Summer Severe Weather

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ICLR Friday Forum
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• Ontario Storm Prediction Centre
• Forecasting Technology
• Watch/Warning Program
• A closer look at August 20\textsuperscript{th} tornado outbreak
Ontario Storm Prediction Centre - Toronto
Computer Models...
Forecast Area of Responsibility
Scale of a Summer Storm

One storm covering part of a county
Scale of a Winter Storm

One storm covering thousands of square kilometres
Severe Weather Lead Times

- Summer Severe Weather (severe thunderstorms, tornadoes etc..) minutes to hours
- Winter Severe Weather (heavy snow, freezing rain, strong winds etc..) — hours to days
Weather Watch vs. Weather Warning

- Weather **Watch** means there is the potential for severe weather
  --- Be Alert

- Weather **Warning** means that severe weather will soon occur or is occurring
  --- Take Action
Severe Thunderstorms – A Breed Apart

• 5% of Ontario thunderstorms are categorized as severe each year…
• Severe thunderstorm has one or more of the following characteristics
  – Wind gusts of 90 km/h or more
  – Hail of 2 cm diameter or larger (size of a nickel or larger)
  – Flooding rains
  – Tornado(s)
By the Numbers

- On average around 120 summer severe events in Ontario each season (late April to early October)
  - 70 due damaging winds
  - 20 heavy rain/flooding
  - 20 hail
  - 11 tornadoes
**Fujita Wind Damage Scale**

- **F0** – winds up to 115 km/h
  - Shingle, siding damage
- **F1** – winds 120 to 170 km/h
  - Numerous shingles, partial roof removal
- **F2** – winds 180 to 240 km/h
  - Roof removed from well-built home
- **F3** – winds 250 to 320 km/h
  - Roof and some exterior walls removed
- **F4** – winds 330 to 410 km/h
  - 2 storey brick house left with only a few walls remaining
- **F5** – winds 420 to 510 km/h
  - Brick house destroyed to foundation
Tornado Characteristics

- Duration
  - 5 minutes to 120 minutes
- Speed of Motion
  - 30-70 km/h
- Path length
  - Less than 1 km - 150 km
- Path Width
  - 10’s of metres - 2 km
- Direction of travel
  - Usually southwest to northeast

- IMPORTANT – Appearance of Tornado NOT an indication of its strength
Ontario Tornadoes

• Vast majority are either F0 or F1
• 1 F2 every year or so
• 1 F3 every 8 years or so
  – Last confirmed Ontario F3 Violet Hill, April 20, 1996 – OVERDUE!
• 1 F4 every 15 years or so
• No confirmed F5’s in Ontario – OVERDUE?
Tornado Warnings

- Strong evidence on radar
  - Rotation at multiple levels in storm…however…
  - “hook” echo
- Credible Eyewitness/Video Report
  - CANWARN trained spotter
  - Police/Fire/Municipal Official
  - Multiple public reports/videos…right place at right time
CANWARN Storm Spotters
Project OPPortunity
CANWARN/OPP reports important…

- Ground-truth info from radars, lightning detector and satellites
- Help protect members of the affected community and communities where storm may be headed
- Information could be used to issue/update Watches and Warnings
August 20th 2009 Tornado Outbreak

Jeff Scheper
Staying on Top of the Weather

Media: CTV.ca, CBC.ca, Global

Internet: Weatheroffice

Weatheradio

Cell Phone/PDA
Time to React

- May be a few minutes or less
- Not all storms will have a watch/warning
- Not all storms will be easily visible
  - Haze
  - Rain
  - Surrounding hills or trees
- Preparation before event is key
  - Check weather before going out...keep an eye on the sky
  - Where is my best shelter?
  - React...
Ways Forward

• How do you alert people for the most significant of events?
  – National Alert System?
    • Red banner on TV
    • Interrupt radio broadcasts (syndicated programming?)
  – Cell phone alerting?
    • Liability for cell phone companies if system unable to handle all the alerts that need to go out?
  – Reverse 911?
  – Sirens?

• Education
  – If caught outside do....