Status of Karst Mapping in Ohio: Sinking Spring

Douglas Aden
Ohio Department of Natural Resources
Division of Geological Survey
Outline

- What is karst
- Methods
- Field verification
- Review of current karst area
What is Karst

- Forms by dissolution of
  - Carbonates (limestone or dolomite)
  - Evaporites (gypsum or salt)
- Characterized by
  - Sinkholes
  - Disappearing streams
  - Caves
  - Springs
Locating Sinkholes

- Extract depressions from DEM (fill, minus)
- Automate removal of very small and very shallow depressions
- Manually check remaining depressions in Arc
- Field verify to find:
  - Points newer than the DEM
  - Points not revealed by DEM
Known and Probable Karst in Ohio
Map EG-1, revised 05/2007

Sinking Spring
Results of Initial Processing
Results of Automatic Model
Final Results Including Field Verification
Benefit of Including >0-1 ft.
Field Verification

- Stream bank/water reflections
- Culverts/bridges
- Storm drains
- Foundations
- Ponds
Failing drain tile
Benefits of Field Work
Deep active sink.

- Not on DEM
- Location mentioned by owner
- Sent the younger brother down 40ft on a rope
Known and Probable Karst in Ohio
Map EG-1, revised 05/2007
Sinking Spring
Spring Above Sink
Groundwater Contamination
Trash Filled
Flooded Sink
Sink Nearing Road
All Roads Lead to Sinkholes
Collector
Plumbing the depths
Reactivated sink with cave
10-15 year old sinkhole
18x25ft, 9ft deep.
Solution

Enlarged Fracture
Fracture enlarged via karst processes
Enlarged fracture infilled with sediment, possibly glacial
Trees grow on top
Deeper karst reactivates from below
Summary

- **Sinking Spring**
  - 1741 field verified points
  - 125 springs
  - 326 suspect points
  - 140 points left to field check

- Sinkholes clustered along valley rims
- Springs above and below sinkholes
- Fracture solutinal timing based on soil and trees