



Meeting Minutes

American Meteorological Society Chicago Chapter April 1, 2008

Meeting held at the Lewis University Aviation Center. This meeting was a joint meeting with the Valparaiso Indiana chapter.

Meeting opened by Ed Fenelon, President, commenting on the strangeness of starting the meeting during Daylight. But winter was lingering as outside temp was 38 F.

Secretary William Johnson reported that work was still being completed on the Chapter Directory. Also, in preparation for the April 5 Severe Weather Seminar at Fermilab, Johnson had obtained a supply of literature from the national AMS office in Boston. This and some additional materials regarding the Chicago chapter and its website would be used as promotional tools during the breaks.

Fenelon reiterated to the attendees the value of this annual event and strongly encouraged attendance.

Treasurer Ray Waldman gave the Treasurer's report :

Current funds of \$1,429, with 59.44 in expenses during the month.

Waldman also announced that the May meeting would be the chapter's annual Banquet, to be held on May 17 at an area restaurant. Featured speaker for the evening will be veteran Chicago Broadcast Meteorologist, Harry Volkman. Banquet details to be posted soon on the Chapter web site.

(ed. note: Winners of the chapter's "Winter Precipitation Prediction" contest are also due to be announced at the May banquet meeting, based upon entries received during the December meeting at Chesapeake Energy in Chicago.)

Fenelon then called for attendees to introduce themselves, especially important as many visitors from the Valparaiso chapter were in attendance.

Two presentations were given at the meeting:

Chapter Member and avid storm chaser Evan Ammeson presented his first hand experiences and video footage of the May 4, 2007 Greensburg Kansas tornado.

Dr. Craig Clark, Assistant Professor of Meteorology, Valparaiso University, presented "A 30 Year Climatology of Lake Effect Snowfall in Indiana and Southwest Michigan"

Ammeson began by explaining that he had just come from chasing storms in Colorado, and had specifically chosen the southern Kansas area for his efforts that day. He first spotted the storm to his west, and began filming, while northbound on route 183, crossing into Kiowa county from Comanche county.

He captured the development of the storm's anvil on video as sunset was approaching, and the backlighting of the scene was excellent.

The tornado did not develop until later, but he managed to get one photo of the twister with dim backlight. Later, CG strokes provided strong backlighting for no more than 1 to 2 video frames, but it was enough to capture the profile of the fully developed tornado from an estimated distance of 15 miles out (SE of the storm).

Ammeson estimates he came to within 4 miles of the storm at one point.

Ammeson then played several video clips, including about 5 minutes of one extraordinary piece that featured a resonating howling emanating from the tornado. By that time, it was fully dark and the only images of the funnel were individual CG and CC stroke-illuminated frames. Even with the limited capabilities of the PC sound system, the eeriness of the wailing tones of wind were striking. It was also noted that he was filming from the SE side of the storm, so there was no rain to create noise or block visibility.

Prof. Paul. Sirvatka of the College of DuPage also noted that there was no distinguishable thunder despite the many very strong lightning strokes, evidence that Ammeson was fairly distant from the storm, yet the backlit images of the funnel filled the majority of the video frames and the sound of the storm was distinct and unmistakable. More evidence of the huge scale and power of the storm.

In response to follow-up questioning, Ammeson indicated that he based his estimation of the location for highest probability of tornadic activity upon the strength and direction of the Jet Stream reports that morning, estimating that the jet would "break the cap" over Kansas, not Nebraska.

Dr. Clark began his presentation with review of how he actually started the research into the Lake Effect Snow (LES) events in northern Indiana in 2001-2002, as a side project (working on it when he should perhaps have been working on his doctoral research!)

Later, he did significant "back-building" research, gathering data from LES events as far back as the winter of 1976-77. Data was taken from NCDC, Indiana State Climatological office and public NWS storm total reporting. He later added data from the same reporting periods from SW Michigan LES events.

Subsequently, he utilized sounding parameters gathered from the Green Bay WI (GRN) soundings as his primary snowfall total predictors within the models he developed and analyzed. Parameters included:

- Instability (lake to 850 mb delta T)
- Fetch
- Inversion Height and Strength
- Wind Shear
- Upstream RH

The first task was to separate the population of valid LES events from all snowfall events based upon a set of criteria including: Min. 2" snowfall in IN or SW Michigan and significant variance from nearby "non LES reporting stations." An event was included in the study population only when the meteorological conditions surrounding the event were "favorable" for LES and the subject areas received significant snow while nearby areas received little to none. A total of 263 events were included. Reports from the following cities were used:

Indiana: South Bend, La Porte, Valparaiso, Wanatah, Goshen, Winemac & Fort Wayne
Michigan: Benton Harbor, Dowagiac, Niles, Eau Claire, South Haven & Holland

Through histograms, Dr. Clark showed that the great majority of LES events were light snowfall totals, with LES events of 10" or more being in the distinct minority. In other words, the majority of the events being studied were ones where the snowfall reports from the LES areas were not particularly astounding, making it more difficult to tie the results back solidly to factors recorded in the GRN soundings.

Dr. Clark presented a number of composite national and polar maps showing winds/pressures at SLP, 500z, 850 T and 850Z for heavy LES events, comparing them to similar composites for LES events of less than 3".

Also shown were event-specific sets of "Before and After" national surface analysis maps, to illustrate the movement of the LES producing systems, along with a composite regional snowfall total map for each. As would be expected, winds directly out of the north, right down the length of Lake Michigan, favored IN LES events, while winds more from the NW favored SW MI events.

But more importantly, the heaviest snowfalls in IN were associated with more intense but shorter events (a few hours) and a strong Fetch along a very narrow band while the heaviest MI snowfalls were associated with lower winds but much longer duration (as much as 2 days of near constant snow) with much wider and more dispersed Fetch.

Dr. Clark also got into the details of the regression analysis / plots of data points from the snowfall totals of the 263 cases against the corresponding GRN sounding variables. His conclusions were that regression does explain a meaningful amount of the variance between events, but did not do very well in predicting the heavier events, a result which would have been very desirable.

He also presented a quick summary of analysis done using linear discriminant analysis, but conveyed that this methodology also failed to prove itself as a strong forecasting tool for predicting heavy vs. light LES events.

Below are his conclusions regarding predictors for strong LES events in IN and SW MI, taken from his final slide:

- Most cases have modest snowfall, but heavy cases are not rare
- Big ΔT required for big LES, but many cases have large ΔT and small accumulations.
- Fetch is critical
- *Upstream* inversion z not important, but inversion strength is a limiting factor.
- Upstream RH and wind shear not large factors.
- Linearity is weak – complicating model development (i.e. parsimonious regression model explains ~35%)
- Classification also problematic:
 - LDA error is pretty large
 - Trees not any better
- Duration of events important in MI

To learn more about this research, contact Dr. Craig Clark at Craig.Clark@valpo.edu

The meeting concluded with closing remarks by Ed Fenelon, including a reminder that the next meeting would be the last for this season and that the first meeting in the fall would also be a joint session with the Valparaiso chapter, to be held in Valparaiso next October.

Minutes recorded by Chris Thomas