THE Ithacation

The Cornell Chapter of the American Meteorological Society Newsletter

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A Farewell form the Co-Presidents

Greetings and salutations:

Seems only yesterday we were little tykes scurrying frantically around the 11th floor hallway. Stew went to CCAMS meetings but never talked to anyone and Jen really couldn't be bothered to go in the first place. My how times have changed. We would like to take this opportunity to get in a few last words before we head our separate ways.

We were going to include a short recap of this year's events, but there's free ice cream on the Ag quad and it only lasts for another half an hour. So just ask us if you want to hear a good story about the club.

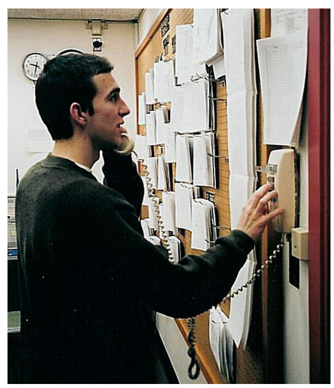
That being said there are thank yous in order for people who have been instrumental in the club's success this year. First, on behalf of the club we can't express enough thanks to Katherine "Flo Nunningale" Nunn. The amount of work she pours into the club's daily activities is worthy of several academic credits (unfortunately we're not qualified to dish those out). So thank you, Katherine, for leading weekend forecasts, publishing this fine publication, lending us your uncanny tornado knowledge, and being so willing to help.

All of this year's officers and committee chairs have done a wonderful job. Having such responsible people to share the workload made our lives much easier (i.e. gave us more time to rot). The big shout out goes to officers Ashley and Phil, chairpersons Tom, Kristen, and Amanda, and Nick for building the tanfastic CCAMS website. And thank you to all the club members who helped out with weatherphone, menial tasks, and club events and organization – you know who you are.

Last, but not least, thanks to Mark's Wysocki, and also Mark Wysocki. Without these two our club couldn't function and happy hours wouldn't be happy at all. Seriously, Wysocki is an incredible resource for this club and the entire department and the best darn advisor a club could ask for. Just don't ask him for advice about helium suppliers.

So it's been real, it's been fun, math classes weren't real fun but the rest was decent. Actually, it was a great time and someone will probably have to drag us out of here kicking and screaming. Best of luck to next year's officers and all the students and professors we leave behind. Hey guys! Whoa, Big Gulps huh? Alright….welp, see ya later!

Signing off,



Jen and Stew

The TORRO Scale: A Fujita Alternative?

Since its creation in 1971, the Fujita scale of tornado intensity has received much praise and criticism for its methods by which tornadoes may be ranked and therefore distinguished from one another. Those who praise it hold it as an indespensable tornado risk assessment tool, but those who criticize it claim that it is too subjective, and that ranking tornado strength on building destruction alone does not do justice to the true risk presented by tornadoes whether they do damage or not. Several alternative tornaod scales have been proposed over the years, and one of the first in the wake of the Fujita scale's implementation was the TORRO scale.

TORRO, or the Tornado and Storm Research Organisation, is a Brisith severe weather research group founded by Dr. Terence Meaden. Meaden also developed, in 1972, his own tornado intensity scale, which differs from the Fujita scale in that it has the added capabilities of rating tornadoes based on remote wind speed observations, such as with Doppler radar or photogrammetry. This allows for potentially strong tornadoes that never get the opportunity to produce damage to have higher intensities assigned to them than in the Fujita scale convention, where even tornadoes with estimated winds in the violent range would be rated at F0 were no damage done. The TORRO scale is perported to be more precisethan the Fujita scale, having 11 steps as opposed to 6:

TORRO Intensity	Description Of Tornado & Windspeeds	Description Of Damage (for guidance only)
T0	Light Tornado 17 - 24 m s-1 (39 - 54 mi h-1)	Loose light litter raised from ground-level in spirals. Tents, marquees seriously disturbed; most exposed tiles, slates on roofs dislodged. Twigs snapped; trail visible through crops.
T1	Mild Tornado 25 - 32 m s-1 (55 - 72 mi h-1)	Deckchairs, small plants, heavy litter becomes airborne; minor damage to sheds. More serious dislodging of tiles, slates, chimney pots. Wooden fences flattened. Slight damage to hedges and trees.
T2	Moderate Tornado 33 - 41 m s-1 (73 - 92 mi h-1)	Heavy mobile homes displaced, light caravans blown over, garden sheds destroyed, garage roofs torn away, much damage to tiled roofs and chimney stacks. General damage to trees, some big branches twisted or snapped off, small trees uprooted.
T3	Strong Tornado 42 - 51 m s-1 (93 - 114 mi h-1)	Mobile homes overturned / badly damaged; light caravans destroyed; garages and weak outbuildings destroyed; house roof timbers considerably exposed. Some of the bigger trees snapped or uprooted.

T4	Severe Tornado 52 - 61 m s-1 (115 - 136 mi h-1)	Motor cars levitated. Mobile homes airborne / destroyed; sheds airborne for considerable distances; entire roofs removed from some houses; roof timbers of stronger brick or stone houses completely exposed; gable ends torn away. Numerous trees uprooted or snapped.
T5	Intense Tornado 62 - 72 m s-1 (137 - 160 mi h-1)	Heavy motor vehicles levitated; more serious building damage that for T4, yet house walls usually remaining; the oldest, weakest buildings may collapse completely.
T6	Moderately-Devastating Tornado 73 - 83 m s-1 (161 - 186 mi h-1)	Strongly-built houses lose entire roofs and perhaps also a wall; more of the less-strong buildings collapse.
T7	Strongly-Devastating Tornado 84 - 95 m s-1 (187 - 212 mi h-1)	Wooden-frame houses wholly demolished; some walls of stone or brick houses beaten down or collapse; steel-framed warehouse-type constructions may buckle slightly. Locomotives thrown over. Noticeable de-barking of trees by flying debris.
T8	Severely-Devastating Tornado 96 - 107 m s-1 (213 - 240 mi h-1)	Motor cars hurled great distances. Wooden-framed houses and their contents dispersed over long distances; stone or brick houses irreparably damaged; steel-framed buildings buckled.
T9	Intensely-Devastating Tornado 108 - 120 m s-1 (241 - 269 mi h-1)	Many steel-framed buildings badly damaged; locomotives or trains hurled some distances. Complete debarking of any standing tree-trunks
T10	Super Tornado 121 - 134 m s-1 (270 - 299 mi h-1)	Entire frame houses and similar buildings lifted bodily from foundations and carried some distances. Steel-reinforced concrete buildings may be severely damaged.

While appearing to be quite useful, the TORRO scale has its faults as well. The damage descriptions given are stressed as being only for guidance, suggesting that they could not be used with consistency for rating tornadoes. Rating a tornado based on detailed engineering surveys (where associated wind speeds would be calculated for damage done) would be possible, but in practice, such surveys are rarely done. In addition, the TORRO scale was developed in a nation, Great Britain, where the vast majority of tornadoes are weak. Although it may be possible to test the methods for determining TORRO intensity in the U.K. Successfully with weak tornadoes, evaluating such methods as they relate to strong and violent tornadoes would require detailed studies of tornadoes elsewhere, such as in the U.S.

Consequently, the TORRO scale is not as in as wide use as the Fujita scale, but is growing in popularity in Europe. In such areas where tornadoes are rare to begin with, the TORRO scale may prove useful in assessing the risks from various intensities of tornadoes even if they do no damage at all.

NOAA Issues 2004 Atlantic Hurricane Season Outlook

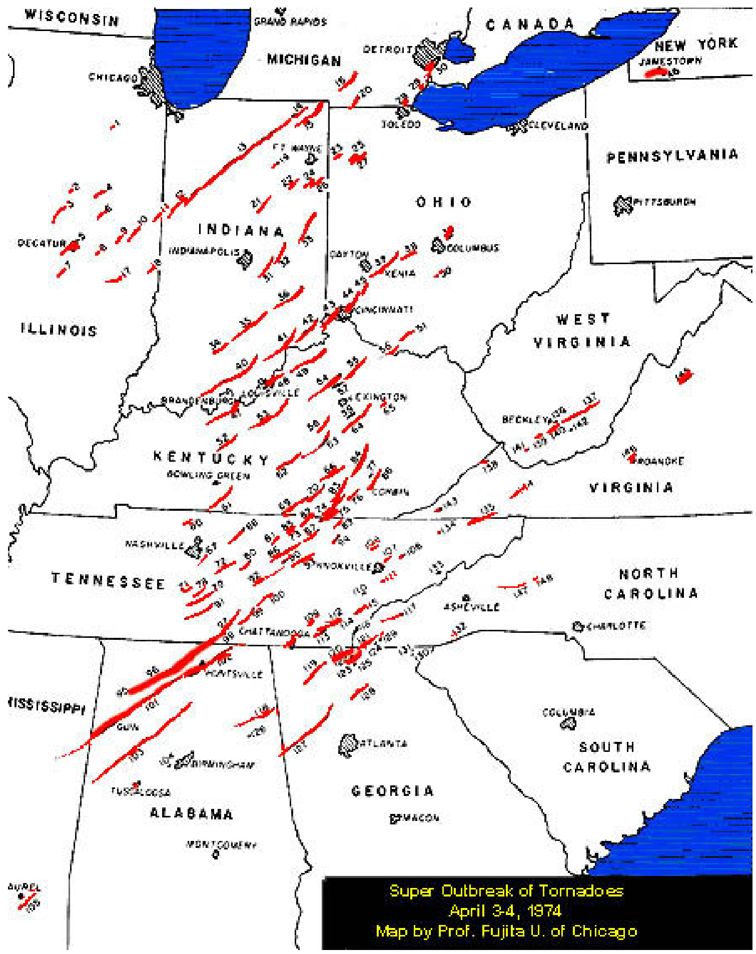
A joint panel of scientists from the Climate Prediction Center, the Hurricane Research Division, and the National Hurricane Center issued their outlook for the 2004 Atlantic hurricane season on 17 May. The otulook calls for an above average season in 2004, with 12 to 15 named storms. Of those, six to eight are expected to reach hurricane strength.

Traditionally, the ENSO phase has been a major signal in predicting hurricane activity in the Atlantic; this season, however, is expected to feature neutral ENSO conditions, or near-normal sea surface temperatures in the Eastern Equitorial Pacific. The forecasters cited above-average seas surface temepratures trends in the Atlantic as one of the factors behind the above-average tropical storm prediction.

Traditionally, the Atlantic hurricane season runs from 1 June to 30 November. Last year, however, the first tropical storm developed in April and the last dissipated in December. It is not out of the question that such surprises could be in store for us again this season. It is also important to note that the NOAA prediction is for all storms in the North Atlantic, not just those that make landfall. Only time will tell how many storms will vie to be the next Isabel or Juan this season.

Storm of the Month Special: The Super Outbreak

This April marks the 30th anniversary of one of the truly landmark weather events in the history of the U.S., and even the world. For 20 hours on 3 and 4 April 1974, a series of tornadoes that would later be called the "Super Outbreak" was spawned over an area from Canada nearly to the Gulf Coast, and remains to this day the largest single tornado outbreak in world history.



The outbreak occurred in a classic synoptic-scale scenario, ahead of a cold front trailing from a center of low pressure over the Upper Mississippi Valley. When the front encountered a mass of warm, humid air over the Midwest, an unprecedented series of severe storms ensued. 148 tornadoes touched down over the next day, the first hitting an open field in Illinois around midday on 3 April, and the last lifting into the clouds south of Lenoir, North Carolina on the morning of 4 April. When the outbreak was over, 315 lives had been lost in the U.S. and Canada, over 6,000 people had been injured, and tens of thousands were homeless.

13 states saw tornadoes during the Super Outbreak. Of the 148 tornadoes in the outbreak, 95 caused F2 or greater damaged, 30 were violent (F4-F5) and, amazingly, six of those were rated at F5 – a typical decade may not see that many F5 storms. 49 of the tornadoes were killers.

The hardest hit towns included Guin, Alabama; Brandenburg, Kentucky; and Xenia, Ohio, each of which were hit by F5 tornadoes and each of which had at least 20 deaths. The deadliest tornado of the day hit Xenia (see below for photo), taking 34 lives and damaging or destroying a third of the town's residences. In Alabama, a pair of tornadoes tore through the northwest portion of the state on parallel, violent, hundred-mile-long tracks. A few towns were hit by both tornadoes, and the damage swaths through forest areas were visible in satellite photos.

While the effects of the Super Outbreak were no doubt devastating, the death toll, though high, could have been much higher had tornado watches and warnings not been in place. The entire outbreak area was covered in watch boxes, and the long-track nature of several of the stronger tornadoes allowed many of those in the path of the storms to receive warnings in time to take necessary precautions. Considering that violent tornadoes prior to 1953 regularly caused 100 or more deaths apiece, the fact that the deadliest tornado of the Super Outbreak took only 34 lives is in part a tribute to the tremendous efforts of forecasters and local emergency management officials that day.

Records are meant to be broken, and we may one day see another storm of greater magnitude than the Super Outbreak. When it occurs, however, hopefully forecasting techniques will have advanced such that the death and injury tolls are much lower, and that those aspects of the Super Outbreak will remain history.

Some Final Thoughts From the Editor

In my four years on the 11th floor of Bradfield Hall, I've met folks from a multitude of ethnic and philosophical backgrounds. Whites, Blacks, Asians, Catholics, Protestants, Jews, agnostics, Irish, Italians (and Sicilians), Latinos, Bulgarians (well, at least partly so), Mets, Yankees, Bills, Lions, democrats, republicans, and moderates. In this age where pointing out and quarreling over differences seems to be all the rage, you'd think our collective differences would have led to a clash of some sort by now. I myself am Black, Irish, Cherokee and Jewish, so even parts of myself often disagree. And yet we are able to carry on in harmony because of what we all have in common: a deep and fervent passion for the weather.

Everyone is interested in weather on some level, but the vast majority of people are of the "everyone talks about the weather, but no one does anything about it" camp. We in the meteorological community do, in fact, do something about the weather: we give it the respect and consideration it so rightly deserves. Where others may find heartbreak, peril, or simply inconvenience in tornadoes, hurricanes, and snowstorms, we see beauty, splendor, intrigue and, most importantly, an opportunity to learn more about how these grandiose and rare acts of nature occur. Some seek to learn more by probing tornadoes with Doppler radars or flying planes into the eyes of hurricanes.

Others, like myself, take great pleasure in sharing their love of the weather with others, and writing has allowed me to do this. Each article you read here was written with the hope that at least one would fuel interests in various weather phenomena, or inspire new ones. But the *Ithacation* merely scratches the surface of the vast field of meteorology, and every one of us should continue to learn more about the weather, whether from stories on the evening news or perusing through research journals or taking weather observations with our very own weather stations. None of us should limit our weather education to college or graduate school.

Nor should we strictly perceive the weather on a quantitative basis. Those vexed by endless dynamical formulae should make every effort to ponder the variety in the clouds or the complexity of a single snowflake or the sheer wonder of a thunderstorm when we can, for it was in these simple acts of reflection that we first came to love the sky. In conclusion, at the risk of appearing overly sentimental, I would very much like to share a poem that I composed in such a period of reflection during my freshman year here at Cornell. It was written originally in French, and the English translation follows:

Un Chanson pour l'hiver

Les feuilles mortes sont tombées.
Le vent souffle à travers des arbres noues.
Il crie du mort qui approche,
Il regrette de la terre blessée.

La dame d'hiver arrive en nuage,
Sa voile blanche drapée sur la terre.
Elle berce le monde à dormir,
Elle remue le ciel à pleurer.

En laissant des pattes gelées elle danse
A temps de la rhythme des flocons de neige tombants.
Elle caresse gentiment son amoreux la fenêtre
Avec des baisers gelées de la dentelle blanche.

Prospérant dans le repos, angoissée de l'aurore,
Respirant d'haleine froid qui aventure le sang à brûler,
Si seulement pour ajourner la conception du printemps
Et la renaissance joyeuse de tous qui vivent.
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A Song for the Winter
The dead leaves have fallen,
The wind blows through the bare trees.
It cries of the coming death,
It mourns the wounded earth.

The lady of winter arrives in the clouds,
Her white veil draped across the land.
She lulls the world to sleep,
She moves the sky to weep.

Leaving frozen footprints she dances
In time with the rhythm of the falling snowflakes.
She gently caresses her lover the window
With icy kisses of white lace.
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Flourishing in silence, fearful of the dawn,
Breathing frigid breath that dares the blood to burn
If only to delay the conception of the spring
And the joyous rebirth of all that lives.

I wish only the best for all of you wherever your desires take you. Thank you so much for four truly wonderful years.

- Katherine Nunn ☺

☺ *Congratulations to Next Year's CCAMS Officers!* ☺

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Treasurer: Gretchen Goldman '06

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