingly competitive field.

That being said, a graduate degree is not without its opportunity costs. A master’s generally takes two years, doctorates at least four. You fall into a role of “half student, half employee”, and while most strong candidates will have stipends to cover expenses, they are not lucrative, averaging around $20,000-25,000 per year. Any grad student can tell you a number of “horror stories” from working on frustrating research in the middle of the night. But grad school isn’t meant to be an end result, but rather a way to an end result. The successful grad student will conduct research independently and be able to communicate their research to an audience, and ideally, publish their work with the guidance of their adviser. Grad school offers a deeper understanding of not only the science, but of higher-level math, physics and computer programming. These skills and traits make for a stronger job candidate, especially for those pursuing operations or research. In conclusion, for those seeking a competitive edge or to gain access to a wider swath of meteorology jobs, a graduate degree is key.

I had the amazing opportunity to attend the AMS Annual Meeting in New Orleans this January, and have nothing but good things to say about the whole experience. As a second-time AMS Conference attendee, I felt much more comfortable navigating the conference (which can be quite overwhelming your first time). With the job search in full swing, I felt much more comfortable approaching people just to chat or to ask for their contact information (which everyone is happy to provide). The conference actually proved to be a great jump-off point for making some good connections. I had the chance to attend some very interesting talks, which then gave me an “in” to contact the speakers after the conference. One of these post-conference emails, in particular, led to many more connections and great conversations with people in our field who I would (most likely) never have had the chance or privilege to speak with otherwise.

The conference was also an excellent chance to connect with my peers from other schools. While this may seem insignificant now, I believe that the connections I have made over the past two years with other students in meteorology will be some of the most valuable connections to have during my career. Multiple people have shared their insight with me, reminding me that since our field is fairly small and contained, the same faces tend to show up throughout your career. This means that the friends I have made in this field will not only be good friends, but they may also be important connections further down the line, which makes my experience at the conference seem even more worthwhile.

The conference also opened up a lot of opportunities to explore options within our field. I am very interested in the societal impacts of weather and climate change, and was therefore thrilled to have
the chance to attend the WAS-IS (Weather and Society Integrated Studies) reception one evening and talk to members of the mission. These kinds of opportunities are, in my opinion, the most compelling reason to attend the conference. While the conference sessions themselves are interesting, the talks are not necessarily intelligible to the average meteorology undergrad. The networking opportunities that abound at the conference are the real reason to attend. Having the opportunity to talk to people in your field is invaluable, and can only be reaped on a small scale within the confines of the eleventh floor of Bradfield.

This year, I also had the privilege to present my summer research at the poster session for the Student Conference. This was a great opportunity to practice more informal public speaking, and was also just plain fun! I really enjoyed telling people about my work and it was definitely exciting to see people interested in my topic.

All in all, the AMS Conference was an amazing, exceptionally fun, and interesting adventure, and I highly recommend that you make the commitment to go at least once during your undergraduate career. I promise that you will not be disappointed if you go in with an open mind!

What Happened to the Winter?

By Jordan Vartanian ’13

One question has been bothering me for the past few months. What happened to our winter here in upstate NY, and for that matter, most of the US? Oh what a winter this has been, from the US experiencing its fourth warmest winter on record (be honest, wasn’t it nice?) to Eurasia and parts of Europe seeing some of their coldest temperatures on record. People in the US (especially the eastern half) were probably wondering where all the snow was, while citizens over in Eurasia witnessed the third largest degree of snow cover on record in February. In fact, more than 650 people died in this area of the world as a result of all the winter weather records that were being shattered. Now, I have heard lots of questions being thrown out there to describe what has been going on. Is this normal? Is it due to Global Warming? Hopefully, I can answer some of your questions and finally give you some peace of mind that this warm weather may not be directly related to that new Hummer you just purchased.

Right now, the entire globe is under the influence of two phenomena that affect the synoptic patterns across our continent. One of these phenomena, called La Nina, is probably familiar to most people. La Nina, the counterpart of El Nino, comprises the El Nino/La Nina-Southern Oscillation (ENSO). The ENSO is a climate pattern that occurs roughly every five years. Without going into too much detail, this creates extreme weather across our country. It is believed to have brought the drought conditions that Texas and parts of the Southern United States are seeing. In addition, it contributed to the wild temperature fluctuations that the US has seen over the past few months.
An equally contributing culprit of the wild temperatures that the globe saw was a lesser-known, but ever-present event, called the Arctic Oscillation. The Arctic Oscillation is always fluctuating between various phases. The difference between the positive and negative phase of the Oscillation can make a huge difference. A negative phase results in the jet stream moving south and bombards the surrounding areas with cold, frigid air from the Arctic. The strong negative values that were present over the last two winters contributed to the large snowfall and cold temperatures that we have seen. The Arctic Oscillation hasn’t changed much since November and we have seen colder air trapped above us, while record breaking cold spilled into Eurasia.

Now, scientists are expecting La Nina to dissipate by the end of April. That’s good. It is supposed to fluctuate. All seems normal and it seems like scientists have a pretty good grasp of what is happening. But at the same time, I think it is worth putting into perspective all the records we have broken this winter. The US set many new temperature and precipitation records, since the time that formal record keeping began in 1880. The biggest question to ask is why was this winter so extreme? We have seen positive Arctic Oscillation values and have experienced La Nina. Why was this winter so special? Well, that is a question I’m sure scientists will be spending many years trying to figure out.

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Beyond the CCAMS

By Maureen McCann ’02

Ten years later, I'll admit, I'm still on the CCAMS-L email list. I can't bring myself to unsubscribe. I like to keep up with all that's happening on the 11th floor, and I like seeing the direction the club is going now that I'm 10 years removed from it! A recent email told me there was a need for Ithacation articles this month, and I thought to myself, maybe it's a good time to submit something. After all, it has been nearly a decade since I probably wrote an article.

Yikes, 10 years. I graduated from Cornell in 2002. I was active in the CCAMS serving as Co-President my senior year. This was the start of my involvement with the American Meteorological Society... actually, my interaction with them dates back probably to age 10 when I used to write letters to 45 Beacon Street in Boston asking for them to send me any sort of weather pamphlet in the mail. I'm sure some of you did the same thing!

Since my days at Bradfield Hall, I've been an officer in several local chapters in the markets I've worked in, and I'm currently on the AMS Board of Broadcast Meteorology. I evaluate CBM applications for those applying for their seal. Once you are working as a meteorologist, you can apply to volunteer on dozens of boards, so if TV isn't your thing, there are so many others. It's a great way to get involved in your field beyond your physical workplace. Typically, it doesn't require much of your time, just a few conference calls here and there. Once you're out into the "real world" you may want to check it out! Visit
Visit www.ametsoc.org/amsvolunteers/index.html to learn more about boards and committees.

By serving on the Broadcast Board, it led me to be a conference chair. It kind of reminds me of my days planning CCAMS events (I believe Alumni Weekend stemmed from our class, but don't quote me on that!) I'm in my second year of co-chair of the upcoming 40th Annual AMS Conference of Broadcast Meteorology, to be held in my hometown of Boston, MA from August 22-24. This conference is geared specifically to the broadcast mets, so the presenters typically speak of case studies, special weather coverage, and breakthroughs in tv weather technology. With social media becoming such a vital platform in this realm of meteorology, particularly during severe weather events, there also will be special emphasis on this topic at the upcoming meeting.

The dates of the Broadcast Conference may coincide with the start of classes, but I strongly encourage attending, if you are interested in going into television! Often times, the AMS offers student travel grants to attend some of these specialty conferences. Visit www.ametsoc.org/amsstudentinfo/stg_info.html for more information! Many of you have already attended an annual meeting; the 2013 one is planned for Austin, TX... I hope to be there!

The AMS is a wonderful platform to interact with peers who have the same interest is you. It also gives you a chance to connect with other Cornell alumni. Take advantage of the student membership pricing while you can!

With the semester winding down, many of you may be seeking internships and jobs for the upcoming summer. The AMS job board (www.ametsoc.org/careercenter/index.html) is a resource that could lead you in the right direction. The National Weather Association (nwas.org/jobs.php) offers something similar.

Finally, utilize your alumni connections and feel free to reach out to me or any other grad! Hope to see you at a conference someday!

2012 Mesoscale Meteorology class on CCAMS dress-up day. Photo provided by Joseph Lee