The Australian Storm Chaser
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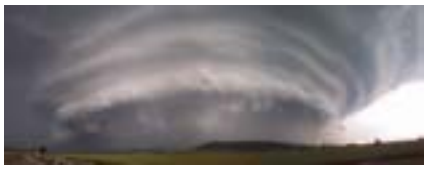
Major Supercell Outbreak 30 March 2003

Video clip by Jimmy Deguara of the giant hailstones thumping vehicle
[43seconds - 3.84mb WMV]

Although March is still officially a part of the severe storm season in New South Wales, the frequency of severe weather experienced is normally lower - particularly supercell outbreaks of this nature! From reports

filtering through, this outbreak and others this month have caused considerable damage in many less populated areas particularly along the coastline outside of Sydney. The most common damage has been to vehicles due to large hailstones. This particular event though produced some hail sizes into the giant category (diameters > 5cm) in some areas. By far the highlight of this month's storm structures was this HP supercell mothership captured further north later that afternoon by Michael Bath, Dave Ellem and Rodney Wallbridge.

(Photo by Dave Ellem)



Full report of HP beast available

The windshear profile of this outbreak was very impressive. With a southwest jet at 40-45knots at 500hpa and about 27knots at 700, storms were going to move generally northeast and north northeast if left movers. Combined with instability, sufficient heating, cold air aloft (temperatures down to -17C on the mid-north coast) and a good moisture profile, reasonably long lived supercells were likely. Hailstones of golf ball size and accumulated hail were likely as well as the usual strong winds. The cap was not the greatest and improved further north but the air was still sufficiently unstable to produce rapid development. On the lower mid-north coast, initiation was to occur earlier. The environment was sufficient in my opinion to even produce isolated tornadoes if conditions locally were ideal.

A wedding the previous evening did not dampen my enthusiasm for chasing this day. And after a quick final check of the usual models and variables, and knowing that others could not chase, I headed off solo to my target of the mid-north coast.

The trip up to Taree was definitely enlightening as massive v-shaped backsheared anvils of storms brought a smile to my face.

Storms were already developing on the ranges by late morning to the southwest of Taree and anvils were rapidly streaming northeast. It was encouraging to observe inflow winds from the east to northeast although not strong. Occasional staccato lightning bolts were observed as the storms intensified and approached. A couple of cumulus developed rapidly

along the northern anvil - similar behaviour to what I had observed in Tornado Alley last year. The updraughts exhibited twisting structure or corkscrew effects. These remained rain free for some time as they continued to grow and became more organised.

Suddenly, at 1:10pm, whilst moving to a different position, I noticed what looked like a significant funnel cloud. I zoomed in immediately with the video camera. It was in the correct quadrant where the wall cloud was to be expected. This storm was definitely severe with hailshafts developing around the forward flank and the core region. This was not a HP supercell. It looked classic based on overall structure. I remained at this vantage point a little while longer, and moved north once drops of rain developed.

The trip north revealed more of the impressive activity well off the coast, the side anvil of the complex I was under and also the development of impressive structure of the two cells developing along the anvil mentioned above.

I was more interested in positioning with this particular storm outside of the rain. But with the rain around, I kept moving north to find a better position. With the rain, mountains and trees, the view was hopeless and in the end, I never stopped to observe at all. It would have been good to observe if not briefly the structure that had produced the funnel. Only glimpses of this region seemed to confirm classic structure. Lightning in this region seemed to be more frequent though nothing out of the ordinary.

My mind was set on the impressive structure and contrast exhibited by the storms to the north. But yet again, trees and mountains made viewing difficult and since the road twisted and turned, it became difficult to hold bearing with respect to the main cell. The main views of the structure occurred around Kew and it was clear this was a right moving storm. Reasonably impressive though insufficient time to stop yet again.

I entered the core of the storms from the south side. Hail and mostly heavy rain made driving hazardous. Aquaplaning in some sections forced me to drive well below the normal speed. Passing the Port Macquarie turn off, sunshine could be seen so locating on the northern side was a good option. Then suddenly, "thump"!! These were larger stones from the sound though sporadic and isolated. It was inevitable. I was under the development area of the supercell core most likely the second cell that was moving left and in the same direction as I was. Radar shows this cell develop a main large core rapidly about this time.

It was impossible to predict where the next pelting would occur and each time, there were isolated large thumps. No place to take cover, I continued on hoping to get onto the northern side. Passed the Telegraph Point turnoff though, I knew my car was in for a pounding. What I was not expecting was the hail to grow from 4 to 5cm diameter maximum hailsize to a barage of hailstones in the range 6cm to 7cm!! The vehicle was pounded so hard I was concerned windows were going to smash. I could feel the vibrations of the largest hailstones. And these were hard stones too - unlike anything I had observed previously on my Australian chases. The odd hailstone would splatter on the windscreen though. What was in my favour was that wind was from the south and I was heading generally north - with and not against the falling hailstones. The wind was not very strong either. Otherwise the damage would have been disastrous.

About 15km south of Kempsey, the heavens opened!! The frequency of the pounding from giant hailstones meant it was time to take shelter. Next road left, and I was quickly huddled near trees. Footage of the hailstones reveal dominant hail being golf ball with larger thumps from hail I believe to be up to 7cm in diameter (though not measured - more analysis later). The hail bounced to about a metre or more after impacting the ground whilst large splatters also occurred.

The hammering was now so violent from these hard stones that I huddled next to another tree hoping to minimise damage. My car became covered with leaf letter. This all lasted a matter of a few minutes.

Heading north once again to remain with and ahead of the storm was a good decision. Measuring hailstone size was at a lower priority as the odd stones were still falling and I was afraid of injury. A few smaller golf ball sized hailstones had fallen in the car whilst filming. The main core had moved off to the east of the main highway. What it left in its wake was a carpet of immense leaf litter. This was the first time I had observed a carpet of leaves all over the road (the Pacific Highway) since the Sydney-

hailstorm April 1999.

Due to being in the storm, one tends to lose track of time. So it was a surprise when I noted I was entering Kempsey 80km/h zone. In fact I was delighted as I knew this was the start of the river plain with excellent views for chasing. It would allow me the opportunity to observe the structure of this likely supercell. Once out of the main township, I was treated to an impressive structured classic supercell complete with wall cloud and inflow into the leaning main tower as well as rear flank hail shafts. It is important to note that this was a left mover and definitely the stronger of the two storms. This structure seemed to maintain for at least half of the trip to South West Rocks. The storm seemed to be weakening once nearer the coast though changing structure. I generally lost contact with the main cell at South West Rocks. The cascade of hail precipitation certainly had hidden the mesocyclone from view.

I had also entered another region of hail from a line of cumulonimbus that slowed down my progress. I needed fuel so stopped at the service station. This was the first chance I had to inspect the "dented mess" - see below.

Was the chase over? No chance of

heading and catching the storms in areas north of Coffs Harbour which now had an overhsooting top (Anthony was on this storm I found out later). Well I would have headed home at this point being 3 to 4pm, but observed another strong storm to the west. I knew it had a chance of being more LP oriented. Generally though, despite being initially strong looking, I was not impressed by this storm. After moving to Scotts Head encountering another hail damage path of leaf litter and observing a storm to the north, I settled to taking some time-lapse of the base structure of this LP storm. The storm weakened significantly after this point.

The chase was not a very long chase overall as was to be expected on this day with fast moving storms but definitely provided some intense moments. The following is an assessment of the hailsize based on video stills and leaf size from deposited in the same storms. This is important in trying to determine an acceptable range of hailsize limit since it was not measured. The damage as observed below was significant - more so than observed in The Oaks hailstorm event December 2001. Side panels have dents despite the lack of severe winds. Roof damage was the most severe followed by the bonnet and then boot (consistent with the larger sheet metal area used). Please note the calipers have been opened in all pictures to 5cm spacing.

These pictures below are meant to illustrate the approximate view and distance of the hailstones.

From my assessment of comparing the latter two pictures, it seems the hailstones were at least greater than 5cm. From the type of damage, I do believe hailstones of at least 6cm are responsible for the larger dents. Comments from those with a great knowledge in assessing hailsize from car dents are greatly appreciated.

Click here for all stills listed online of this event.

If you (or someone you know) have any photographs or video of this event or any other type of severe storm such as damage, the storm structure itself or hail, please feel free to contact Jimmy Deguara. Your contributions are very welcome. Please any photographs or video footage are important so don't discount anything.

Editors Note

Welcome to the second issue of "The Australian Storm Chaser" a journal dedicated to providing the latest news from the world of Australian Storm Chasers. Februarys inaugural issue was a resounding success by all accounts and I hope you enjoy this issue just as much. This month we are packed to the brim with more fascinating articles, including a review of a storm chasing site based in Israel and a thrilling account of severe storms which hit the mid-north coast during late March.

Regards,

Matthew Piper
Editor of "The Australian Storm Chaser"

Members Profile

Name: Jimmy Deguara
Age: 35
Location: Schofields, NSW
Weather Interests: Hail and tornadoes.
Portrait:

What's Inside the September Issue?

Mammatus Photography 4th June 2003

by Matthew Piper

The above sequence of photos were taken at Blaxland on the 4th June 2003. They were all obtained using a Pentax Optio 330 Digital Camera. The photos were taken around 4:15pm just after a thunderstorm had moved off the ranges and was heading into the Sydney basin. This storm apparently produced small hail and torrential rain at Llandilo. It also prompted the issuing of a Severe Thunderstorm Advice by the Bureau of Meteorology.

My Weather Website Report

by Jeff Brislane

David Shohami's Israel Storm Chasing and Photography Homepage http://israelstorms.netfirms.com/index.html

I first discovered this website about 1 year ago when I was searching through the links page on an American chase site. I was amazed at the time that Israel had such a varied climate and ever since then I periodically come back to David's website to see what's happening in the Holy Land.

According to David, Israel is a land that's climate varies from desert to heavy snow. They have a Mediterranean climate with dry summers and a wet and cold winters with snowfalls as low as 650m asl. Plus in spring and autumn they get plenty of thunderstorms with quite a few severe ones and probably some supercells. October seems to be one of their stormiest months with a few severe storms reported last October, and one particular storm that produced 7.5cm hail!!!

David started chasing storms in 1997 and apart from a three year forced spell in the Israeli army, has been chasing ever since. He has a real passion for the weather in Israel and it shows in his dedication to his website.

The website has a very basic set-up with News updates, current weather forecasts, a list of any current outlooks and watches and a nice archive of events stretching back to 1997. He also has a nice photo gallery with some impressive photos of possible supercells and also some great snow photos.

David also has a good knowledge of the typical weather patterns that affect Israel and I have learned a lot about that part of the Middle East just from his comments. He appears to have a reasonably in depth knowledge of weather terminology, especially in regard to his local climate.

If I had to rate his website out of 10, I would give it an 8. If you had to have a basic website with good value for the size than this would be hard to beat.

Lower Central West Storm Chase March 15th 2003

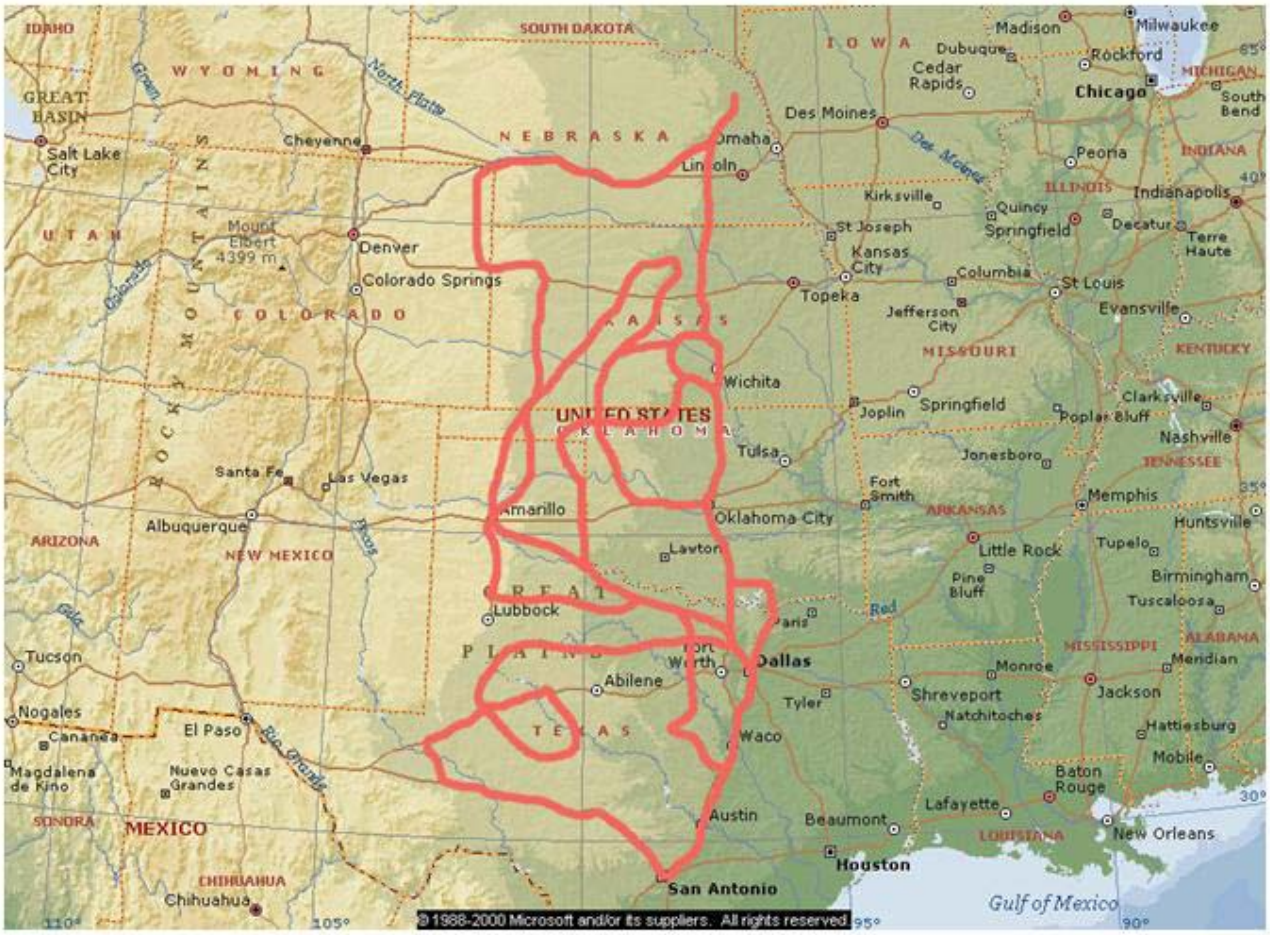
March 15th 2003
Report by Jeff Brislane

Today's chase was going to be a make up chase. Why? Because a couple of weeks earlier on the 3rd of March, Matthew Piper and myself had chased from Goulburn south to Bateman's Bay and in doing so we missed a severe storm on the Southern Highlands that we would have chased if we had stayed in our target area, which for the 3rd of March was Goulburn. That made today even more important, because no one wants to bust out chasing over one weekend, let alone over consecutive weekends.Today would be a day of contrasts as we chased, because although we caught up to and witnessed an awesome storm in the Oberon/Jenolan Caves area, we also missed an impressive severe storm that pounded Lake Bathurst south of Goulburn with massive flash flooding. So today for me became a day of mixed emotions which I'm starting to realise is quite common when you chase a system that produces multiple severe storms. On the one hand I am glad we witnessed the Oberon/Jenolan storm but on the other hand I wish I had seen the other as well! Our first port of call today was Marulan where we stopped for food and to take in the situation as weak storms were firing along the ranges North from Goulburn. At this stage in the day the trough that was present hadn't yet reached full potential. The sky over the ranges was cluttered with junk so we decided to head south to Goulburn where we would be closer to any new development. We watched the developing system at Goulburn and decided that heading north was probably going to put us in the best position. We chose the road to Oberon and drove north through a weak developing storm north of Goulburn and then on for about 20 km's till we found a small valley with good views in all directions. It was here that I got my camera out and started taking the first photos. From our position we could see a very strong looking storm to the North that we estimated would be in the vicinity of Oberon or Lithgow. Looking south at this point showed no indication of the development that lead to the severe storm that later hit Lake Bathurst. As the only really good development appeared to be further north we decided that that was where we would head. At about 15 km's south of Taralga we noticed that there were very strong looking towers going up just South of Goulburn. We stopped to reassess the situation and decide to keep heading north where the development was looking very strong and well organised. I stopped for a quick photo opportunity on the edge of Taralga before deciding that it was north or bust so on we went through Taralga toward Oberon. It wasn't until we got into view of the Abercrombie River Gorge that the base of the storm to the North of us came into view and what an awesome storm it turned out to be. We watched this storm from this location for around 45 minutes and in that time we witnessed a beautiful well-structured thunderstorm that produced a beautiful pointed shelf cloud and an excellent lightning display. The whole time we watched it from this location it appeared to be completely stationary. After a long time watching we decide

to head North in the outflow to see whether it was producing any hail. We stopped west of Porters Retreat on the Oberon road where I took photos of what was probably a hail shaft. I didn't know it until we drove North through it's path. We turned right onto Shooters Hill road and headed north to Shooters Hill. Along this road we saw what looked like hail fog on the edge of the state forest. About10 km's up the road we came over a hill and saw this right where that hail shaft had been. It wasn't huge, only 1 to 2 cm's but it was still nice to see for a change. From here we headed out to Jenolan Caves where by now the system was rapidly weakening and heading into the Sydney Basin. It was time to call it a day. On the trip back we stopped at the wind turbines at Hampton before heading home via Lithgow. All in all it was a nice satisfying chase and a welcome relief from the previous bust.

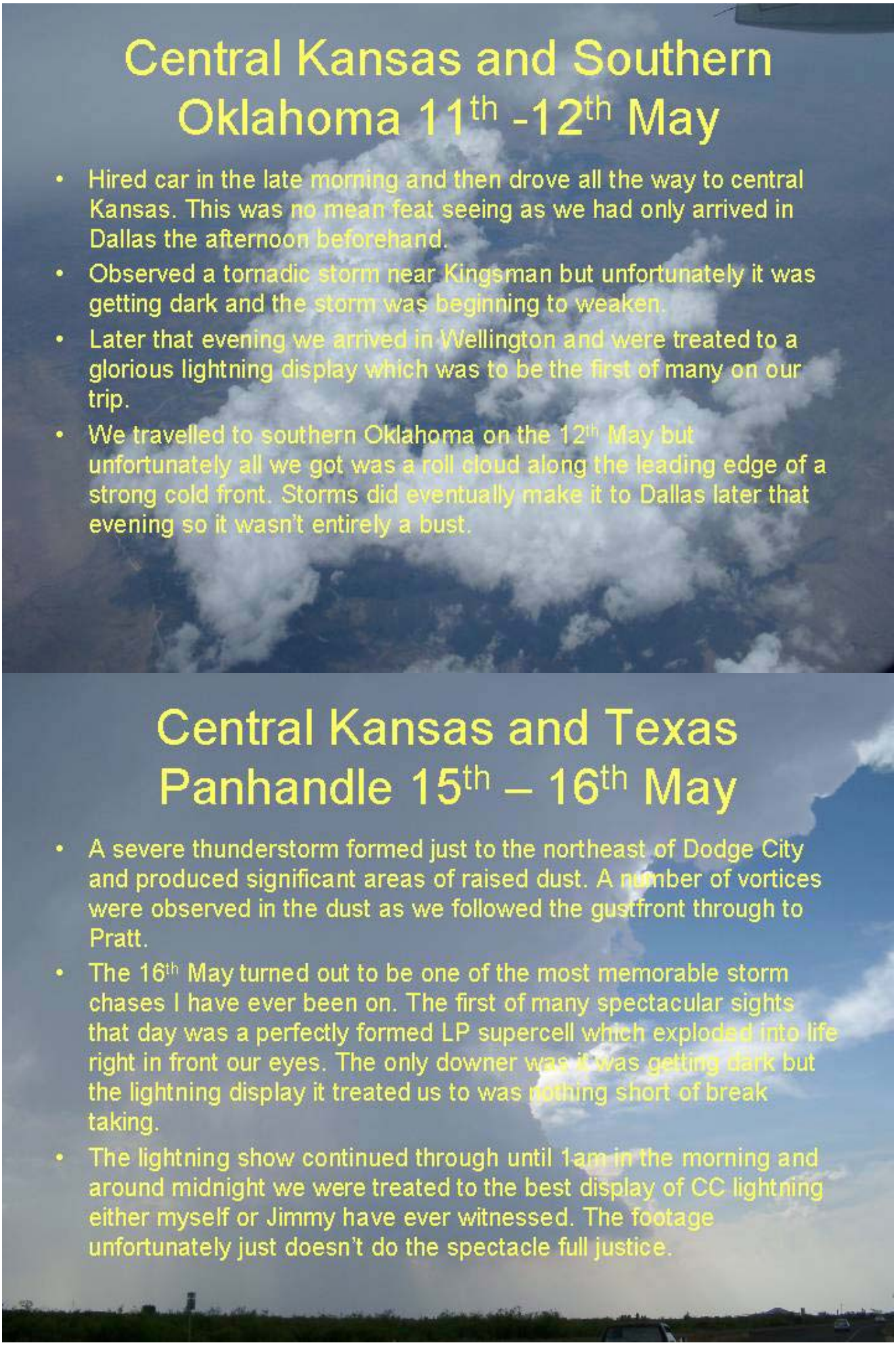
Storm Chase Dates

- Central Kansas - 11th May 2002
- Southern Oklahoma - 12th May 2002
- Central Kansas - 15th May 2002
- Texas Panhandle - 16th May 2002
- Northern Kansas - 22nd May 2002
- Texas Panhandle - 23rd May 2002
- Northern Texas - 24th May 2002
- Southern Texas - 25th May 2002
- Western Texas - 27th & 28th May 2002
- Southern Texas - 29th May 2002
- Nebraska - 2nd June 2002
- Eastern Colorado - 3rd June 2002
- Texas Panhandle & Northern Texas - 4th June 2002



Quick Facts

- Length of holiday – 4 weeks
- No. of chase days – 14
- Distance travelled by car – 8500 miles or 14,000 km
- No. of supercells intercepted – 11 including 5 LP's
- No. of tornado's seen – At least 2, maybe more
- No. of times hail was driven through – 5


Central Kansas and Southern Oklahoma 11th -12th May
• Hired car in the late morning and then drove all the way to central Kansas. This was no mean feat seeing as we had only arrived in Dallas the afternoon beforehand.
• Observed a tornadic storm near Kingsman but unfortunately it was getting dark and the storm was beginning to weaken.
• Later that evening we arrived in Wellington and were treated to a glorious lightning display which was to be the first of many on our trip.
• We travelled to southern Oklahoma on the 12th May but unfortunately all we got was a roll cloud along the leading edge of a strong cold front. Storms did eventually make it to Dallas later that evening so it wasn't entirely a bust.
Central Kansas and Texas Panhandle 15th – 16th May
• A severe thunderstorm formed just to the northeast of Dodge City and produced significant areas of raised dust. A number of vortices were observed in the dust as we followed the gustfront through to Pratt.
• The 16th May turned out to be one of the most memorable storm chases I have ever been on. The first of many spectacular sights that day was a perfectly formed LP supercell which exploded into life right in front our eyes. The only downer was it was getting dark but the lightning display it treated us to was nothing short of break taking.
• The lightning show continued through until 1am in the morning and around midnight we were treated to the best display of CC lightning either myself or Jimmy have ever witnessed. The footage unfortunately just doesn't do the spectacle full justice.

Northern Kansas to Southern Texas 22nd – 25th May

- We ended up heading out to the Texas Panhandle on the slim chance a storm may pop up. What we eventually got was severe clear but there was very strong (70 kph) southerly winds blowing which kicked up plenty of dust storms.
- On the 22nd we ended up scoring ourselves some severe storms near Hays in northern Kansas. A storm to the south of us looked very spectacular at sunset but it quickly dissipated.
- On the 23rd we travelled to the Texas Panhandle where we observed our first round of tornados and a severe hailstorm around midnight.
- The 24th of May saw our first opportunity to chase a moderate risk day. It ended up delivering us a beautiful multi-vortex tornado after some initial disappointment with the earlier storms.
- The 25th of May led to us chasing some severe multi-cell storms which was a change from the abundance of supercells we had been getting since arriving in the USA.

Western and Southern Texas 27th – 29th May

- We left Dallas on Memorial Day and decided to head for the area south of Lubbock. This chase yielded a number of severe storms, including a barrage of large hail around sunset.
- The 28th May delivered us two of the best LP supercells we have ever seen in the daylight. An encounter with a number of close lightning strikes also added to the days excitement.
- On the 29th May we journeyed across the south of Texas bound for the metropolis of San Antonio. Here we missed out on the best of the storms which unfortunately raced away towards the Gulf of Mexico.

Nebraska to Northern Texas
2nd – 4th June

- On the 2nd of June we decided to head to Nebraska after leaving Rocky Rascovichs home in Piedmont, Oklahoma. A number of chasers including Jim Leonard were excited about the prospect of storms there so we decided to head that way and see what would happen. As it turned out we had nothing but severe clear due to the strength of the cap.
- The 3rd of June was a lot kinder to us with a severe hailstorm heading right over the top of us in eastern Colorado.
- The 4th of June was even better with a severe hailstorm denting our hire car and blasting the town of Floydada for around 5 minutes. I couldn't of asked for a better birthday present.

My thoughts on chasing in the USA

- The road network is not substantially better than Australia contrary to popular opinion.
- The storms are on the whole better organised than Australia and the opportunities to observe severe weather are far greater.
- The number of chasers in the US has to be seen to be believed. Every time a storm popped up there would be heaps of chase vehicles on the road.
- The reaction of the general public to storm chasers is a lot different than in Australia. In the US people treat you like a super hero when they find out you chase storms. On one occasion we even had a young lass jokingly propose marriage to us as she was so excited.
- The availability of detailed met data on the net enabled us to find storm genesis regions more accurately than in Australia.
- Trees are a rarity on the US plains so you can see storms without obstruction.

What does a NSW storm chaser do in the winter when theres no storms around?

Go chasing snow on the Central Tablelands.

Oberon
July 26th 2003
(Digital Photos by Matthew Piper)

Australian Storm Chaser Meetings

Hi all,

To say that I, and others, were grateful for the efforts put into the ASC meeting this month is an understatement. The presentations were done professionally and all were informative. This was not just a meeting it was a show full of variety. I am sure that attendees were able to go away with some value added thoughts, let alone provoking discussion during the presentations. Thanks to those that made the effort to attend and a special welcome to the new faces. Great to see presenters making use of the extensive resources made available by Brett by creating Powerpoint presentations. We thank him for use of the venue as well. Thanks Brett for presenting member with the security key badge - now we can annoy you more!!! And this is all for free! Brett again put weather instrumentation on show.

All in all 9 presentations were planned but we were only able to get through 7. The others are ready for the next meeting. Looking forward to it Geoff and Mario.

In brief, those who presented:

Matt Piper presented an excellent insight on thickness lines as we see on the models every day. Some good rule of thumbs mentioned as well. Matt did well to comment on some of the limitations and cautions when dealing with thickness lines. He also commented on several recent case study charts and used satellite imagery to illustrate the important concepts.

David Croan then produced a valuable presentation on drylines and in particular The Dryline of the US Tornado Alley. Like Matt's presentation, it was pitched at an appropriate level to help understand the unique behaviour it exhibits as compared to other drylines recorded around the world including Australia. David's artistic values were as usual at a high standard. I was quite impressed with the 3-D graphical simulation of The Dryline.

John Sweatman presented yet another book review (after Mario presented his recently) this time on the Mediterranean and the Black Sea and their formations. I was impressed with his descriptions and the enthusiasm on the subject that certainly captured ASC members. I certainly would not have known about the history of this region otherwise. Let me tell you it is an interesting book to read.

Nick Moir certainly proved his 'award winning' values when he presented a collection of stunning images he had captured over the years. I must say my favourites were the Canberra bushfires but his collection covers all aspects of severe weather and the impacts on human subjects in his photography. Nick seemed to enjoy the meeting last night and has promised to come along in future. This would be of great benefit to the group.

Brett Vilnis kept the subject on bushfires warm by presenting the long awaited bushfire video. Well this was unique in that there was a wall cloud attached to a supercell thunderstorm. The video shows the bushfire smoke visually marking the direction of the northerly inflow and the imminent wall cloud. The next lot of footage then shows the wind change as the rear flank downdraught RFD changes the direction of the smoke and fire that threatens to engulf the homes. The final section of the videos show the impact of the firestorm on the estate at Windsor Downs. The storm, believe it or not, saved the day for the community. It may have been home videos though it was REAL LIFE video. The wall cloud was this one from a different angle:

http://
www.australiasevereweather.com/
photography/
photos/1995/0101jd11.jpg

Mal Ninnes may have been at work during the day but we appreciated his efforts in presenting the GPRS via the laptop onto the screen. The technology certainly aroused attention and discussion and should prove popular in times to come. I know some of the techno-buffs from the meeting are eager to buy one:)

Jimmy Deguara - > lucky last. Being the anniversary of the hailstorm that affected my region, I presented the outbreak of severe weather that affected Schofields and other parts of the state on the 20th September 1997. I went through the model data, satellite imagery, soundings and also the pictures taken during the event.

Thanks once again. Anyone is welcome to future meetings. Just contact me

jdeguara
@australiasevereweather.com

Next meeting will be in October and will be announced soon.

Jimmy Deguara