Hail Verification and Analysis Research

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Hazardous Weather Forecasts & Warnings
Evaluating a hail algorithm or how many ways can you measure a hailstone?

NSSL Hail Swath algorithm (WDSS-II)

1 km² resolution grid
Available nationwide
Many users, including NWS
### Historical Hail Verification Collection

#### Field Projects

- **Geographic extent**
- **Safety/cost**

#### Warning Verification

- Only one verification point needed to verify a warning
- Sparse reports
- Incorrect hail sizes
- Severe reports only
- Limited evaluation

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Fig. 2. Reporting postcard used by volunteer observers.
2006: Leveraging New Technology To Meet Research Needs

Technology
- 2006: Google Earth released
- Overlay WDSS-II data
- Gas stations, fast food, banks, etc. already in Google Earth
- Reverse look-up techniques

Research
- Algorithm evaluation
  - Accurate verification data
- Probabilistic hazard information
  - Precise verification data
Quick Review: Current Hail Verification

- Sparse
- Only severe reports
  - \( \frac{3}{4} '' \) + hail
Severe Hazards Analysis and Verification Experiment (SHAVE)

- Phone calls to conduct surveys
- Student-run, student-led
- Remote high resolution verification of:
  - Hail
  - Wind damage
  - Flash floods
Informal Tech Transfer: SHAVE to NWS

“The SHAVE project inspired some of us to utilize Google Earth in operations in real time to try and get real time reports, as well as a sense of the intensity of storms as they are happening. As a result...severe thunderstorm warning [accuracy] increased from 49% to 60%”

-NWS Warning Coordination Meteorologist (20 Jan 2009)
SHAVE
(2006-2008)
21,637 data points collected

http://ewp.nssl.noaa.gov/projects/shave/