Confirmed Tornado
Burnstown, Ontario
August 10, 2004

Date- Local: Saturday, August 10th, 2004
UTC: Saturday, August 10th, 2004 .
Time- Local: 16:00 to 16:15 PM
UTC: 20:00 to 20:15
Location: 1 km north of Burnstown
Region: Renfrew-Pembroke-Barry's Bay
Classification: Confirmed Tornado
Category: A
Casualties: None
Track Length: ~2 Km
Width: 200-300 meters
Motion: ~070°
Damage Estimate: None available
F-Scale Rating: F1
Code: MB
Damage Survey: Yes
Spotter Reports: None
Other Documents:
Assessment of damage by Stan Siok and Denis Paquette on August 11th, 2004.
OPP reports of the tornado.
Eyewitness accounts of the tornado and its associated damage.

Tornado F-Scale Assessment

Marci Vanhoucke
Tornado Data Production Assistant, Environment Canada
May 18th, 2005.

Classification: Confirmed Tornado
Date: Saturday, August 10th, 2004.
Location: 1Km N of Burnstown, Renfrew-Arnprior-Calabogie

Assessment: F1
F-Code: MB
Explanation of Assessment: A sheet metal sheet metal shed was completely flattened and a barn roof was damaged. As well there was extensive tree damage.

Burnstown Tornado: August 10th 2004

Investigation by: Stan Siok, Warning Preparedness Meteorologist &
Denis Paquette, Outreach Officer, Environment Canada
Performed on August 11th, 2004

Severe Weather Type	F1 Tornado
Location	1 Km north of Burnstown (Renfrew-Calabogie-Arnprior Region)
Time	4:00 to 4:15 PM
Duration	Approx.3-4 minutes
Magnitude	Tornado up to F1
Path Length	~2 Km
Direction of Motion	~250°
Path Width	200-300 meters
Significant Damage	Extensive tree damage along a swath 200-300 meters wide and 2 Km in length. In some areas the damage was very dense with oaks and maples either uprooted or broken and twisted half way up the trunk. There was also a machine building completely flattened and a barn roof damaged.
.Damage Estimate (Source)	~ ?

Overview

On August 10th several bands of intense thunderstorm activity crossed Eastern Ontario throughout the day. This was in advance of an intense cold front which had strong dynamic support. Many of these cells were flagged by the SUDDS display (see figure 1). The OSPC Storm Summary (see attachment) indicated severe weather had occurred in Pembroke (hail and local flooding), Bancroft (tree and hydo line damage), Bonnechere Provincial Park (tree damage), Fitzroy Harbour (tree damage). There were two injuries associated with lightning from these storms. There was also a tornado confirmed in Thurso, on the Quebec side of the Ottawa Valley some 40 Km northeast of Ottawa with the same thunderstorm complex.

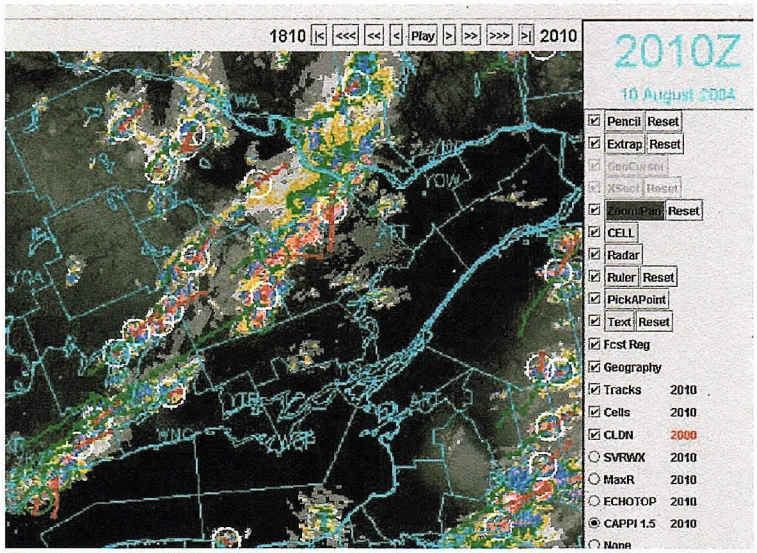

Fig 1: 20:10 UTC SUDDS radar display indicating a line of intense thunderstorm activity west of Ottawa.

This was perhaps the most active day from a severe weather perspective to affect Eastern Ontario so far this year and attracted considerable media interest. OSPC responded by issuing Watch/ Warning messages as of the morning hours. According to Mike Leduc, the storms, as detected by our radars, were exceptional in nature with numerous BWER's and MESO's observed. Tornado Warnings were issued for different sectors of Eastern Ontario as of 16:58 UTC and maintained as the intense cells moved towards the St. Lawrence Valley well into the evening hours of that day. In addition, spotters indicated the presence of funnel clouds in two locations (Pakenham and Richmond), as well as a wall cloud in North Gower.

Storm Survey

The following morning (August 11th) precise addresses of damage locations in the Burnstown, located 15 KM southwest of Arnprior were received (figure 2) and a storm assessment team was dispatched from Ottawa.

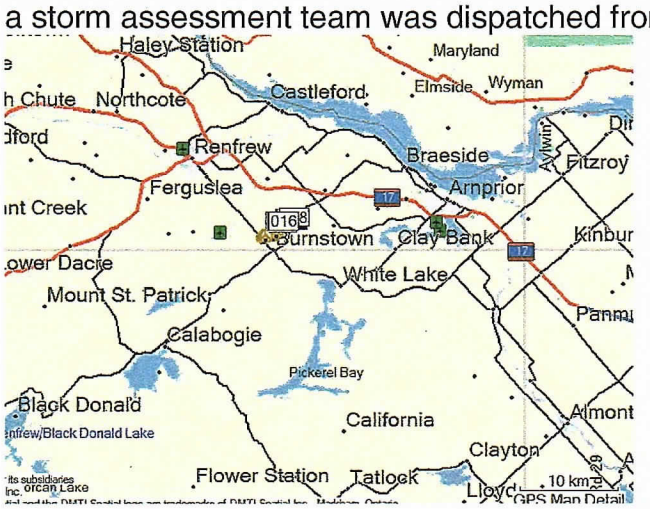

Figure 2: Location of Burnstown some 15 Km southwest of Arnprior
The actual area affected is some 1.5 Km north of Burnstown. The specific locations of some of the damages were identified using a GPS and are displayed in figure 3.

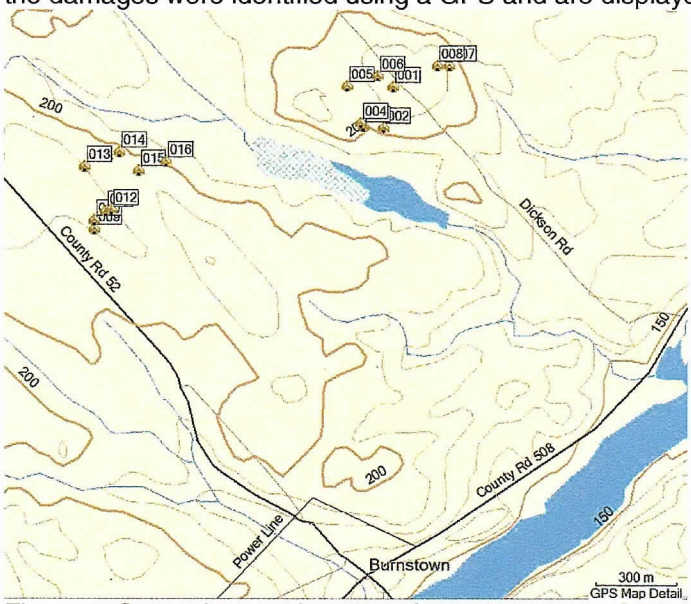

Figure 3: Some damage locations found by using a GPS system. The numbers (001 to 016) identify specific locations of some of the damage.

There were two properties surveyed on Dickson Road: the properties of Murray Burgess (1091 Dickson, near waypoint 001 on figure 3), and Brad Kauffeldt (1109 Dickson, near waypoint 006). Both locations sustained dramatic tree damage with numerous trees uprooted (figure 4) or snapped and twisted at the trunk (figure 5). Remarkably however, both the Burgess and Kaufeldt houses sustained little damage. The tree damage however was extensive and widespread as far west as waypoints 004 and 005. Many of the trees were of the hardwood variety (oak or maple). Immediately west of these points the tree damage appeared to thin out. The topography west of these locations drops markedly to below 190 meters elevation, whereas to the east it was in excess of 210 meters elevation. Further east, the tree damage area crossed Dickson road and several uprooted and broken trees were noted (Way points 007 and 008). East of these two waypoints, the tree damage became less widespread. The topography also drops off markedly in this direction to below 180 meters elevation. The general orientation of the fallen trees was towards the northeast (050°). However in a few locations the damage was towards the north (360°) while in other towards the southwest (210°).

Figure 4: some uprooted trees west of Dickson Rd

Figure 5: trees twisted and broken west of Dickson Rd.

The other area that was extensively surveyed was the Ron and Mona Frazer property on 2030 Burnstown Rd (County Rd 52 on figure 3). The main property damage was to the barn where pieces of tin roof were propelled some 250 meters towards the northeast (figure 6), and a machine building that was totally demolished (figure 7). There was some tree damage near the Frazer home, but more spectacular and widespread tree damage northeast of the property (waypoints 14 and 16) with trees either broken, shredded or uprooted (see figure 8). Beyond waypoint 16, the tree damage became less extensive as the topographical elevation dropped off to below 190 meters as one approached the stream (see figure 3). Beyond the stream, from waypoint 16, one could easily see at a distance the damage to tree tops on the other side of the stream, less than 300 meters to the northeast (070°). Thus, there appeared to be a positive correlating between elevation and the density of the tree damage with the more dense damage corresponding to the higher elevations.

It appears evident that the damage areas surveyed from Dickson Rd, as well as those off Burnstown Rd were associated with the same damage track. Although more sparse in nature, there were downed tree limbs within a few hundred meters northeast of waypoint 16. Taking into account the downed trees that could be seen visually in addition to the waypoints, the length of the damage track is about 2 Km, and its width 200 to 300 meters. The track orientation is towards the northeast (070°).

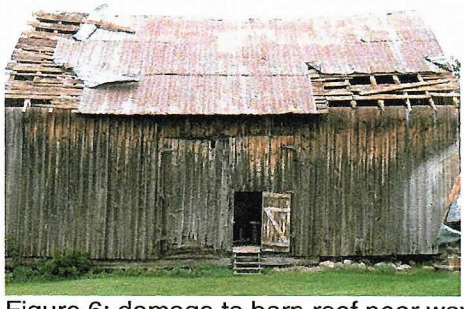

Figure 6: damage to barn roof near waypoint 009 on figure 3.

Figure 7: machine building completely flattened near waypoint 009 on figure 3.

Figure 8: Tree completely uprooted lifting large boulders near waypoint 015 on figure 3.

Interviews with witnesses

Mr. Kauffeldt was at home with his wife and children during the storm. The storm started "with torrential rain and hail the size of quarters". There was lull as the rain appeared to stop for a few minutes, and the sky appeared to brighten up. Then it started to rain again accompanied by intense winds. Mr. Kauffeldt quickly ushered his kids to safety. The sound was like that of a freight train as he "yelled at his wife across the kitchen table to get the kids in the basement." The estimated time was about 4:10 PM.

Mr. and Mrs. Frazer were also at home during the storm. Mr. Frazer said: "It first rained in torrents for about 10-15 minutes with lots of lightning". Then it lightened up a bit. "The wind and rain then picked and I could see that the trees whipping around almost touching the ground". Mr. Frazer indicated that he could see the cloud base that was "rotating in a counter-clockwise fashion and moving quickly". He also mentioned that there was a "loud roaring sound". Mr. Frazer estimated the time of the event to be shortly after 4:00 PM.

Conclusion

The relatively long and narrow track (2KM by about 250 meters) would indicate a tornadic event. This is supported by the statements of both witnesses. They stated that the destructive winds followed the heavy downpour by a few minutes. If this were a microburst, it would happen at the same time as the heavy downpour. The cyclonic rotation in the base of the cloud described by Mr. Frazer would indicate that a mesocyclone was present. The severity of the tree damage with numerous large hardwood trees uprooted or snapped at the trunk would put the tornado in the F1 category.

Tornado started at Burntown rd (county rd 52) ended past Dickson rd. Length of path approx 2km width 200 to 300 metres. Terrain both case high ground with a ravine between breaking the path.
001 1109 Dickson rd 1091 rd multiple large tree uprooted twisted or broken.

Waypoint 005 probable touchdown. Multiple trees broken and removed for area.

Waypoint 013 probable touchdown. Multiples tree broken and twisted.

Waypoint 009 Large Barn tin removed from both side of the roof. Picture inside and out.

Waypoint 018 to 021 Fitzroy Harbour scattered tree damage with one very large poplar tree.