4.0 GIS DATA ACQUISITION AND INVENTORY

4.1 Introduction

Data gathering and GIS database development were a major part of this project. The creation and compilation of GIS data was focused on natural resources and watershed protection providing the foundation for a GIS watershed planning decision support system. These data should be used and distributed for future planning projects in order to support the overall Bonne Femme Watershed Project goals and objectives.

4.2 Methods

With the County's assistance, AES obtained existing GIS layers pertaining to natural resources as well as other data relevant to meeting project goals. AES worked specifically with Missouri Spatial Data Information Service (MSDIS) and Missouri Resource Assessment Partnership (MoRAP) as well as other partners such as the Boone County Planning and Building Inspection Department to compile this information.

AES has gathered the digital version of the readily available regional data that are outlined in the proposal. AES has prioritized its data-gathering according to the request for proposal as well as the layers that are most pertinent to creation of the sensitivity analysis. AES has gathered additional necessary information and/or data when available and within the project budget. Data were compiled into a comprehensive GIS database and map/graphic products.

All appropriate and available digital data for the study area have been reviewed for quality, scale, applicability, and usefulness and put into Missouri State Plane Coordinate System, Zone 4426, Units Feet, and referenced to NAD 83. All appropriate and prioritized data have been acquired accordingly and used in the synthesis of base maps, data maps, information for fieldwork, and other purposes.

4.3 Results

The results of the data gathering stage of the project have been summarized in tables 4.1-i through 4.1-vii.

Table 4.1-i. AES and Space Imaging Created Data Layers

Data Layer	Source	Result
IKONOS Pro Imagery 1-meter resolution, Orthorectified/4-band multispectral true color and color infrared	Space Imaging IKONOS Satellite	Created
Impervious Surface 1-meter resolution	Space Imaging Data Creation	Created

Subwatershed Boundaries	AES Data Creation	Created
Stream Sinuosity	AES Data Creation	Created
Stream Slope	AES Data Creation	Created
Stream Sensitivity Analysis	AES Data Creation	Created

Table 4.1-ii. High Priority Data Layers

Data Layer	Source	Result
Major streams and tribs.	Boone Co. GIS Dept./USDA-ARS	Collected
Watershed/subwatershed Boundaries	AES Data Creation/ USDA-ARS	Created/Collected/Enhanced
Spring and cave recharge areas	Most recent studies/USDA-ARS	Collected
Topography 30 m DEM	MSDIS/USGS	Collected
Soils (SSurgo)	MSDIS/NRCS	Collected/Enhanced
LU/LC	MSDIS/USGS	Collected
Impervious Surface	Space Imaging	Created/Enhanced
Hydrologic Soil Group	MSDIS/NRCS	Created
Geomorphic stream stability classification	AES Creation	Created
Stream Sensitivity	AES Data Creation	Created

Table 4.1-iii. Medium-High Priority Data Layers

Data Layer	Source	Result
Losing/Gaining Streams	Previous Studies/DNR/USDA-ARS	Created
Runoff Potential	AES Data Creation	Created
Current Zoning	Boone Co. GIS Dept.	Collected/Enhanced
LU/LC Change 1970-2000	Created a Building Density to Supplement	Gap
Roads	Boone Co. GIS Dept.	Collected
Traffic studies/CATSO	Boone Co. GIS Dept.	Collected
Karst areas/sinkhole plains	MSDIS –Geology/ USDA-ARS/AES Creation	Collected/Created
Riparian buffers	AES Data Creation	Created
Point discharges	MSDIS	Collected
Aerial photos	Boone Co. GIS Dept.	Created/Collected
Species of concern	MDC	Collected
Potential point pollution sources	MISDIS	Collected

Table 4.1-iv. Medium Priority Data Layers

Data Layer	Source	Result
Ephemeral/permanent streams		Gap
Interm. land use		Gap
Subdivisions		Gap
City boundaries	Boone Co. GIS Dept.	Collected
Proposed or planned infrastructure changes		Gap
Population density	AES/Cadastral files	Created
Public sewer and water system		Gap
Growth of city boundaries	Boone Co. GIS Dept./TIGER	Collected

Table 4.1-v. Medium-Low Priority Data Layers

Data Layer	Source	Result
Hydrologic changes	AES Created	Created
Known subterranean water flow	MSDIS/USDA-ARS	Collected
Pre-settlement land cover	MSDIS	Collected
Proposed Development	Boone Co. Planning Dept/AES Creation	Collected/Created

Table 4.1-vi. Medium Priority Data Layers

Data Layer	Source	Result
Karst and cave locations	USDA-ARS	Collected
Water quality sampling sites	EPA/USGS/MSDIS	Gap
Stormwater treatment practices		Gap
Septic systems distribution/age		Gap
Parcel boundaries	Boone Co. GIS Dept.	Collected
Street map	Boone Co. GIS Dept.	Collected
Political jurisdictions	Boone Co. GIS Dept./TIGER	Collected
Service locations	Boone Co. GIS Dept./TIGER	Gap

Table 4.1-vii. Other Data Sources AES Collected

Data Layer	Source	Result
Projected land use	Collaboration between Boone County Planning and AES	Created

Flow velocities	AES modeling	Created
Estimated flow velocities	AES modeling	Created
Floodplain boundary	FEMA	Gathered
Subwatersheds, catchments and associated stream segments	AES creation	Created
100ft/200ft buffers and % of NLCD vegetation	AES creation	Created
High resolution: DEM, slope, aspect, hillshade (25 ft grid)	AES creation	Gathered/created
Landscape function matrix/link table and associated grids (biodiversity, habitat, water quality, flood protection, ground recharge and overall score)	AES creation	Created
Dams	MISDIS	Gathered
Digital Raster Graphics	USGS	Gathered
CIR Imagery	MISDIS	Gathered
Gazetteer Raster Scan Graphic	AES Created	Created
Digital Ortho Quads	MISDIS	Gathered
Field Cross-sections	AES Creation	Gathered
National Wetlands Inventory	USFWS	Gathered
Map Index Layers	AES Creation	Gathered
Precipitation Data	NOAA/NWS	Gathered/Enhanced
303d Streams	MISDIS	Gathered
2ft Topographic Data	Boone County Planning	Gathered
2000 Tiger Data	US Census	Gathered
Sensitive Hydrologic and Ecologic Soil Types	AES creation	Gathered/Created

4.4 Discussion

It is AES' opinion that Boone County is ahead of the curve in terms of available GIS data. This is because of the collaboration and high performance levels by the Boone County GIS Department, University of Missouri, MoRAP and MSDIS. There were a number of high-resolution data sets that improved this study significantly, including parcel information, centerlines, and digitized streams. The IKONOS imagery and the high resolution impervious classification also proved to be very valuable. It should be noted that high-resolution land use and/or land cover as well as high resolution topographic data would have aided in the process significantly. Both of these data layers would have improved the accuracy and efficiency of this project. Also, if AES would have had the high resolution topography data for the entire study area, sink holes and karst features could have been easily mapped.