This fall, CCAMS has been busy networking, forecasting, and, of course, socializing!

On September 29th, CCAMS and the Student Association for Science of Earth Systems hosted a career fair with members of the EAS Advisory Committee. The career fair was a great opportunity to chat with professionals in our field and to learn about the wide range of career paths that our major offers in the post-graduate world. The Committee members were all extremely friendly and eager to chat with us, which made for an enjoyable evening in Bradfield 1102! Among the attendees were Frank H. T. Rhodes (of Rhodes Hall on the engineering quad!), Randall Dole of NOAA's Climate Diagnostics Lab, and many others. Underclassmen as well as upperclassmen found this event both interesting and useful, and hopefully it will become a CCAMS & SES tradition in years to come!

On October 13th, CCAMS also hosted an internship seminar, during which upperclassmen spoke about their summer internship experiences. Several seniors and juniors presented, including Lindsey Cohen ’12, who interned at Weather Services International, Kevin Forney ’12, who interned at NBC Hartford, and Joseph Lee ’13, who interned at the World Meteorological Organization in Geneva,
Switzerland.

On the forecasting front, WeatherPhone, the Forecast Contest, and the National Weather Challenge are well under way with high participation!

And, as we all know, CCAMS wouldn’t be CCAMS without some good old-fashioned fun!

Currently, CCAMS has a team in the Intramural Flag Football league, and just made it through the first round of the tournament! As a club, we have also had a few weekend social events, and are in the midst of planning a Freshmen-Senior Night as well as a Thanksgiving Dinner! We are lucky to have a very vibrant, involved group of underclassmen, so there will be no shortage of fun events this year!

That’s the update for now…we look forward to many more exciting events for the rest of the semester and the year!
Interview: Ken Rancourt
Director of Summit Operations at the Mount Washington Observatory

Interview by Molly Smith

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

I was fortunate enough to be going to college in Iowa, and to earn money I took a job with a professor in Earth Sciences (where the Meteorology program was housed at the time). My job was to go out into the field and measure rainfall accumulations after every rain event. This was my first exposure to meteorology, and as the research programs that I worked on got more interesting I changed majors to meteorology. An in-depth analysis of those rainfall records eventually became the focus of my Masters thesis.

Why did you start working at the Mount Washington Observatory?

After completing my BS in Meteorology, I went on for an MS at McGill University in Montreal. Finding a job in meteorology was harder than I anticipated (air pollution studies were popular at the time, but I didn’t do particularly well in chemistry!) and on the weekends I started hiking in the White Mountains. While on one hiking trip to the summit of Mt. Washington I stopped in at the weather station, asked some questions, and left with a job application. Around six months later I received a call for an interview. That was in 1979.

You are the Observatory's Director of Summit Operations. What exactly does that entail?

As the Director of a weather Observatory located on top of a mountain, the majority of my responsibilities revolve around logistics and facilities management. I am heavily involved in research project management (we have two research programs now: one studying the effect of climate change on the Alpine Zone, and another dealing with satellites, modeling, and icing), personnel management, transportation issues, and scheduling.
What's it like being a meteorologist in such an extreme environment?

To some degree, a job at a mountain top observatory for a meteorologist can be described as a ‘dream job’. Observing the weather is one thing, but understanding what is happening right in front of you is quite another. It gets your brain thinking: understanding the fine scale dynamics of clouds, measuring cloud drop sizes, and working with meteorological sensors (some high tech and some low), are all part of the daily routine.

What's life like at the summit?

Although it is tucked on top of a mountain, and is quite isolated for most of the year, the summit Observatory is a very busy place. Researchers come and go, our educational programs bring over 200 people to the summit for an overnight stay during the winter, and representatives from the media pop in and out numerous times during the winter season. And we still have our observations and research work to complete.

Mt. Washington is famous for being the Home of the World's Worst Weather. Do any weather events in particular stand out in your memory?

One thing about weather on the summit is that it seems that you never get a repeat of the same conditions from day to day. Conditions are always changing. In speaking of extremes, the highest winds that I have been outside in have reached about 187 MPH. That was truly memorable, especially as I was experiencing it in a perfectly safe environment, and realizing that I could go back inside whenever I wanted to.

Is it true that a good number of your winter interns end up doing research in Antarctica?

Yes, I can think of almost two dozen former staff members who have either worked at the summit and then moved on to work ‘on the ice’ or the other way around. I know three former staff who are there right now. Mount Washington is a great training place for these folks.

Do you have any advice for meteorology students who want to work in extreme conditions?

Unfortunately, there are not many high altitude Observatories around anymore, so the number of positions available are quite limited. However, to get at least a taste of what conditions are like at these places, an internship is a great way to start. Perhaps not surprisingly, some former interns have eventually been offered full time positions at the Observatory, while others have used their experiences to decide on their future educational efforts: some have gone on for Masters or PhD’s in meteorology or an allied field; others have decided that they were really more interested in other topics and changed to statistics, climatology, or the study of air pollution. Internships are a great way to expose yourself to a potential career.
Well, there come times when things just don't go your way, and my plans for the summer of 2011 definitely fell into that category. After sending about half a dozen applications out for different REU's and internships, I found myself in mid-April with no affirmative responses. So it came time to look for something new. Sure, I could work as a janitor at my high school or volunteer at a local science center like I had the summer before, but I really wanted to do something that was more directly connected to meteorology. The answer? An internship at NBC Connecticut with their weather team.

After submitting an application I quickly heard back from the chief meteorologist, Brad Field (a little too funny for us Cornell meteorology majors, isn't it?), who expressed his excitement at having a Cornell student who loved forecasting as an intern. The whole experience really kicked off for me with an interview in which I sat on set with Brad and talked about what I was hoping to get out of the internship; no broadcasting, but tons of forecasting experience. From this meeting, my next experience was orientation with all interns at NBC Connecticut. Surrounded by 20 aspiring broadcasters, I really felt out of place, and to have to admit that I was just there to pick up some forecasting experience really made me feel awful.

So this all should have lead to me starting in early June, but with what was proving to be a cloud of bad luck (pun intended) following me, my paperwork for security clearance was lost and the chief meteorologist's mother passed away. All this led to me not being able to start until the end of June.

Thankfully, from then on the experience was beyond anything I could have hoped for. In my two months with the weather team I got the opportunity to work alongside some of the TV personalities who inspired me with their ability to be informative, scientific, and yet entertaining as well. Also I was on
Greetings from our nation's capital! My name is Tony Fracasso '02 and I work as a forecaster for the Hydrometeorological Prediction Center (HPC) in Camp Springs, MD (just outside Washington, DC). We are mostly responsible for the precipitation forecast for the lower 48 (including snow) but also short and medium range forecasts for surface fronts and surface analysis. HPC is generally not a place one can get to right after college. And while there's no specific formula to get in, generally a master's degree or at least a year or two experience (like as an intern at an NWS office) can get you an interview. It sometimes comes down to plain luck when applying as you never know who else applied and how much (or little) experience they have compared to you.

In the meantime, gain as much experience as you can over the summer (see www.usajobs.gov/studentjobs/ for summer opportunities in the government, or www.ametsoc.org/amsstudentinfo/internships.html for other internships). Also check the website of your local NWS office since they sometimes post summer intern positions. If anyone is in the DC area, give me a heads up and we can arrange a tour of the building. Or just e-mail me at arf7@cornell.edu.

Want to Work At the HPC?

By Tony Fracasso
My Summer as a Sooner

By Sarah Lynagh

This summer, I had the extreme privilege of interning at the Storm Prediction Center in Norman, Oklahoma. This amazing opportunity came about because of the Hollings Scholarship Program, which I applied and was accepted into as a sophomore. This program, which is sponsored and run by the National Oceanic and Atmospheric Administration (NOAA), provides undergraduate juniors and seniors with academic assistance as well as a 10-week, paid internship during the summer between junior and senior year. My involvement in the program began two summers ago, when I attended a week-long orientation in Silver Spring, Maryland, at the NOAA Headquarters. During orientation, I met the other hundred or so scholars, learned more than I could ever want to know about each of the six divisions of NOAA, and spent some time in DC. After orientation, things quieted down until October, when the database of potential internships was opened to our scholar class. Once this occurred, we could start contacting potential mentors who had posted project descriptions in the database from which scholars could choose. Since some of the positions were more desirable than others, some mentors requested resumes and a brief description of why you wanted the internship. However, each scholar is guaranteed an internship, so the stress level associated with this process was not very high.

Through a series of emails and an accidental project post on the internship database, I ended up getting in contact with the Public Affairs Specialist for NOAA at the National Weather Center, which is located in Norman on the University of Oklahoma’s campus (Go Sooners!). She was an amazing connection, and found two mentors from the Storm Prediction Center who were interested in working with me and were also interested in the societal impacts of weather, particularly tornadoes. I was absolutely thrilled that my dream of studying weather in Oklahoma was coming true. From this...
only job was to wait for the summer and get ready to hit Okie country!

In late May, I headed off to Oklahoma! The first few days were mostly just about getting oriented to the National Weather Center, which is an unbelievable facility (not to slight our lovely eleventh floor of Bradfield, of course!). I began to get to know the building, my mentors, and my project. The project, in a nutshell, consisted of looking for significant relationships between population variables and tornado fatalities across the US. After learning more about what my project would entail, I got down to reading. I read papers pertaining to my topic for about a week to two weeks, while my mentors continued fleshing out my project and gathering data for me. From this point on, I did a great deal of data analysis and a GREAT deal of statistics in search for significant correlations between population and population thresholds within various tornado watch areas and the resulting tornado fatalities that occurred in those areas. This task had its share of setbacks and frustrations, but in the end, I learned how to use a statistical software called S-Plus, I learned a great deal about the forecast products that the SPC offers to the public, and I came across some exciting findings! But more important than the research I did was the total experience of my summer in Norman. I had the amazing opportunity to shadow one of my mentors on a shift in the SPC, during which I witnessed brilliant forecasters doing their job in the midst of severe weather occurring across the country. I also had the chance to meet professionals around the building who worked at the National Severe Storms Laboratory, the Weather Forecast Office of Norman, and the OU School of Meteorology. I bought my first legit cowboy hat, and I experienced my first storm chase, which turned out to be a bust, but was still incredibly exciting. I also made some really great friends from all over the country, who I will likely keep in touch with throughout my career and throughout my life. My experience this past summer has also really helped me focus my interests and make some big decisions about next steps for me.

I cannot fully explain how meaningful this opportunity was for me and I really hope that current sophomores will take a chance and apply to the Hollings Program. Trust me…you have nothing to lose and everything to gain. If you have any questions about my internship, or about Oklahoma, or about the Hollings Scholarship Program, please don’t hesitate to ask me!

For more information on the Hollings Scholarship Program, visit:

http://www.oesd.noaa.gov/Hollings_info.html
This past summer I was given the amazing opportunity to have an internship with the U.S. Department of Energy at Brookhaven National Laboratory (BNL) located in Upton, New York. My internship was with the Atmospheric Sciences Division of BNL but more specifically, my internship was focused on analyzing wind profiler data from the Mid-Latitude Continental Convective Cloud Experiment (MC3E) that took place in Oklahoma from April – June 2011. The goal of MC3E, a joint campaign between the U.S. Department of Energy and NASA, was to obtain datasets on convective events in order to analyze the data in hopes of improving global climate models. Since my internship began at the end of the MC3E campaign, there was a large amount of data processing that needed to be done in order to begin analyzing the data.

The first half of my internship was composed of running IDL coded programs that read the data from the wind profilers. The data gave us information on vertical velocity, vertically measured reflectivity, spectral width, and hydrometeor classification. For those unfamiliar with the terms spectral width hydrometeor classification (as was I when I began my internship), spectral width shows the various velocities associated with a convective event while hydrometeor classification is a classification scheme that distinguishes convective events from stratiform events. Since there were approximately 15 events that the MC3E campaign flagged as significant, it took about 5 weeks to create and run all of the programs.

The second half of my internship was devoted to analyzing the data and creating my abstract and poster that was sent to the U.S. Department of Energy headquarters. All interns were required to submit a poster and an abstract as part of the internship appointment. The last week of the internship was composed of poster sessions, research presentations, and a graduate school fairs hosted by BNL.

Overall, my experience at BNL was extremely positive and I recommend that all undergraduates take advantage of the opportunity and apply to an internship with the U.S. Department of Energy. It was a great opportunity to catch a glimpse of the research oriented lifestyle of graduate school and I encourage students contemplating graduate school to apply for such research-based internships.

Atmospheric science has a credibility problem. By that I’m not referring to the IPCC, which reported that most of the Himalayan glaciers would have melted by 2035, although that was an inexcusable mistake. Nor am I thinking of the few, probably generously compensated ‘scientists’ who vociferously dispute the climate findings of the vast majority. No, the problem is at not in the top echelons of the field, but rather at the level of the average TV-station meteorologist. It’s embarrassing for people who are serious about studying the weather. It’s detrimental to the value that citizens assign to warnings. And it’s pervasive.

Visit any major public weather site and you’ll see what I mean. At the time of this writing, there are three headlines on AccuWeather that include the word ‘wild,’ and on Weather.com the story that gets top billing is the banal “NFL’s Worst Weather Cities.” Sharing space on the AccuWeather page is a story that actually deserves dramatization, an account of record flooding around Bangkok. Everyone knows that records merit attention; but rather than wait for a genuine record-setting event to transpire, commercial enterprises tend to manufacture, or at least overemphasize, records. This is natural for them, because news of exciting weather draws traffic to the site, but a stream of hyperbolic stories tires and jades people. Further, it creates in the public mind two conceptions that appear diametrically opposed but are actually, upon closer examination, the same: one, that the weather is always interesting, and two, that it is never interesting. Small wonder, then, when few people heed warnings. The alarm or excitement or whatever it is that weather outlets exude far surpasses the necessary margin of error.

And when exciting weather actually does happen (in an indication of the extent to which the amount of overstatement varies to fit the audience, the Bangkok article soberly reports the situation and avoids the déchets of the thesaurus), it is exaggerated, and each storm is necessarily more attention-worthy than the last. Hence the unfortunate birth of ‘Snowmageddon’, ‘Snowpocalypse’, ‘Snowicane’, and their ilk — although the last, perhaps as a sign of the controversy surrounding it, was trademarked. This is to say nothing of headline writers habitually proclaiming “Wild Weather is on the Way”, a headline on AccuWeather at this moment, or using words like ‘brutal’ when ‘unusual’ would do. One writer reflected, “Remember when we just had snow?”

With the same nonchalance, forecasters do not hesitate to drum up the anticipation based on the merest shred of speculation. Despite the present radar image, which shows scattered showers across the country, the headline screams “Winter Forecast Breakdown: How Hard Will YOU Get Hit?”, with a photo of a past storm accompanying. AccuWeather has taken a tentative and surely inaccurate guess

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and, in true Hollywood style, played it for all it’s worth. ‘Playing it’ means using their most dramatic material as filler when their proclamation of a standard-issue cold front as ‘wild’ is judged histrionically insufficient. This sensationalization may create interest in the weather, but diminishes the study of it as a true science. When people’s daily experience is not deserving of exclamation points, they’ll tend to disregard everything the forecasters say, even — especially— when their lives or property could be at stake.

While all of us get excited about a good storm, the melodramatics lead to a perception of the science as simple, and of forecasters as alternately juvenile or irrational. It’s time to reverse the inflation of extreme language and speak plainly. There’s a great need to educate the public on the weather, but ever-shriller voices will not achieve that goal. Fortunately, there are only so many words in a thesaurus.

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**Big Modeling Near the Big House**

*By Greg Tierney*

Just as Michigan plays in the Big House, I spent my summer in Ann Arbor running the “Big Model” as part of an REU summer program. Sponsored by the University of Michigan’s Atmospheric, Oceanic, and Space Sciences department, the program covered both space science opportunities as well as atmospheric science opportunities, bringing together different fields under one roof. For my individual project, I worked with Dr. Derek Posselt and another student on a case study of winter storm structure. Our analysis of the case consisted of two separate viewpoints on the storm.

First, we compiled detailed observations and analysis of the storm to familiarize ourselves with the
Using NASA’s A-Train suite of satellites, both traditional analyses and cross-sections of the storm were obtained. Plotting these up in IDL and NCL, we were able to get a good grasp of the 3-D storm structure. After observations and analysis came modeling the storm using the WRF model, which presented some unique challenges. Running a coarse resolution model first, we were able to successfully model the storm, comparing the output to actual analysis. Afterward, we decided to run a fine scale model, with 4km grid spacing across from Mississippi east to the Azores, and from Panama north to the Hudson Bay in Canada. All told, the model grid contained over 90 million grid points! We are still currently sorting out the model output, as we hope to discern the effect of latent heat in storm evolution by running the model twice: once as a “full physics” run, and one without the effects of latent heat.

Spending the summer in Ann Arbor was quite exciting, as Ann Arbor had the superfecta of a severe thunderstorm watch and warning, but both in the first week I was there! While there, the department introduced us to various faculty, not only on the atmospheric science side of things, but also space and planetary science, along with introducing us to their graduate program, which I am considering largely because of the REU program. All together, it was a great experience, and one that I would highly encourage fellow students to apply for. It helps to take the knowledge of the classroom, and apply it in a real-world research setting. Better yet, it works in the opposite way as well, and can help to inform work in the classroom!
A Summer At Barclays Capital

By David Chan

I interned at Barclays Capital, the leading British investment bank. I was in the Global Capital Markets division, and rotated through three three-week rotations; my rotations were with Canadian & Latin American Derivatives Trading, Equity Financing Sales-Trading, and Credit Financing Trading. The workplace is very competitive and the hours are long, but you get to work next to intelligent people from highly-diverse backgrounds that end up teaching you a lot about the markets and life. An internship in New York City also means your body will adjust to record levels of sleep (or rather, lack-there-of). There were dozens of networking events among the other Global Capital Markets interns, which gives you the chance to build relationships with peers from both Cornell and other highly-respected universities.

Saying you have worked or will work on 'Wall Street' seems to attract a plethora of connotations, but regardless of where one stands politically, it is an excellent place to start your career and build a valuable skill-set. I am proud to say I will be returning to Barclays and I believe this is an extremely challenging yet rewarding time to begin a career in financial services. Though the ties to meteorology may not appear to be strong, there are several roles in the industry which deal very closely to meteorological phenomena and seasonal forecasting.

If you have any questions on applying to Barclays or any other firm, please reach out to me at dac299@cornell.edu.

Interning at the WMO

By Joseph Lee

I spent my last summer at the World Meteorological Organization, in Geneva, Switzerland. I applied for an internship there for multiple reasons, mainly because there were nearly no internship opportunities for international students in the US. WMO was my only choice, and my last choice. Overall, I gained experience from a very different perspective in meteorology at WMO.

WMO is an international organization which organizes all the weather-related work over the world, such as constructing global weather databases and communication systems, standardizing weather instrumentations by publishing manuals and guides, and integrating the specialists around the world to work out ways to encounter climate change. Therefore, in the whole building of WMO, nobody forecasts!

There is no computer lab or weather instruments inside, but just piles of and stacks of folders. Everybody’s computer screen is showing: Gmail.
I worked in Observations and Instrumentations Department at WMO, and my advisor was a French marine meteorologist. I was told to draft a proposal to integrate the upper air marine observations into the existing upper air coding system of WMO. Therefore, I needed to read manuals and guidelines of marine instrumentations, contact specialists inside and outside WMO in order to familiarize myself with the specific knowledge. The documents I read were very technical, so I had a hard time understanding the details. For example, there are several ways to measure sea level temperature on a ship: lower a water bucket down to the sea and drag it up with sea water, place a thermometer near the propeller, or even by optical remote sensors. Among these methods, there is a lot of information about fine details: Where should the bucket be placed when it is idle? What would be the sources of error for each method?

In general, I was exposed to a “backstage” of operational meteorology at WMO. Since every colleague I worked with was specialized in coordination but not forecasting or researching, it gave me a different understanding of how daily meteorology is done, and who contributes to daily forecasts other than the weather guy up on the TV screen, and so forth. WMO granted me a very unique taste of meteorology that is far different from a normal forecasting or research-based internship.