

CONSTRUCTION METHODS FOR A COUNTY-WIDE LAND USE/COVER MAP

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Abstract—Laboratory of Geometronics, through a cooperative agreement with the Big Sandy Area Development District, has constructed a GIS-based, county-wide digital land use/cover map to facilitate county-level economic development and resources management planning efforts. The construction procedures described can readily be used for projects of similar scope and objective.

The procedures of map construction are: (1) photointerpretation, (2) photogrammetric transformation, (3) scanning, (4) georeferencing, (5) vectorization, (6) data editing, and (7) cartographic manipulations. Detailed processing is presented below.

Sixty seven vertical aerial photos taken in March of 1997 by the National High-altitude Photography Program were acquired for photointerpretation. Photointerpretation was performed by viewing stereo pairs under a stereoscope while land cover types identified and marked. Land use polygons marked on the photos were then transferred to fourteen USGS 7.5' quadrangle topographic maps using a sketchmaster. These topographic maps were treated as the project's base maps in a GIS. In 1-bit monochrome mode, based maps with land covers identified were scanned at 100 dpi. This process converted polygonal features on base maps to their corresponding raster images. Using a set of ground control points collected on additional reference materials, raster images were georeferenced in Arc/Info. Georeferenced raster files were subsequently vectorized which converted raster images to grid files in Arc/Info. Next, boundary lines for all land use polygons were traced to produce vectors, using grid files in ArcTools. These vectorized polygons were then saved as a GIS coverage. Fourteen GIS coverages of land uses were

merged, in Arcedit, to form a single coverage. The resulting coverage were attributed in Arcview by assigning land use types to polygons. The next step was to dissolve, in Arc, boundaries of polygons having the same attribute values (i.e., land-use types). After a georeferenced land-use coverage was built, several cartographic treatments were applied to the coverage in Arcview. These treatments included: (a) a 1000-meter UTM grid coverage and markers, (b) a 5-foot longitude/latitude grid coverage and markers, (c) other legends common to all paper maps.

Following the above outlined procedures, a color-coded county-wide land use maps was successfully constructed. The Magoffin County Land-Use Map is in U.S. State Plane Coordinate (Kentucky South) and North American Datum of 1983. The table below summarizes Magoffin County Land Uses.

Table 1—Magoffin County land uses

	Area	Percentage
	<i>Acres</i>	
Agriculture land	19,986.88	10.09
Barren land	2,277.99	1.15
Deciduous forest	163,262.51	82.42
Mixed forest	415.98	0.21
Stripped mine	9,389.28	4.74
Urban land	2,674.16	1.35
Water body		
(exclude streams)	99.04	0.05
Total	198,086.04	100.00

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