Characterizing Karst Terrane in Illinois

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1) 2009 USDA aerial photograph showing the location of the Confined Animal Feeding Operations site (upper center of photo) in northeastern Jo Daviess County. Note the relative size of the facility as compared to the adjacent town of Nora, Illinois.

2) 2008 LiDAR elevation image of the ground surface for the same geographic area. The enhanced resolution of the LiDAR data depicts numerous linear topographic features extending across the region.

Jo Daviess County, Illinois

Early in 2008, the Illinois State Geological Survey (ISGS) was asked by the Jo Daviess County Board and the Illinois Attorney General’s Office to assess the suitability of sites in eastern Jo Daviess County to host Confined Animal Feeding Operations (CAFO). Analysis of the sites, which ISGS had previously mapped as karst, included LiDAR elevation data, combined with aerial photography, and field work. “Karst” refers to a landscape underlain by limestone or dolomite and contains crevices and conduits (which are open to the ground surface via sinkholes) through which groundwater can flow rapidly. These waters are highly susceptible to surface-borne pollutants and can quickly transport contaminants to water supply wells.

Interpretation of the LiDAR elevation data provided information on lineaments (usually solution-enlarged bedrock crevices) and large sinkholes. This information along with the aerial photography and field work, facilitates location of sinkholes, enlarged crevices and springs. Karst features on the ground surface have been found to coincide with lineaments mapped using LiDAR elevation data. Lineaments that may be groundwater flow paths cross both proposed CAFO sites and the adjacent fields where manure application is planned are problematic. Potential for groundwater contamination in karst areas, suggests LiDAR elevation data have great value for detailed characterization of CAFO sites and adjacent affected lands.

For Additional Information:
Illinois Height Modernization Program

crystal.isgs.uiuc.edu/nsdihome/webdocs/ilhmp/

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