NEWSLETTER
National Weather Association
No. 11 – 5 May 2011

Indices of Violent Tornado Environments

ARIEL E. COHEN
National Weather Service, Jackson, Mississippi

On April 24, 2010, a deadly, long-track tornado traveled from northeastern Louisiana across portions of central Mississippi, causing EF-4 damage with maximum estimated winds of 170 mph (76 m s^{-1}) in Yazoo City, Miss. and farther east into Holmes County. Ten deaths and over 100 injuries occurred from this tornado, one of many during a two-day severe weather event characterized by high values of low-level and deep-layer vertical wind shear and moderate instability. This combination resulted in extreme values of several mesoscale indices, including the significant tornado parameter (STP). In evaluating the tornadic potential prior to the event, forecasters noted these values and speculated on how intense any tornadoes might become. Although the potential for strong tornadoes was fairly certain, the potential for violent tornadoes was not as clear. This event provided the impetus to explore the potential for environments to support violent tornadoes.

This study identifies 46 violent tornadoes that occurred across the continental United States between 2003 and 2010. Several parameters describing the near-storm environment (NSE) within one hour of each violent tornado were collected by comparing the location of each violent tornado with Rapid Update Cycle-2 analysis output (40-km grid spacing) provided by the Storm Prediction Center. These data were used to characterize the NSE around each violent tornado. After the parameters were extracted, a scatter plot of each was generated showing the distribution of values.

High values of low-level shear and storm-relative helicity (SRH) were found to exist in these NSEs, with moderate amounts of surface-based and mixed-layer convective available potential energy (CAPE), though possibly less CAPE than that which characterizes the broader distribution of significant tornadoes. Figure 1 shows the distributions of SRH variables. The amount of SRH in the 0-1-km layer was found to comprise the majority of the SRH in the 0-3-km layer. In addition, large magnitudes of 0-8 km bulk shear and low lifted condensation level heights (not shown) characterize

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President's Message: Living Through the Violence

We are in the midst of a historic tornado season across the United States, and while we have seen the worst that Mother Nature can dole out, we have also seen some of the very best that operational meteorology has to offer. In spite of media reports that the "Twister hit without warning..." the truth about the Joplin, Mo., tornado on May 22 is that the warning for that particular storm had a 24-minute lead time. On April 27, one NWS forecaster in Alabama issued 19 tornado warnings, and nine tornado emergencies in a single shift. And, these are just the reports that have made it to my attention. Even more amazing stories are sure to exist, and it is sad that we don't get to hear more of them.

To be sure, the loss of life is mournful. Indeed, nearly as many people lost their lives in a 24-hour span in April due to tornadoes than from tornadoes in all of Dixie Alley in the 20 years between 1985 and 2006 (see the paper by John Gagan and his coauthors in the December 2010 issue of the Digest). It is certain that we will learn a

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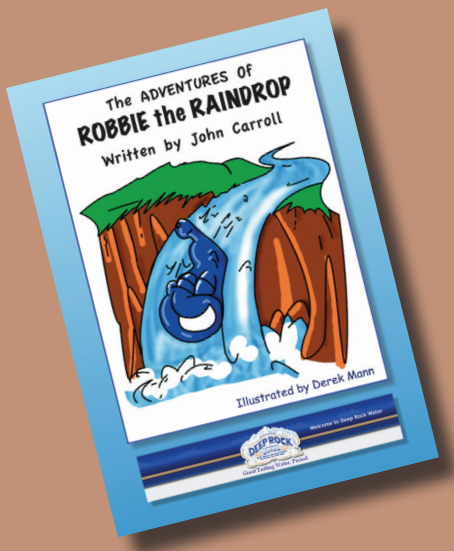
Inside This Edition



A coloring book creates a great "leave behind" for community visits. Hear from its creator, John Carroll, on page 4.

High Plains NWA Chapter Meeting

The High Plains Chapter of the NWA met for the second time in a row via a conference call on February 9, 2011 as adverse weather conditions prevented the scheduled physical meeting in Norton, Kan. Fourteen members from the Hastings (GID) and North Platte (LBF) Neb., and Goodland (GLD) and Dodge City (DDC) Kan. NWS offices participated in the meeting. The chapter continues to work toward achieving tax-exempt status, and has taken the first step to file as a non-profit organization. The discussion about the Jim Johnson Scholarship Fund ended with the selection committee deciding that the Scholarship winner would receive the money through their college. Al Pietrycha (GLD) continues to work with the Wichita AMS Chapter on the 15th Annual High Plains Conference (http://www.wichita-amsnwa.org/HPC), Aug. 4-6 in Wichita, Kan. A call for papers came out June 1. The registration is $90 or $60 for students. The banquet fee will be an optional $25.

New 2011 officers were accepted by quorum: President Chris Foltz (GLD), Vice-President Al Pietrycha (GLD), Secretary Tim Burke (DDC) and Treasurer Corey King (GID). The meeting participants voted to have the secretary email the minutes to the entire membership as soon as possible following the meeting and then again one week prior to the next meeting. This is so revisions can be made and the minutes accepted ahead of time to reduce the time spent on this issue at the meeting. This also gets more of the membership involved by reaching out to everyone through email. President Chris Foltz suggested setting "hard dates" for four physical meetings over the entire year on the second Wednesday of January, March and October with the fourth physical meeting at the annual conference. This will help improve long-term planning and to get as many attendees as possible to physical meetings.Other meetings would be conference calls or emails.

President Chris Foltz
Secretary Tim Burke

(Notes and minutes written by Mike Umscheid due to Tim's absence)

Three Rivers Chapter of the NWA Quarterly News

October to December 2010

The Three Rivers Chapter of the NWA at California University of Pennsylvania (Cal U) was awarded the Student Chapter of the Year at the 35th NWA Annual Meeting in Tucson, Ariz. Ten students from our chapter traveled to Tucson for the conference. Four students gave a presentation on a flash flood monitoring project they completed for their Geographical Information Systems class. The students worked on this project in collaboration with the NWS in Pittsburgh, Pa. Also, four students presented a noon-time weather briefing to conference participants.

Throughout the fall semester of 2010, our members prepared for our annual StormFest in February at the Carnegie Science Center in Pittsburgh. Students set up booths related to earth science topics with activities for younger students to enjoy. The first day was only open to elementary, middle and high school students. The second day was open to the public. Every year, this event gets bigger as we become more successful. It requires year-round preparation and students worked hard at planning activities, collecting items for those activities, and inviting local schools.

Our chapter hosts a number of colloquium speakers throughout each semester. During the 2010 fall semester, several speakers visited Cal U. Charlie Woodrum from the NWS in Pittsburgh was the first visitor. He was so impressed by our program and students that he attended all colloquia after his first visit and always brought co-workers along. This is a great opportunity for our students to meet and make contacts with possible future employers.

Other speakers included Dr. John Scala from WGAL in Lancaster, Pa., and Dr. Karen Kosiba from the VORTEX 2 experiment (http://www.nssl.noaa.gov/vortex2/). Dr. Scala gave a presentation on forensic meteorology and was able to show students a range of specialties in the field of meteorology. Dr. Kosiba gave a presentation on VORTEX 2, which students found to be very interesting. Speakers for the 2011 spring semester include Chris Weiss (University of Oklahoma), Steve Zubrick (NWS Baltimore/Washington), Mark Wenzler (National Parks Conservation Association) and Dr. Jenni Evans (Penn State University). During the course of the year, our chapter provides social events for students. These events are a great way for students and faculty to get to know each other. Our first annual event is an Earth Sciences picnic that includes all Earth Sciences departments. We usually host a cookout and play games at a local park. Another annual event is attending a Pittsburgh Pirates game early in the fall semester. Students car-pool to downtown Pittsburgh and enjoy a nice outing with other students and faculty members. Finally, at the end of each fall semester, our chapter hosts a winter social for students and faculty to get together and relax before finals. Students and faculty always look forward to these events.

Our chapter's Educational Outreach Committee has been scheduling visits to local elementary, middle and high schools in our area. Students from our chapter prepare presentations, play weather games, and give out information to other students about our meteorology program at Cal U. Students on the committee also visited schools over the winter break.

Many of the students in our chapter participate in the Peer Mentoring program at Cal U. An upper-class member becomes a mentor and is assigned a protégé, usually a freshman or a transfer student. This program gives protégés a chance to meet upperclassmen in their major. Many of the students form friendships and are able to help each other in many ways. Mentors often help their protégés buy books, schedule classes, and anything else they need help with.

The spring semester is off to a busy start. Keep up with our chapter at: http://sai.calu.edu/weather/web-content/.

Examining the Use of a Probabilistic Precipitation Algorithm for High-impact Thresholds

Ken Pomeroy, NWS Western Region Scientific Services Division

Currently, the National Weather Service (NWS) struggles to convey the threat of high-impact precipitation amounts in its gridded forecasts. When high precipitation amounts are observed, NWS forecasts are typically too low. In Western Region forecast offices in October 2010, the River Forecast Center precipitation analysis identified 109,000 grid boxes where at least one inch of precipitation fell in a 12-hour period. In 86% of those cases, NWS forecasts of precipitation amounts were too low. For cases where amounts of two inches or more were observed, 94% of forecasts were less than the observed amount.

This error is not easy to correct because forecasters in the western U.S. have a pronounced wet bias in general in their forecasts of precipitation amount. Increased training may allow forecasters to reduce their wet bias while also improving their ability to pinpoint extreme amounts. Nevertheless, it is unlikely that a deterministic precipitation forecast will ever predict extreme amounts accurately due to the spatial variability of precipitation, especially in convective cases. Therefore, a probabilistic approach to precipitation forecasting can have greater utility in both a scientific sense and as a way to convey the threat of high-impact precipitation amounts to the public.

The creation of probabilistic forecast grids at various thresholds would increase forecasters' workload. In addition, forecasters have no prior experience in producing such forecasts and may not have a sense of how to forecast an appropriate probability for varying thresholds. Fortunately, there is a solution that would produce reliable forecasts with no additional workload.

Recently, Amburn and Frederick (2006) suggested producing probabilistic precipitation forecasts based on previous research by Jorgensen et al. (1969; hereafter Jorgensen). The algorithm described by Jorgensen is simply a function of the probability of precipitation (PoP) and precipitation amount; quantities already produced by NWS forecasters. Research indicates that an unbiased probabilistic forecast can be produced for a user-selected threshold given an unbiased forecast of PoP and precipitation amount.

Using forecasts of a 100% PoP and a forecast amount of 0.50 inches for January through March of 2010 in the NWS Western Region, a statistical distribution as described by Jorgensen was calibrated based on the observed precipitation for those forecasts. This approach accurately simulated the distribution of observed precipitation amounts. When applying the calibrated distribution forward to similar forecasts during the April to September time period, it did well in predicting the appropriate frequency of extreme precipitation amounts.

For instance, this method would have predicted that 10.5% of all cases would have verified with at least 0.75 inches of precipitation. In reality, 9.6% of all forecasts verified with that amount. In both the predicted and observed cases, about 3.2% contained at least an inch of precipitation. A comparison of the predicted and observed distributions for this case is shown in Figure 1.

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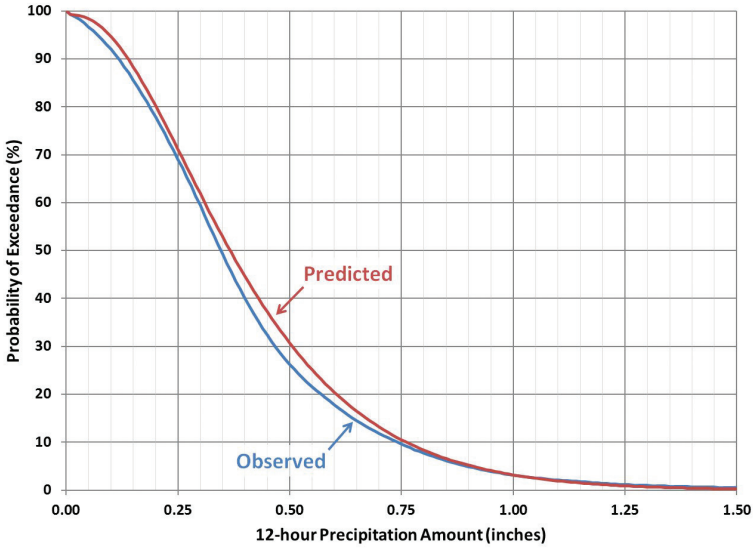
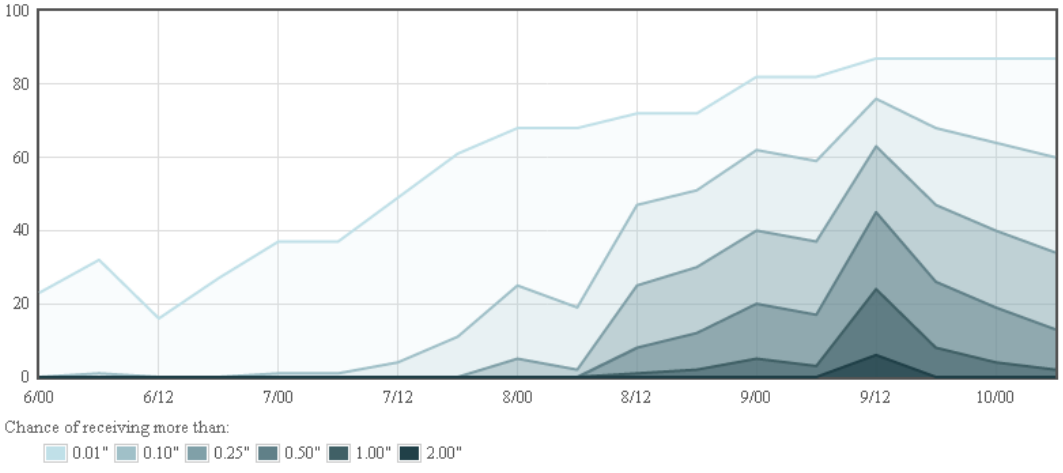


Figure 1. Probability of exceedance, observed and predicted, for forecasts of 100% PoP and 0.50 inches expected precipitation in the NWS Western Region, April-September 2010.

Probabilistic QPF for 47.81N 123.75W



roll mouse over graph for interactive feedback

Category	05 1800 MST	06 000 MST	06 600 MST	06 1200 MST	06 1800 MST	07 000 MST	07 600 MST	07 1200 MST	07 1800 MST	08 000 MST	08 600 MST	08 1200 MST	08 1800 MST	09 000 MST	09 600 MST	09 1200 MST	09 1800 MST	10 000 MST
0.01	23	32	16	27	37	37	49	61	68	68	72	72	82	82	87	87	87	87
0.10	0	1	0	0	1	1	4	11	25	19	47	51	62	59	76	68	64	60
0.25	0	0	0	0	0	0	0	0	5	2	25	30	40	37	63	47	40	34
0.50	0	0	0	0	0	0	0	0	0	0	8	12	20	17	45	26	19	13
1.00	0	0	0	0	0	0	0	0	0	0	1	2	5	3	24	8	4	2
2.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0

Figure 2. Prototype of a probabilistic precipitation forecast for various precipitation thresholds. This would be accessed from a point-and-click page similar to what is found on the home pages of NWS Forecast Offices.

36th NWA Annual Meeting
Oct. 15-20, 2011- Birmingham, Alabama
Get Ready! Get Set! And Register Now!

The End Game - From Research and Technology to Best Forecast and Response

THE ANNUAL MEETING OVERVIEW:

Saturday, Oct. 15: 9th Annual Golfing for Scholarships Outing
This NWA scholarship fundraising event will be in the Birmingham area. Watch the newsletter and website for details. Proceeds (over tournament costs) support the NWA scholarship program.

Sunday, Oct. 16: Broadcast Meteorology Workshop
This includes special presentations and other activities appropriate for the continuing education of weathercasters - it is open to all NWA members. Bring a DVD of a recent weathercast for discussion for the evening's DVD Swap. The 4th NWA Student Session provides guidance for students regarding how to best prepare themselves to enter the workplace. Includes a large student poster session and networking opportunities with broadcasters and other NWA members. Resume/DVD critique session included!

Monday-Thursday, Oct. 17 - 20: General Sessions
General Sessions will consist of both oral and poster sessions targeting the meeting theme, "The End Game – From Research and Technology to Best Forecast and Response." The annual Awards Luncheon will be held on Wednesday, Oct. 19.

Special Feature - Joint Meeting with 7th Annual GOES Users Conference: The GOES Users Meeting (GUC) will be in the Wynfrey Hotel Oct. 20-21 with joint NWA-GUC sessions and presentations scheduled for Thursday Oct. 20. NWA attendees are encouraged to attend the GUC sessions scheduled for Friday, Oct. 21. Visit http://directreadout.noaa.gov/GUC_VII for additional information.

Broadcast Meteorology: Much More than Forecasting the Weather

It is my opinion that as we grow in the broadcast meteorology world, we have to separate ourselves from other meteorologists in the market. For the most part, we all get the same information, the same models, the same radar, satellite and other data. Although we individually decipher the data, at a certain point we all come up with fundamentally the same forecast. The bottom line is that at the end of our allotted time each day we all end up with the same graphic: the 7-Day Planner. So what separates us from the other meteorologists in the market? What can we do to create that memorable moment? What can we do to keep the viewers we have and gain more?

You can appeal to the viewers with your personality, but unless you are significantlyunique, you may not separate yourself from the herd. Our graphics are uniquely ours, but once again they are all fairly similar. Titan, Viper and Doppler radars are all widespread throughout the country. Beyond that we need to draw attention to ourselves in a way that self-promotes and attracts new sets of eyes to our newscast and, more specifically,our weather presentations. What we need to do is get out in the community.

There are a number of ways we can present ourselves to the community: giving talks to schools and being the emcee at charity events are the most common. Go to the community services director at your station and let them know you are available to appear at events. Most of the time the events coordinator is struggling to find volunteers. Create a presentation that proves you are ready to talk to school students.

Since we are in a very competitive field,make sure you get a "proof of presentation" video. Take a video camera with you to the schools, shoot 20 seconds of the kids interacting with you and put it in your weather segment. You will get families, including grandparents, to watch your show and see their children waving to the camera. Put the video and pictures on your website as well, the more exposure the better. Also leave something behind, like a pamphlet about the weather with your station logo on it, something uniquely yours that will remind them of your visit. I created a coloring book that is popular with younger children (see page 1).

Once again, we all do the weather, but we need to separate ourselves from the pack. Community service is a good way to do this. A lot of our world is about self promotion and attracting new viewers. You can establish and maintain a long and successful career, generate job security and feel good about helping others by doing more than just the weather.

John Carroll, KREX-TV, Grand Junction, Colo.

Our profession is part science, part technology, and a lot of communication. This was requested as part of a series of professional development articles highlighting important work presented orally or via poster at the 35th NWA Annual Meeting. I hope it challenges you to continually find ways to enhance what many of youare already doing—providing outstanding operational weather support to your customers.

Kenneth CareyChair
NWA Professional Development Committee

Pre-register for the 36th NWA Annual Meeting by Sept. 30

The preregistration fee includes a preprint volume with program and abstracts. For the period of days registered, it also includes: admission to all oral presentations, poster sessions, and exhibit sessions plus coffee/refreshment breaks. Full registration includes the Wednesday Awards Luncheon. Registration after the preregistration period will result in higher fees. Non-members will be eligible for member rates if they join now!

2011 PREREGISTRATION FEES: (through September 30th)

Sunday, Oct. 16: Broadcast Workshop and Tape Swap
8 a.m. – 11 p.m.
$125 NWA members and presenters
$55 students and retired members
$175 for non-members
$105 for non-member students and retired

Sunday, Oct. 16: Student Seminar and Resume night session 1 p.m.-11 p.m.
$35 NWA student members and presenters
$55 for non-member students

Monday-Thursday, Oct. 17-20:
General Sessions/Activities
$295 NWA members and presenters
$130 students and retired members
$350 for non-members
$190 for non-member students and retired

Special One-Day Rates for period Oct. 17-20
$125 NWA members and presenters
$55 students and retired members
$180 for non-members
$90 for non-member students and retired

Special, All events Sunday-Thursday
$385 NWA members
$475 for non-members

Student Special, All events Sunday-Thursday
$150 NWA members
$225 for non-members

Program Committee, All events Sunday-Thursday
$95 Program Committee members

PREREGISTRATION ONLINE by credit card (AmEx, Discover, MC or Visa):

Attending Broadcast workshop and/or most of the General Session: www.nwa-registration.org/register.shtml

Attending Broadcast Workshop and only one or two days of the General Session: www.nwa-registration.org/registerbyday.shtml

PREREGISTRATION BY MAIL:

Complete this form and mail it with full payment of fees by Sept. 30, 2011 to: NWA Meeting, 228 West Millbrook Road, Raleigh NC 27609-4304 USA. Make payment to "NWA" in US funds by a US bank check, money order or government/institution purchase order.

Name (Preferred for nametag): _____

Employer, School or other Affiliation (for nametag): _____

City/State (for nametag): _____

Telephone number and e-mail address: _____

Arrival Date at meeting: _____ Departure Date from meeting: _____

Pre-registration fees (see above): _____

Number of extra Luncheon tickets ($40 each): _____

I am attending Oct. 17 Icebreaker - Monday evening (Free): _____

I am attending the 9th annual "Golfing for Scholarships" event, Sat., Oct 15th (Price TBA): _____

Total funds enclosed: _____

Circle all that apply:

NWA Member NWA Local Chapter Member NWA Broadcast Seal Holder Non-member Student Retired

Session Chair Presenter Program Committee Member Local Arrangements Committee Member

I will bring a DVD to the DVD Swap I'll attend the DVD Swap but not bring a DVD

I'm a student wishing to have broadcast DVD critiqued at Sunday Resume/DVD session

See VIOLENT from page 1

the environments of violent tornadoes, as they do in discriminating long-track from short-track tornadoes.

To aid forecasters in recognizing spatial patterns of STP distributions occurring in association with violent tornadoes, Figure 2 provides the approximate positions of six selected violent tornadoes overlaid on plan views of STP including mixed-layer convective inhibition (CIN) occurring within one hour of the tornadoes. Several other plan views were investigated and showed similar results: most of the significant tornadoes rarely occurred within the maximum STP contour and were usually found on the spatial gradient. This analysis is intended to provide preliminary guidance to characterize mesoscale environments supportive of violent tornadoes and provides general ranges of values observed for NSEs supporting violent tornadoes.

Future work stemming from this research could include developing a methodology for predicting violent tornado potential based on model output for the variables studied in this work. Such a methodology may provide forecasters with a level of confidence in assessing violent tornado potential. Additional work could also include evaluating the statistical significance of the differences between indices of violent and strong tornado environments, as well as characterizing large-scale patterns associated with violent tornadoes.

NOTE: A related paper on this topic is published in the Electronic Journal of Meteorology (http://www.nwas.org/ej/2010-EJ6/). The author completed this work at the NWS office in Jackson, Miss., but is currently assigned to the NOAA/NWS Storm Prediction Center in Norman, Okla.

Forecasters rely on indices to provide indications of threatening weather and, more importantly, the maximum warning and/or decision assistance to their varied customers. This article was requested as part of a series of professional development articles highlighting important work presented orally or via poster at the 35th NWA Annual Meeting. I hope this piece challenges you to continually findways to enhance what many of you are already doing—providing outstanding operational weather support to your customers.

Kenneth Carey, Chair, NWA Professional Development Committee

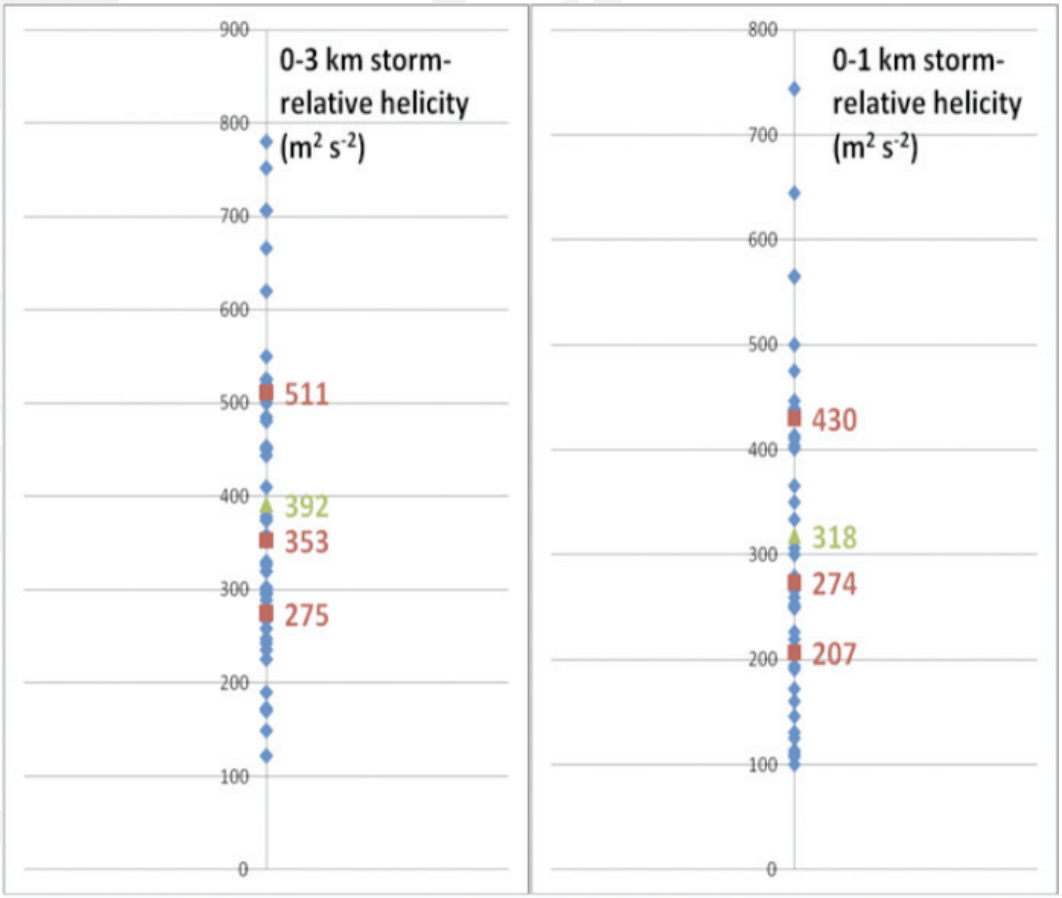


Figure 1. Distribution of 0-3 km SRH and 0-1 km SRH in the NSEs among violent tornado cases (blue diamonds), as well as the 25th percentile (lower red square), 50th percentile (middle red square), 75th percentile (upper red square), and mean (green triangle) value for each variable.

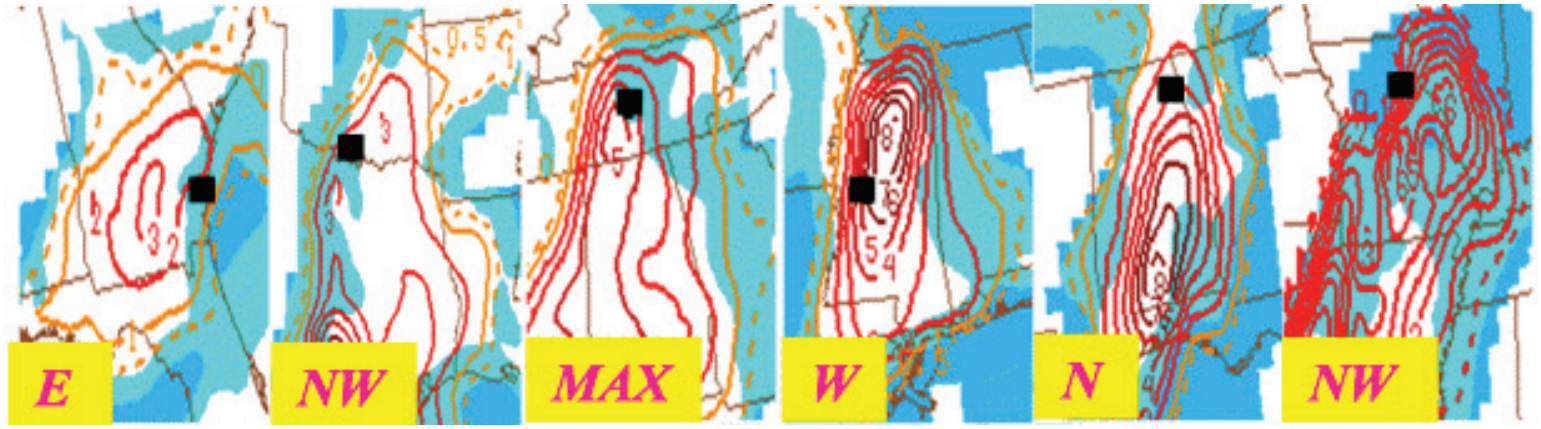


Figure 2. Regional distribution of violent tornadoes (black dots), STP (contours), and mixed-layer CIN (light blue fill indicates 25-100 J kg^{-1} and dark blue fill indicates over 100 J kg^{-1}). The annotations (red font in yellow box) specify the position of the point relative to the spatial gradient of STP.

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Analyses for other combinations of forecast PoP and precipitation amount indicate that this method has promise across the Western Region. However, the accuracy and reliability of probabilistic precipitation forecasts are only as good as the underlying forecast of PoP and precipitation amount. The predicted distribution used here accounts for the systematic wet bias in NWS forecasts of expected precipitation (and the dry bias in the PoP), which may not be viewed as a desirable feature.

Work is ongoing in the Western Region to produce a point precipitation forecast from a clickable map. Prototypes have been developed to display this information (Figure 2). The flexibility of this algorithm is that it can be applied to any precipitation threshold. Therefore, the ultimate plan is to allow users to define their own thresholds in such an application.

REFERENCES

Amburn, S. and J. Frederick, 2006: An Experiment in Probabilistic Quantitative Precipitation Forecasting. Abstracts 18th Conference on Probability and Statistics in the Atmospheric Sciences, Atlanta, GA, Amer. Meteor. Soc., 6.1. [Available online at http://ams.confex.com/ams/pdfpapers/100354.pdf.]

Jorgensen, D.L., W.H. Klein, and C.F. Roberts, 1969: Conditional Probabilities of Precipitation Amounts in the Conterminous United States. ESSA Tech. Memo WBTM TDL 18, U.S. Dept. of Commerce, Washington, D.C., 89 pp. [Available from National Technical Information Service, Springfield, VA, 22161, NTIS PB 183144.]

Leveraging the best science, technology and training are the keys to improving the delivery, timeliness and accuracy of forecasts for high impact events. This article highlights improvements that could be made to provide better probabilistic precipitation forecasts. This article has been requested as part of a series of professional development articles highlighting important work presented orally or via poster at the 35th NWA Annual Meeting. I hope this piece challenges you to continually find ways to enhance what many of you are already doing—providing outstanding operational weather support to your customers!

Kenneth Carey, Chair, NWA Professional Development Committee

NWA Sponsored Annual Meetings/Conferences

Aug. 4-6: 5th Annual High Plains Conference
Sponsored by both the Wichita and High Plains Chapters of the AMS/NWA, it will be in Wichita, Kan. www.wichita-amsnwa.org.

Oct. 15-20: 36th NWA Annual Meeting
See pages 4 and 5 or www.nwas.org.

Oct. 20-21: 7th GOES Users' Conference
It will be in Birmingham, Ala., with the first day as a joint meeting with the 36th Annual NWA Meeting. Details forthcoming.

Feb. 27 –March 1, 2012: 2nd National Flood Workshop
Organized by Weather Research Center (private, non-profit education and research center) in Houston, Texas, it will bring together agencies, emergency managers, academia and professionals nation to encourage dialogue on various aspects of flooding. Visit www.nationalfloodworkshop.net, call Weather Research Center at (713) 539-3076 or email wrc@wxresearch.org for more information.

Other Meetings & Conferences

June 14: The Forum on Earth Observations V
On Capitol Hill, Washington, D.C.: a discussion on the nation's growing demand for improved environmental information and strategies by which our civil, defense and commercial programs will meet the nation's priorities. www.forumoneo5.com.

June 18: 2nd Annual Raleigh StormFest
The N.C. Museum of Natural Sciences will host this event in Raleigh, N.C.

Oct. 3-5: Ice and Freezing Fog Workshop
Environment Canada will host a workshop on ice and freezing fog in St. John's, Newfoundland, Canada. http://collaboration.cmc.ec.gc.ca/.

Oct. 31 – Nov. 2: 15th Great Divide Weather Workshop
NWS Offices in Great Falls and Missoula will host this workshop themed "Sharing Innovative Science and Service." www.wrh.noaa.gov/wrh/greatdivide/welcome.php.

Jan 22-26, 2012: 92nd Annual AMS Meeting
In New Orleans, La. www.ametsoc.org.

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great deal about how people monitor the weather (or do not), how people did get the warning (or did not), how they took shelter (or did not), and a host of other societal issues that arise from such events.

With these issues as a background, I would like to pose a question once asked of me by Steve Weiss, the Science and Operations Officer at the Storm Prediction Center: "Why is it that those who practice meteorology are not celebrated in our science like academics and theoreticians?" I am told that in medical science, quite the opposite is true, and with good reason: practicing physicians are directly responsible for saving lives every day. Indeed, there are several famous practicing physicians whose names we know, e.g. Drs. Regina Benjamin, Mehmet Oz and Sanjay Gupta; can you name just one widely-known modern medical researcher?

You may ask why a teacher and researcher such as myself would spend any time thinking about this question, much less writing about it. The answer is complex, but I will attempt to sum it up presently. Eventually, public officials will give us a final number of how many lives were lost to tornadoes this spring season. What they will never be able to tell us is how many lives were saved by operational meteorologists and those who support them. I only know that, as an academic, I wasn't directly responsible for saving any of them.

Patrick Market
NWA President

2011 NWA ANNUAL AWARD NOMINATIONS DUE JULY 1ST
ONLINE NOMINATION AVAILABLE!!

Nominations are requested for the 2011 NWA Annual Awards. Awards will be presented during the Awards Banquet on October 19th during the 36th NWA Annual Meeting in Birmingham, Alabama. Meeting details are on page 4.

Go to http://www.nwas.org/awards/ for more details.

Dates 2 Remember

June 19-25
Lightning Safety Awareness Week

July 1
Deadline for NWA Annual Award Submissions

Aug 4-6
15th Annual High Plains Conference, Wichita, Kan.

Oct 16-20
36th National Weather Association Annual Meeting, Birmingham, Ala.

Oct 20-21
7th GOES Users' Conference, Birmingham, Ala.

Oct 31-Nov 2
15th Great Divide Weather Workshop, Bozeman, Mont.

NWA Newsletter (ISSN 0271-1044)
Technical Editor: Winnie Crawford
Editor and Publisher: Steve Harned, Executive Director

Published monthly by the National Weather Association, 228 West Millbrook Road, Raleigh, N.C. (USA) 27609-4304; phone ~ (919) 845-1546; fax ~ (919) 845-2956; exdir@nwas.org; www.nwas.org.

Submit newsletter items directly to the NWA office or to nwanewsletter@nwas.org. Material received by the 25th will be considered for the next month's issue.

Members receive the Newsletter and *National Weather Digest* as part of their regular, student or corporate membership privileges. Printed Newsletter subscriptions are available for $25 per year plus extra shipping costs outside U.S. Single copies are $3. **Address, phone number, email and affiliation changes can now be made online: member.nwas.org.**

Connecting operational meteorologists in pursuit of excellence in weather forecasting, communication, and service.

National Weather Association
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Raleigh, NC 27609-4304

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