National Weather Service
Storm Damage Surveys

Ohio EMA Spring Director’s Conference 2018
Presentation Goals

• Provide a NWS perspective of storm damage surveys

• Outline how EMA partners can be involved with the storm damage survey process

• Discuss the integration of Unmanned Aerial Vehicles (UAVs) or drones into NWS surveys
Storm Damage Surveys:
First Determine Straight-Line (Downburst) or Tornadic

Downburst
Damage is blown over

Tornado
Damage is blended
Purpose of Storm Surveys

• Scientifically document a tornadic event for historical and research purposes

• Document:
  • Path Length (beginning and end points)
  • Path Width
  • Intensity of damage
  • Time of damage
  • Debris patterns
Damage Survey Planning

- We develop a plan for survey locations based on several factors, in coordination with local EMA.
Damage Survey Process

- Conducting the survey:
  - Assess location and severity of damage.
  - Discuss the event with eyewitnesses.
The Survey – Damage Indicators
Enhanced Fujita (EF) Scale

- Damage scale – converted to wind/EF rating

<table>
<thead>
<tr>
<th>EF Rating</th>
<th>Wind Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF 0</td>
<td>Up to 85 mph</td>
</tr>
<tr>
<td>EF 1</td>
<td>86-110 mph</td>
</tr>
<tr>
<td>EF 2</td>
<td>111-135 mph</td>
</tr>
<tr>
<td>EF 3</td>
<td>136-165 mph</td>
</tr>
<tr>
<td>EF 4</td>
<td>166-200 mph</td>
</tr>
<tr>
<td>EF 5</td>
<td>Over 200 mph</td>
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</tbody>
</table>
Mapping the Damage
Mapping the Damage
Partnerships Utilizing UAVs

Optimizing Time During Damage Assessments

Presented by: Michael Lewis
Ohio EMA Spring Directors’ Conference

National Weather Service – Your Weather Needs, Your Weather Service
Partnerships Utilizing UAVs
Partnerships Utilizing UAVs

Connecting the Dots

UAV Image Capture – Video provided by: Scott Jordan
Building the Path

- Pop up – Orientation
  - Flight level 75 to 150 feet AGL
  - Point north
  - Slow Scan Clockwise (N-E-S-W-N)
  - Find the TOUCHDOWN location
    - Point Camera toward touchdown
    - Fly toward touchdown
- Slow Scan Clockwise
  - Orient North
  - Return to origin point
Build the Path – Midway to End
• Flight path ALONG and to the SHADOW side of the path
• Try to keep the path between the drone and the Sun
• Captures shadows better
• Try not to scan any one damage zone too long
• You can always return

Locate lift / end point

UAV Image Capture – Video provided by: Scott Jordan
Partnerships Utilizing UAVs

Survey Best Results
Thank You!

Are You Weather Ready?

Weather-Ready Nation Ambassadors