CCAMS Forecasting: Full Throttle by Johnathan Kirk ’11

One of the main activities CCAMS has long been involved with is forecasting. We offer a variety of opportunities for students to gain experience forecasting for Ithaca and across the nation. Students forecast for Cornell sports teams, publish their predictions in the Cornell Daily Sun, and even put their skills to the test against their fellow classmates in the department forecast contest.

In addition to these activities, CCAMS partakes in forecasting for the public and the national forecast contest. This year, CCAMS WeatherPhone and the WxChallenge are enjoying revitalized interest and popularity. We made a few changes this year to renew interest in these activities and it is my pleasure to report that they are both flourishing as strongly as ever!

CCAMS WeatherPhone has long provided an integral service to the Ithaca community. To demonstrate our commitment to this service, we implemented some changes to replenish student interest in forecasting for the WeatherPhone. For the Fall 2010 semester, Jase Bernhardt and I introduced a new course, EAS 4940: Weather Forecasting for the Public, for students to enroll in for credit. In so doing, students get hands on experience forecasting for the Ithaca area, with a team dynamic. Students work together and with their TAs to learn new forecasting techniques and gain a feel for the weather in Ithaca. Our diverse team of 16 forecasters also read their forecasts onto the WeatherPhone. Additionally, students verify their previous forecasts, so as to learn from the past to improve future forecasts. They receive feedback from their TAs on their current forecasts and their recordings. Students develop their forecasting skills that can carry over to forecast contests as well. Numbers are up and WeatherPhone is now staffed 6 days a week with at least 2 forecasters working each day.

A few years back, the national forecast contest, WxChallenge, started out of the University of Oklahoma. Cornell was quick to join on and had active participation each year. This year, however, thanks to renewed interest in forecasting, we have the largest participation we’ve ever had. Cornell has, for the first time, fielded a team with a whopping 13 forecasters! But if that weren’t enough, Cornell as a team is doing extremely well in the standings. As of print time, Cornell ranks 6th out of 53 teams! Clearly, the quality forecasting from the department contest has translated over and is paying off in dividends.

With the great pride I take in making these announcements, I must also take the time to sincerely thank all of those who are participating in these, and all forecasting activities. People really do count on our group, and I believe that we continue to deliver year after year. It is your interest and motivation that keeps these activities alive and well. I hope we continue to flourish and will work to increase participation even more. Thanks for the great work, and keep it up!
This past summer I decided to stay in Ithaca, not only to enjoy the few months of good weather each year in Upstate New York, but also to participate in two atmospheric science–related endeavors.

I spent a few hours each week holed up in Bradfield, analyzing a dataset of East Coast Winter Storms which have occurred during the past sixty years. These storms are important to winter weather in Ithaca and across the Northeast as they bring heavy precipitation, winds, and coastal flooding to the region. Specifically, I investigated slow-moving East Coast Winter Storms. These are even more problematic as they bring adverse weather for an extended length of time. After writing a program to identify which storms moved particularly slow (or not at all) during their lifetimes, I began to look into some causes for this slow storm movement. Factors analyzed included the El Niño/Southern Oscillation phenomenon, North Atlantic Oscillation, and upper-level jet stream pattern. This research is ongoing and I will be presenting my work at the AMS Annual Meeting in Seattle this coming January.

In addition, while I wasn’t toiling away on the 11th floor of Bradfield, I volunteered at the Binghamton National Weather Service Office twice a week throughout the summer. I gained invaluable forecasting experience from this position. Once I received basic training, I was allowed to assist with the creation of numerous forecast products, including Area Forecast Discussions, Zone Forecast Products, Terminal Aerodrome Forecasts, and even Severe Thunderstorm Warnings. Towards the end of the summer, I also completed a mini-research project on snow forecasts in the Binghamton office’s county warning area.

All in all, it was a great experience volunteering at Binghamton, and I would encourage anybody who may be interested in forecasting to pursue a similar opportunity at any National Weather Service office.

This past summer, I was fortunate enough to continue my internship from freshman summer with the New York City Department of Environmental Protection as a financial administration assistant. Although the internship itself had little to do with meteorology, it opened doors to future research.

Last fall was my first semester at Cornell, and I decided to take the opportunity of participating in undergraduate research. My research was conducted alongside Dr. Stephen Shaw, a post-doctoral candidate in EAS, and under the advisement of Dr. Susan Riha. The study was of the New York City watershed system that provides millions of gallons of drinking water to New York City each day. The project started off by trying to answer one question: ‘Does the intensity of precipitation impact the amount of turbidity found in the water?’

Turbidity is the amount of suspended substrate that is present within a given sample of water. Turbidity lowers the overall quality of water, and gener-
ally, is not something desired by water providers. It was originally thought short, intense periods of rainfall would yield the highest turbidity result due to the physics behind heavy precipitation. However, by using CLIMOD archives as well as archived rain gauge data for the study area, we were able to eliminate the connection between heavy precipitation and turbidity. This caused us to look at other components of the data and seek out unexpected relationships.

Currently, we are focusing most of the attention on the load vs. rainfall intensity relationship. There is a strong correlation with total precipitation and load, so it is interesting to incorporate the possibilities of climate change and what socioeconomic implications it would have to watershed systems around the U.S. Though the project is not yet complete, significant progress has been made, and I am confident that the final results will be helpful towards bridging our knowledge between precipitation and watersheds.

New England Elevated River Flows Project
by Johnathan Kirk ‘11

For the past several months, I have been involved with a project through the NRCC to investigate the weather causes of elevated river flows in New England. Given the maximum precipitation total data for each year from as early as 1904 to 2005, storms were categorized on the synoptic scale based on general geographic proximity. Categories included, among others: Coastal Lows, Cut-off Lows from the Ohio River Valley to Canada, and Tropical Cyclones.

The initial broad categorization of each storm is to be narrowed and the definitions, fine-tuned so as to more accurately reflect each storm’s dynamic characteristics. Once sorted, the trends in storm type frequency were analyzed at each of 10 river gauges across New England. This method will later expand to include river gauges in Eastern Canada, as well. While I’m currently working on the statistical analysis, it is quite clear already that Cut-off Lows tend to be the most directly responsible cause of elevated river flows than any other synoptic storm.

Of note, this project is in coordination with other NOAA personnel. The original idea came from a Hydrologist at the National Marine Fisheries Service. In need of analysis from people with more of a weather background, he sought the aid of meteorologists at various agencies. As a result, meteorologists at the NCDC are working on the smaller scale causes of each event, focusing on causes such as snowmelt and runoff. The synoptic cause analysis went to the Northeast Regional Climate Center, where I came on board. The project continues and will focus more on trends in climatology at both the synoptic and the smaller scales.

This project has been quite enjoyable for me, because it involves climate data collection and analysis, in addition to practical applications relating to other elements, beyond weather. It is a good example demonstrating how weather impacts other scientific fields. I look forward to continuing to work on the project and I aim to present it at some upcoming conferences.
Climate Research and Soccer: My Trip to South Africa
by Daniel Metcalf ‘13

Before my 23-hour flight across nine time zones and over the Arctic Circle, I had little idea about what to expect from journey to South Africa. I knew I had an internship at the University of Cape Town with a climate research organization (Climate Systems Analysis Group), two tickets to World Cup games, and a house to live in. I knew it was winter in the Southern Hemisphere and Coriolis Force caused low pressure systems to rotate clockwise. I had little idea that the next month and a half would become the greatest month and a half stretch of my 19-year-old life.

Amongst the five World Cup games (yes, I caught World Cup fever and indulged myself with three more games), shark cage diving, skydiving, bungee jumping, hiking, camping, volunteering, cycling, and the constant commotion surrounding the games, I worked for Climate Systems Analysis Group at the University of Cape Town.

First off, the general culture around work was a culture shock. My 9-5 day I had envisioned quickly became a 9-3 day with tea breaks intertwined throughout. I know, it was a tough adjustment to make but someone had to do it. CSAG is what we in the US would think of when we think of the NCDC. They run global and local climate models ranging from 3 months to 100 years out. My work consisted of validating and critiquing the past runs of their past 3 month global temperature model for years 2008 and 2009. Using the program Grid Analysis and Display System (GrADS), I wrote scripts that would compare the CSAG’s 3-month surface temperature model to the observed global temperatures produced by NCEP. Learning the process of writing scripts took up the first half of my internship. However, once I figured out the process I was able to contrast the past two years with the NCEP maps.

After switching between surface temperature and 3 meter temperature my analysis showed that the CSAG model was consistently forecasting the poles to be 5-10 degrees Centigrade too cold and was forecasting waters off the coast of Chile to be too warm. CSAG is now altering their input equations to compensate for these findings.

My time in South Africa was an experience of a lifetime. I was able to study in the field I love while learning about an entirely new culture and witness a sporting event second to none. Getting a double dose of winter and the horrific flight was worth seeing a different end of the spectrum. And besides, I’m from Portland, Oregon, a little rain, and mountain snow believe it or not, couldn’t dampen my trip.

A Sunburned Meteorologist by Aaron Perry ‘11

Have you ever thought of traveling the world?

How would you like to see the Sydney Opera House, visit the Korean demilitarized zone, feed a kangaroo, or get served a tasty, but unidentifiable drink in Seoul? (It turned out to be a rice drink, highly recommended)

Last year I got to do all of these things and more! I spent a semester abroad at the University of Melbourne in Australia, and had the time of my life. I stayed at the residential Queen’s College, which was an experience on its own merit. I walked on and trained with the Queen’s College rowing team. They had more events going on than I knew what to do with, with everything from social events to dinners to tutoring sessions to help out with classes. One of the best things about living in Queens was that I was living with mainly Australians, with a few other exchange students mixed in. Oh, and did I mention that every room is a single?

Outside of Queens College, MUSEX, the Melbourne University Student Exchange Society had even more going on geared towards exchange students from all around the world. Pub crawls, footy nights (Aussie Rules Football is an intense game!), dinners, wine tours and cruises are all on the docket of MUSEX events.

Even academically this was one of the most interesting semesters I’ve had. NONE of the classes I took in Melbourne are offered at Cornell, and covered everything from the weather and climate of Australia to a brief history on everything Australian (with a GIS class thrown in somewhere).

Even though Melbourne was my
I was able to travel all over the place. I did a lot of traveling in the state of Victoria, including the 12 Apostles (there aren’t 12 of them), Phillip Island (Penguins!!), and a wine tour through the Yarra Valley (Tip #1: If you drink the wine, never buy the wine at the end of the tour...trust me on this, it’s not nearly as good as you think). I even learned how to surf, but be careful; Australia lost a Prime Minister in those waters.

I was also able to travel to Tasmania (An Australian state, NOT a country...apparently people get confused); Sydney; Auckland, New Zealand (Tip #2: No matter how early it is always look at your ticket before a rushed New Zealander herds you on a bus!); and South Korea (It’s impolite to refuse anything offered to you, which is more of a warning than a tip. Also if you’re the only American in the audience of Nanta, you might get married...the pictures are somewhere on Facebook.)

Being Cornell students, we have an amazing opportunity to go abroad and have the adventure of a lifetime! Sometimes people are weary because of the time away, or the cost, or even because they think they need to learn a new language. In reality going abroad is a lot easier than most people think, and the work you put into going abroad is repaid 1000 fold.

First of all, Cornell will always be here and will continue on without you. Yes, you’ll miss some things, but it’s easy to stay in contact, and to be honest it will take you a while before you even think of being homesick. Most of your friends will probably be more jealous of you at the Great Wall of China while their off taking a prelim than the other way around.

Next, the cost; going abroad is usually cheaper than a semester at Cornell, airfare included. You’ll also get financial aid while abroad, and if you’re a New York state resident you just pay Cornell like you normally would. There are also scholarships and fellowships you can apply for.

I’m not sure if many people in our major are fluent in other languages, but even if English is your only language there are still dozens of institutions in England, Australia, New Zealand and South Africa. There may also be American universities in other non-English speaking countries that have classes in English.

In fact, the hardest part about going abroad is deciding where you want to go and what classes to take. So, find a map and choose a place to go to. With a little work from you the CU Abroad office will make it happen! If you need any help, contact me [atp42@cornell.edu]. This applies whether or not I’m still a student when you read this. Going abroad was one of the best experiences of my life and I’m still learning from it, and I would be thrilled to help someone gain that same experience.

- If you are interested in traveling to Australia specifically, I’d recommend reading “In a Sunburned Country” by Bill Bryson.
When I was ten I decided in no uncertain terms that I wanted to be a meteorologist. I’m not sure how I first came to this realization. Maybe it was the way I obsessively checked the weather every ten minutes. Or it could have been the way I spent my summers tracking hurricanes; that might have tipped me off. In any case, by the age of ten I was hooked on weather, seemingly for life.

When I got to high school, my task became to find a college where I could further my dream of being a meteorologist. Initially, I only looked at public schools. I had seen the kind of price tags that private schools usually have, and that scared me off. I could not in any way, shape, or form, afford a $50,000 a year school.

So I toyed with a few public schools for a while. I’m from California, and I looked at the three schools in the University of California system that offered an Atmospheric Science major. However, as I visited their Atmospheric Science departments, I grew discouraged. Each department looked rather underfunded, and didn’t offer very many actual classes about weather. In fact, some of them were considering eliminating the Atmospheric Science program altogether, in favor of a larger Environmental Science major (one school later did this). That wasn’t what I wanted. And the tuition to these schools was by no means cheap either.

I looked at some out-of-state public schools that were renowned for meteorology, but the tuition to those was astronomical. Not to mention that several of them turned up on the Princeton Review’s Most Beer Consumed Per Capita list.

Then one of my friends explained to me about financial aid at private schools. She said that private schools offer much more aid than public schools, so that even though their sticker prices are really high, students often end up paying substantially less. Suddenly, a whole range of new possibilities was open to me. I began looking into private schools too, trying to find the very best Atmospheric Science program I could. And then I discovered Cornell.

At last, here was an Atmospheric Science program that actually looked as though it took weather seriously, and seemed to have been created by people who cared as much about the subject as I did. It encompassed an entire department devoted to accurately tracking and predicting Ithaca’s weather, lots of great research opportunities, and even a local chapter of the American Meteorological Society (yeah, CCAMS!!). Best of all, I could get started with taking weather-related classes right away, instead of having to wait two years to finish general education classes.

And now I have been at Cornell for an entire month, and I wouldn’t trade it for anything. I am taking classes about weather, doing community forecasting, and I even have a job with the Northeast Regional Climate Center. I am well on my way to achieving my dream of having a career in meteorology, just as my ten-year-old, weather-geek self planned so many years ago.
CCAMS Intramural Sports Update by Jase Bernhardt ’11

Last semester, after a few years off, we decided to resurrect our CCAMS intramural sports program. The club entered a softball team into the co-recreational (co-ed) division. After a slow start, the weather warmed up, and so did the team, as we won our final two regular season games to even our record at 2-2 and earn a playoff spot. Then, in the playoffs, despite being seeded 19th of 20 teams, the CCAMS squad went on an improbable run, winning two playoff games to advance to the quarterfinals. Unfortunately, we fell in a tight contest, but still ended the year with 4 wins against 3 losses. The season on a whole was a great success, and although a few important members of the team graduated, much of the core remains intact, so expectations are high for this coming spring.

Building off our success in softball, CCAMS launched its first-ever intramural flag football team this fall, again in the co-rec division. Dubbed the "Alberta Clippers" our squad has been competitive thus far, and at press time, holds a record of one win and one loss. Stay tuned for the results of the football season, and for next semester, when we hope to have our inaugural CCAMS basketball team, and bring back the winter staple - intramural bowling.
Q: **What got you interested in meteorology?**
   A: Lightning. I used to sit on the porch with my Dad to watch thunderstorms. Lightning has always amazed me.

Q: **Which University did you attend as an undergraduate, and what was your major?**
   A: I went to the University of Arizona as a major in both Astronomy and Physics.

Q: **What made you decide to do that?**
   A: This is going to date me, but Sputnik actually. I was six years old when Sputnik was first launched into space. I got a telescope, and spent a lot of time looking out into space. From there on out, I got really into astronomy.

Q: **What were some of your favorite classes as an undergraduate?**
   A: Advanced physics lab and Spectroscopy.

Q: **Okay, you’re going to have to explain.**
   A: In advanced physics lab we got to design our own experiments during our second year. I found that to be a lot of fun and hands-on. As for Spectroscopy, we spent a lot of time looking at the spectrums given off by particular gasses. You can gain a lot of information about a galaxy just by looking at its spectrum. For example, you can discover the composition of gasses merely by looking at its spectrum. I really enjoyed how that related to astronomy.

Q: **Ha. I guess chemistry and physics lab are good for something. What did you do after undergrad?**
   A: I went to the University of Wisconsin, Milwaukee to get a Masters degree in Meteorology. I had a whole outline of my Master’s Thesis written out before I left in 1980 to teach at the Science Center in Avon, Connecticut. I also accepted a part-time job in broadcasting for NBC’s Hartford, Connecticut station. I did this until 1983

Q: **Any interesting stories from television?**
   A: Mostly just a bunch of bloopers. Back then, with the lack of technology, they had roll-out magnetic boards that we used to have magnetic symbols for and whatnot, to supplement the green screen. However, the magnets often fell off in the middle of a live broadcast. It’s pretty difficult to keep a straight face when everyone in the room is laughing their butts off.
Q: Magnets, ay? You worked at the Science Center and broadcasted until 1983. What did you do after?

A: I accepted a job at SUNY Oswego as a meteorology instructor in the earth sciences department. I still hadn’t received my Master’s Degree.

Q: When did you get on that?

A: From 1986 to 1988 I finished my Master’s Degree at Cornell, all the while still teaching at Oswego. In 1988, I accepted a position as an instructor at Cornell.

Q: You’ve worked your way up to Senior Lecturer. You’re also pretty involved in Roberts Hall. How did that all begin?

A: In Roberts Hall, I got involved with the Curriculum Committee. One thing led to another, and now I’m the chair of the Curriculum Committee. I signed a contract for five years, and I’ve been there for six and a half. Needless to say, I’m ready to recommit myself to only teaching again. I like the progress we’ve made for CALS, and I feel that it has helped the students. However, I miss the time with the students and I’d like to become more involved with them again.

Q: I just received my worst grade ever at Cornell on a math midterm. What’s the worst you’ve scored on a test in college?

A: I know how you feel. I once got a 9 on a test for a 300-level physics, electricity and magnetism course. Out of 100, I got a 9. Since then, I knew I wanted to become a teacher in science education. I don’t want students to get 9’s on my exams.

Q: Just out of curiosity, how many times a day do you check your email?

A: [chuckles] I check it whenever the damn thing bounces up and makes a noise on my computer. The better question for you to ask is how often do I respond.

Q: How often do you respond?

A: Seldom. I’m working on it.

Q: So how long do you want to do this for?

A: I could teach until the day I die.
Be sure to check out our awesome updated website!
http://ccams.eas.cornell.edu/

Thanks so much to everyone who contributed to this issue of *Ithacation*,
and thank you to all the CCAMS chairs for your hard work thus far this year!

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