Using GPS, GIS, and Remote Sensing as a Soil Mapping Tool

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The basic objective of soil surveys is the same for all kinds of land, although the number of mapping units, their composition, and the detail of the mapping vary with the complexity of the soil patterns and the specific needs of the users. With the increased interest (needs) in site-specific management (precision agriculture) conventional soil survey maps may not be of an adequate scale to allow a producer to manage crop yield in a site-specific management scheme. Traditionally published soil survey mapping is done on a scale of 1:15840; however, site-specific management practices require a higher resolution (larger scale) of soil mapping in order to capture yield variability within a field.

The objective of this project was to aid the soil scientist in delineating soil units on a field scale basis by using GPS, GIS, and remote sensing technologies. The area of interest involved approximately 48.5 ha (120 ac) at the Davis Purdue Agricultural Center located in Farmland, Indiana. A first-order soil survey was performed over the area of interest on a scale of approximately 1:500. Remotely sensed images, topographic maps on approximately 15 cm (6 in) contours, and yield maps were provided to the soil scientist to aid them in mapping. A GPS unit, pen-based computer and GIS software were also used in performing "in-field digitizing" of the soil boundaries. The results demonstrate how the implementations of these technologies aid in the creation of high-resolution (large-scale) soil survey mapping units.

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