Building a Geographic Framework for a Storm Water Master Plan

Mid-West / Great Lakes ARC/INFO User's Conference

November 5, 1999

Joe Adcock, AICP

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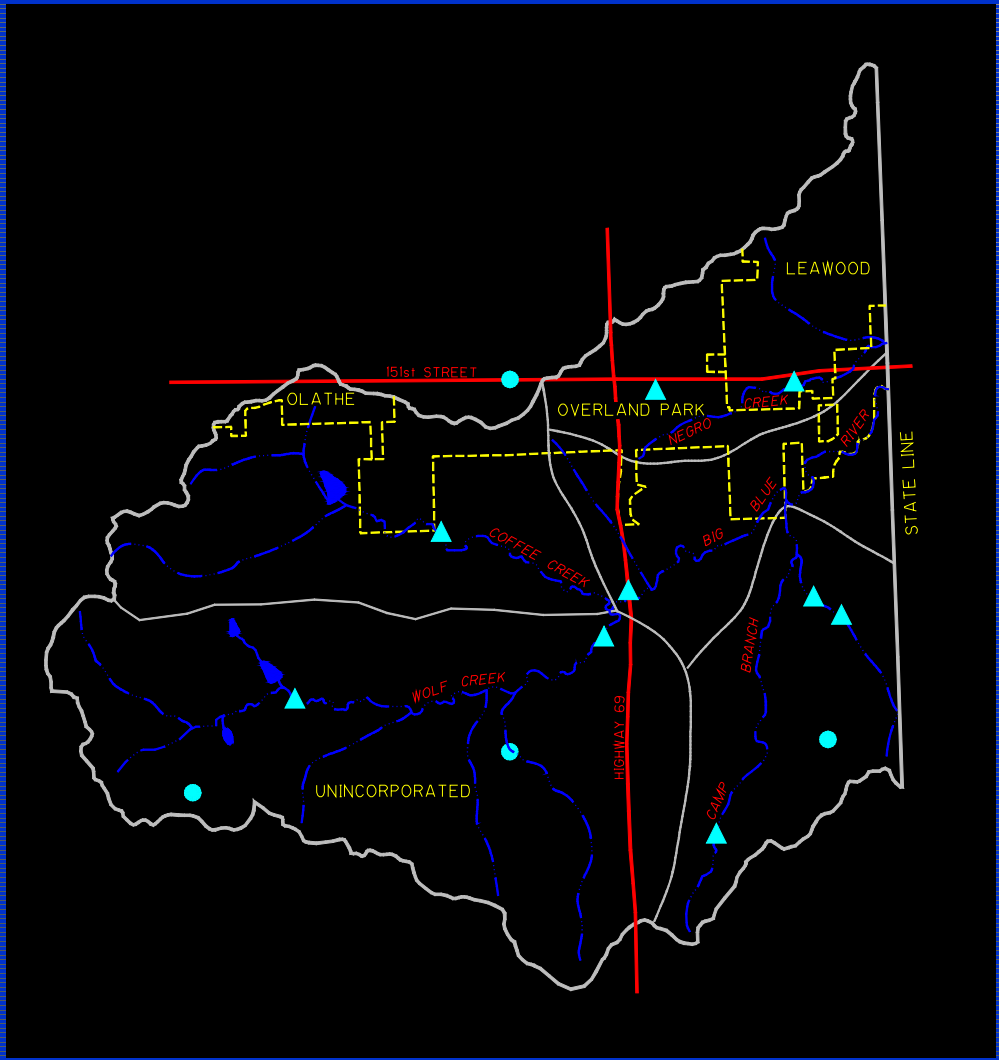
Upper Blue River Primary Channel System



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Overview of Project

- Develop a Stormwater Master Plan
  - Approximately 80 square miles
  - 800 cross-sections
  - 100 structures
- Update FEMA Floodplains
- Develop Approach to Manage Future Growth and Development

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GIS Goals

- Maximize on Investment in GIS Data
- Develop Standards for Using GIS tools to Process Stormwater Data
- Make results of master plan available for other uses

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Available Data

- NEW GIS Data
  - Streams, Contours, Roads, Buildings,
    - Data Developed to Support Stormwater Program
- Existing GIS Data
  - Parcels, Roads, Political Boundaries, Parks, etc.
    - Data Developed for General GIS use

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GIS Planning Issues

- Data Storage and Management
- Applying Data to Stormwater Master Planning

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Data Storage & Management

- Uniform approach for multiple studies
- Transferable format / platform
- ARC/INFO Based
- Relational Database
- Plan for ARC 8.0

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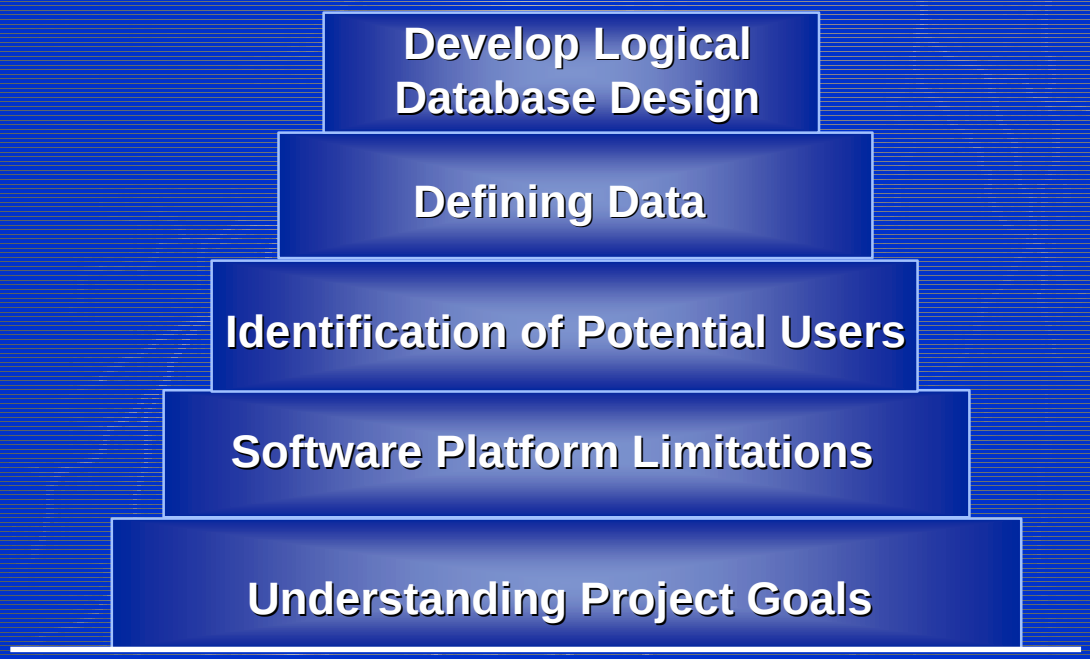
Database Design Process



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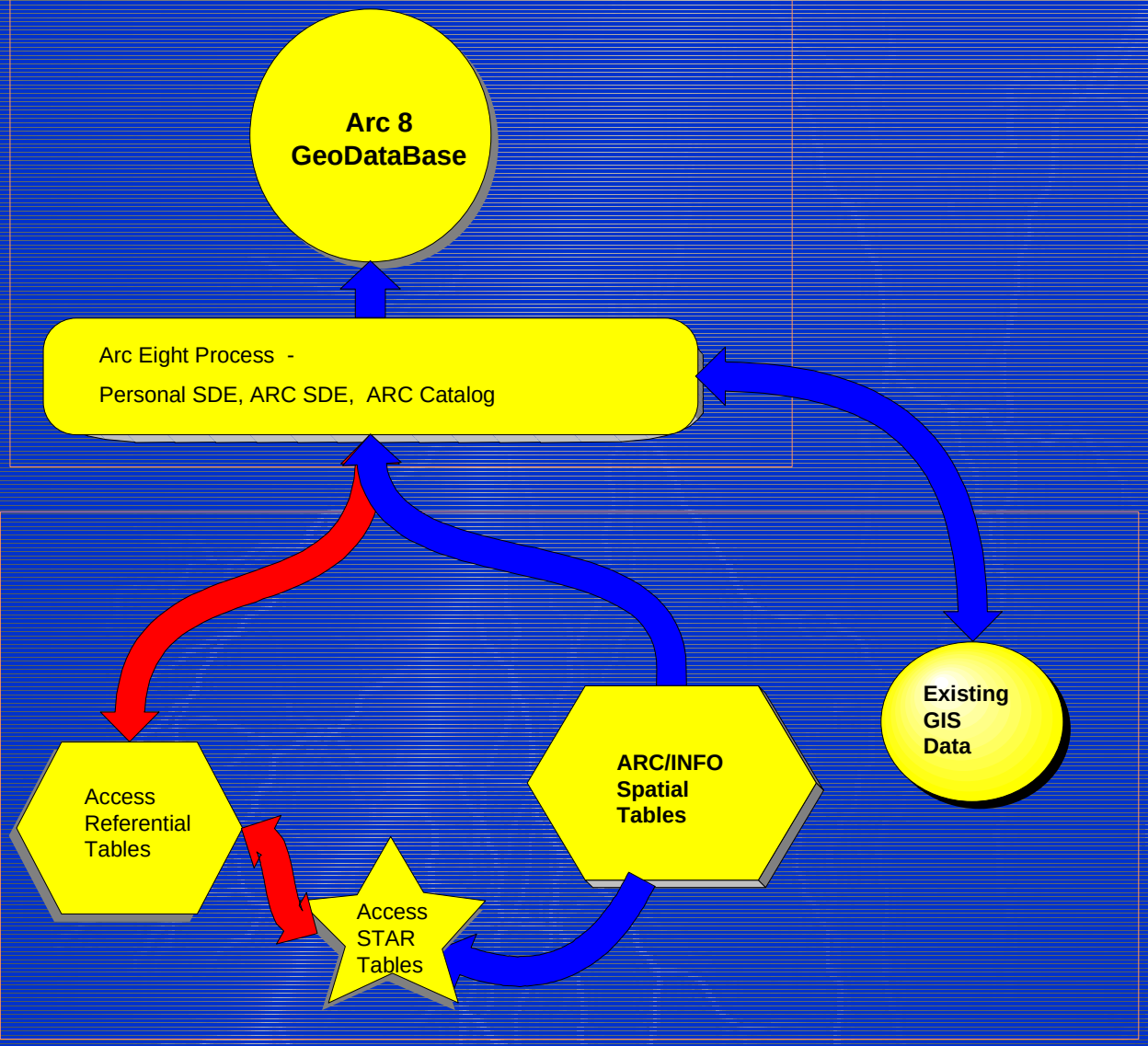
Data Types

- Geographic Data
  - Generally ARC/INFO Data providing reference to Physical Location
- Relational Data
  - Describes Physical features, such as size of bridge, slope of stream, extents of subbasins
- Model Data
  - Model input/output files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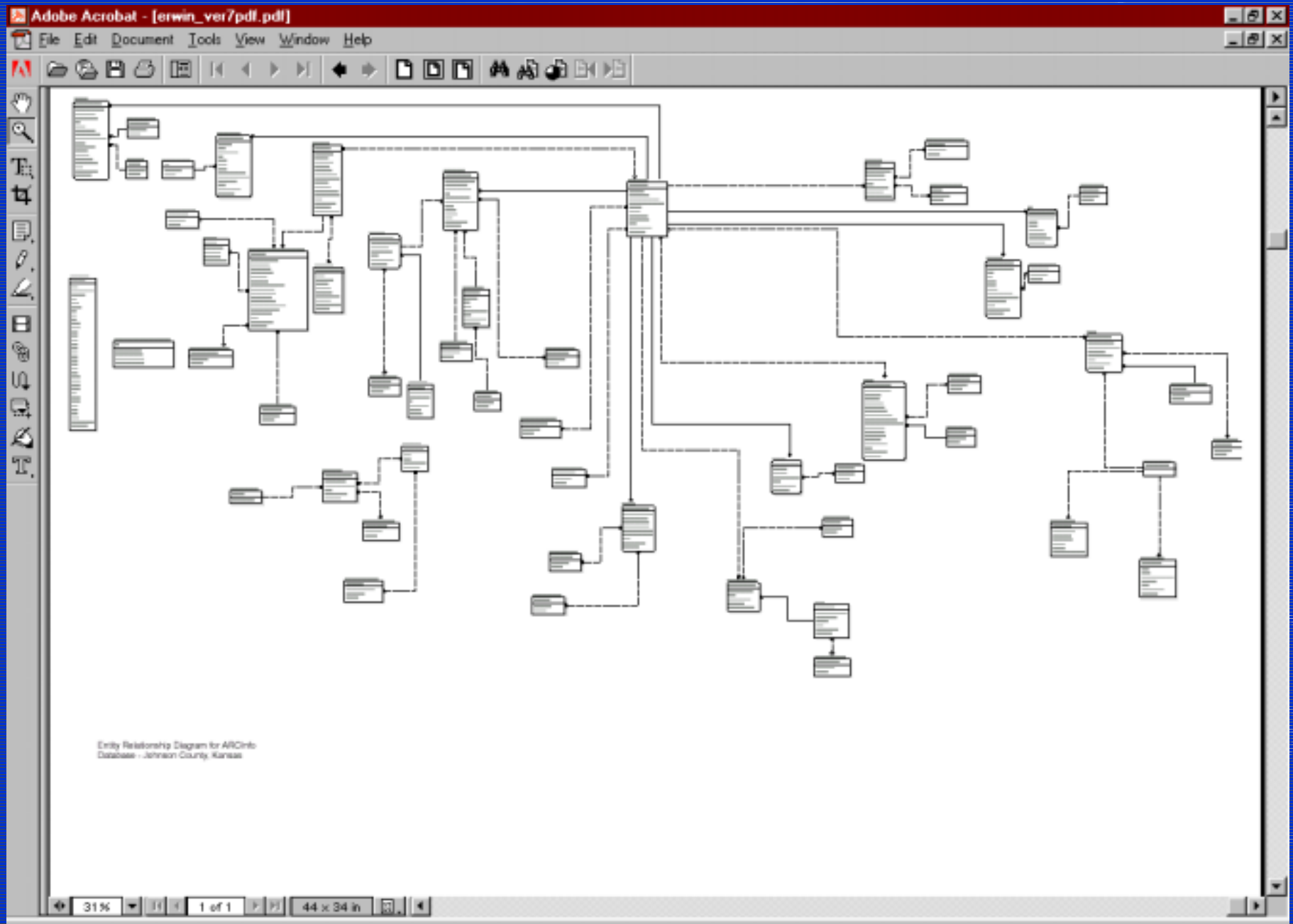
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Entity Relationship Diagram for ARCInfo
Database - Johnson County, Kansas
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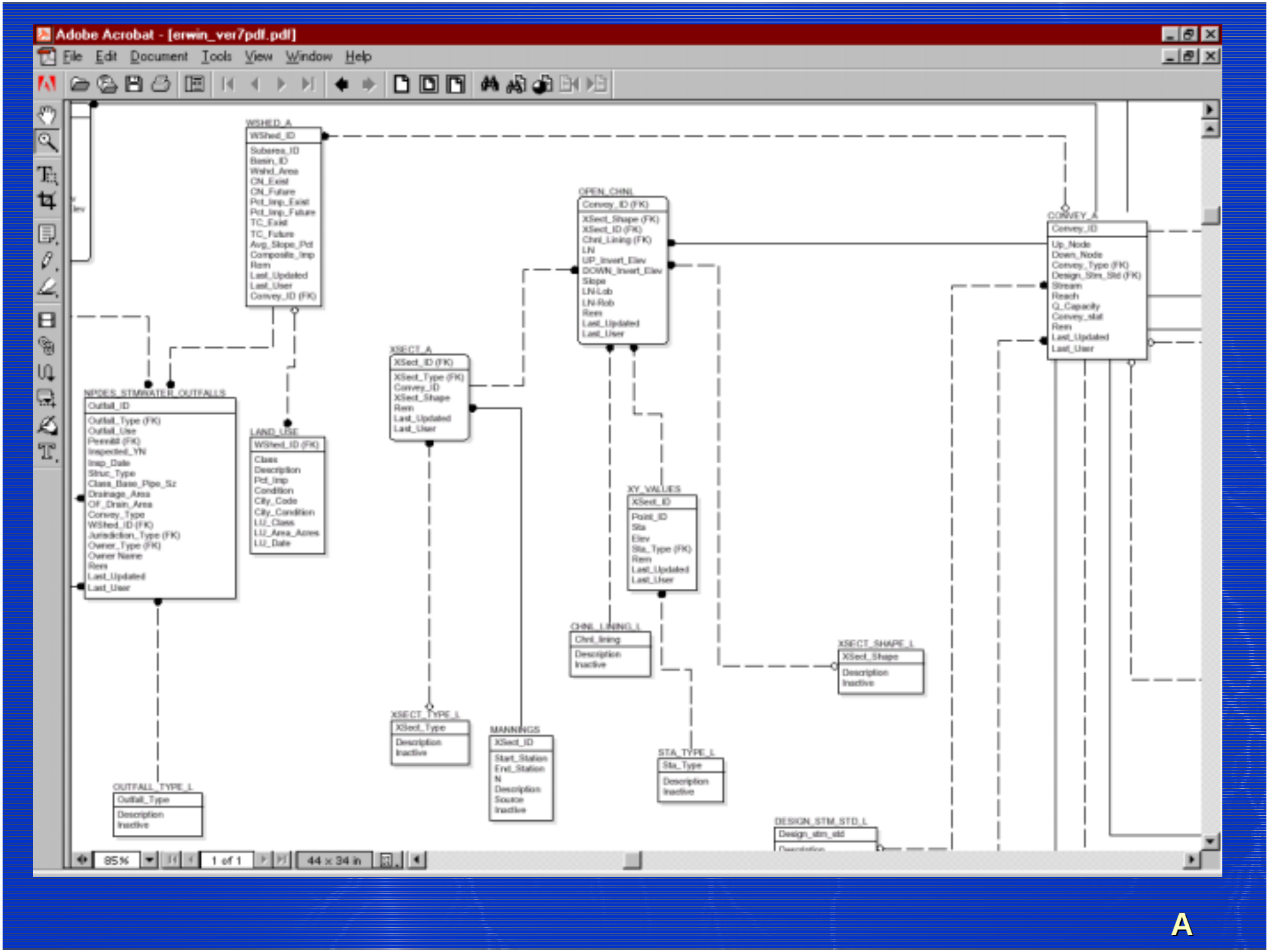
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Using GIS Data

In Johnson County, GIS Data is the most up to date data on the watershed. Therefore, the new GIS data should be primary source for modeling data.

Ways to Use GIS Data

- Basin/Subbasin Delineation
- Processing of Landuse, Soils, and other physical Data
- Establishment of flow paths
- Exporting Cross-sections
- Displaying Results/mapping floodplains
- Evaluating Impacts of Alternatives

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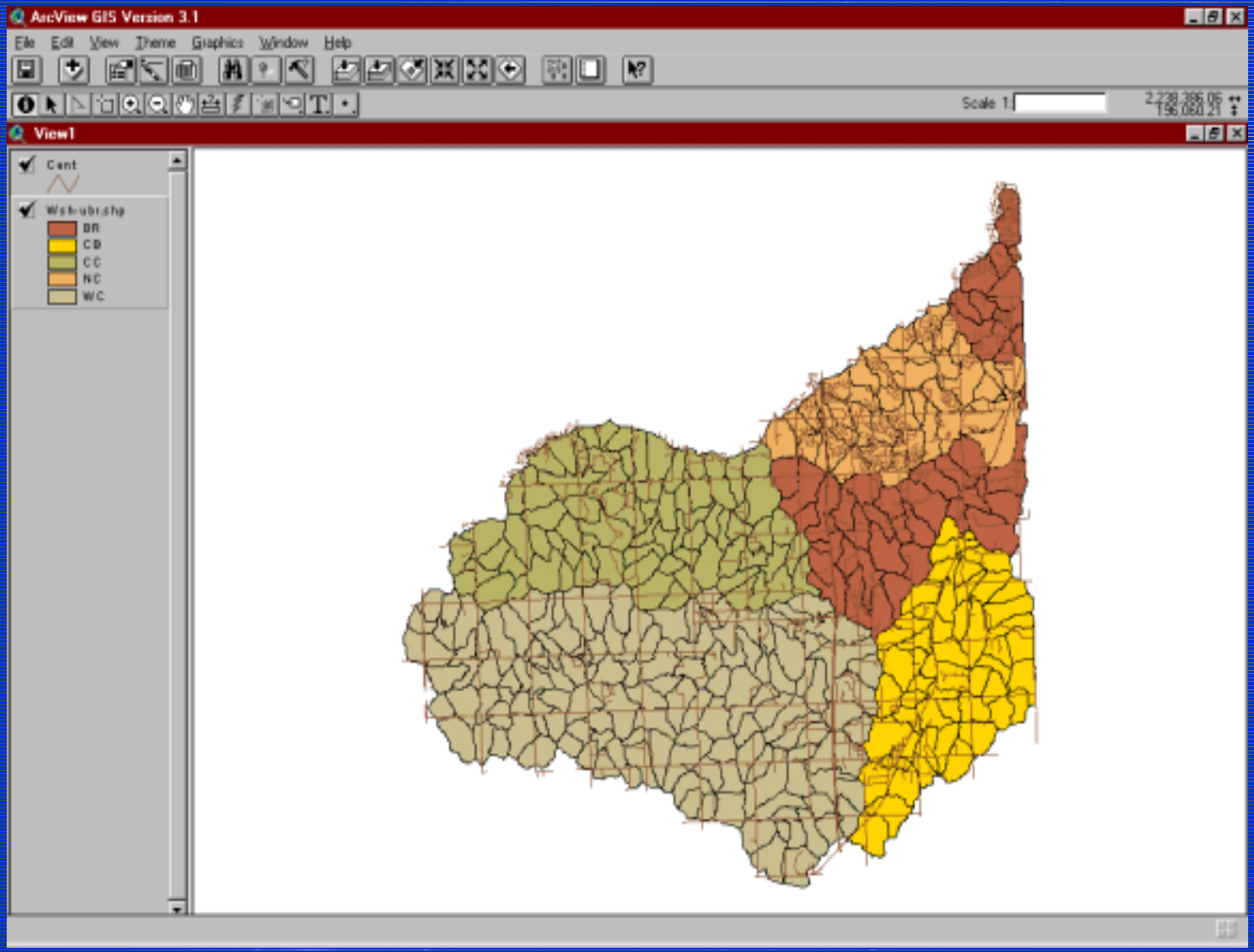
Must Document Procedures

Blue River is 1st of Six watersheds to be studied in Johnson County

Basin Delineation



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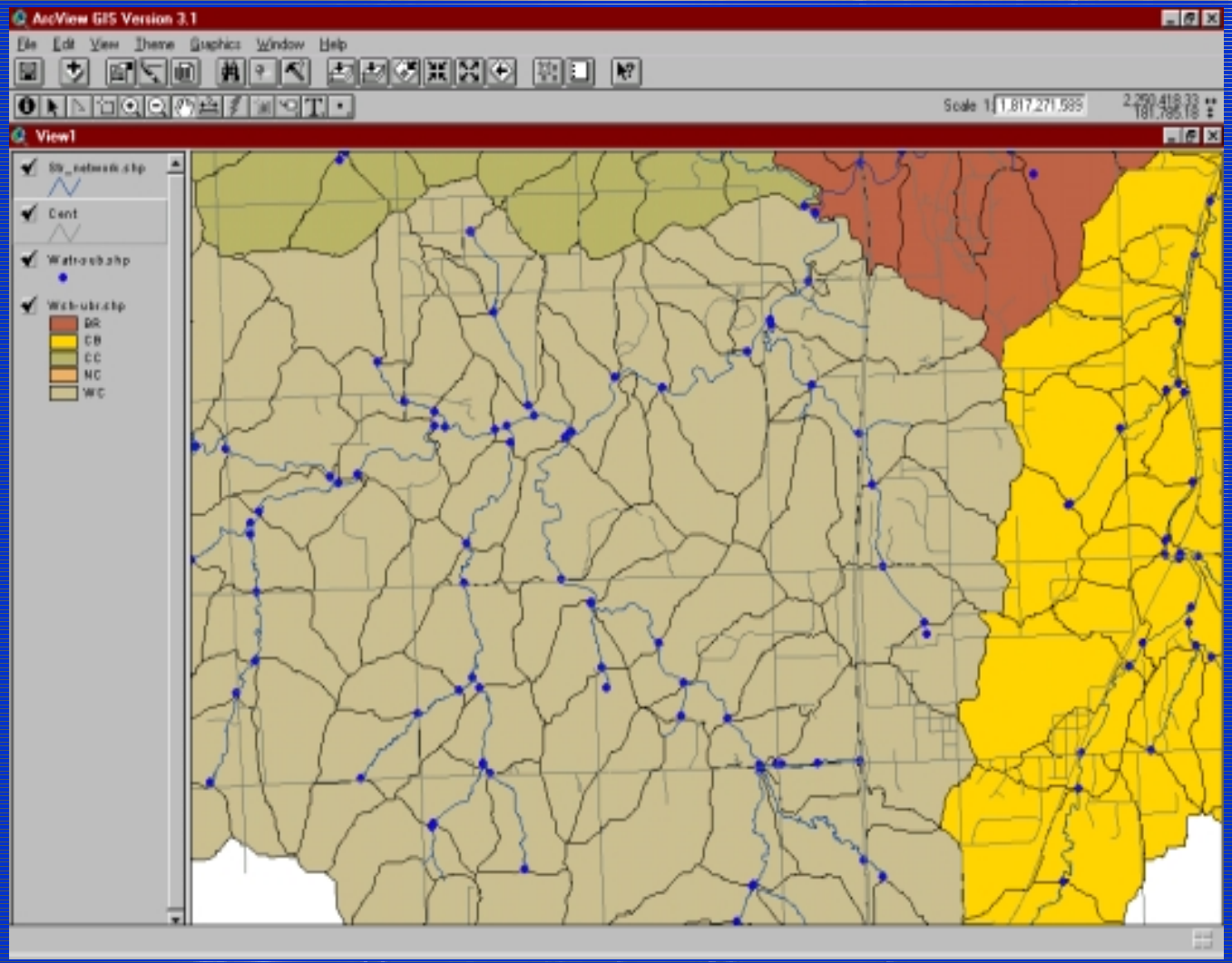
Basin Delineation



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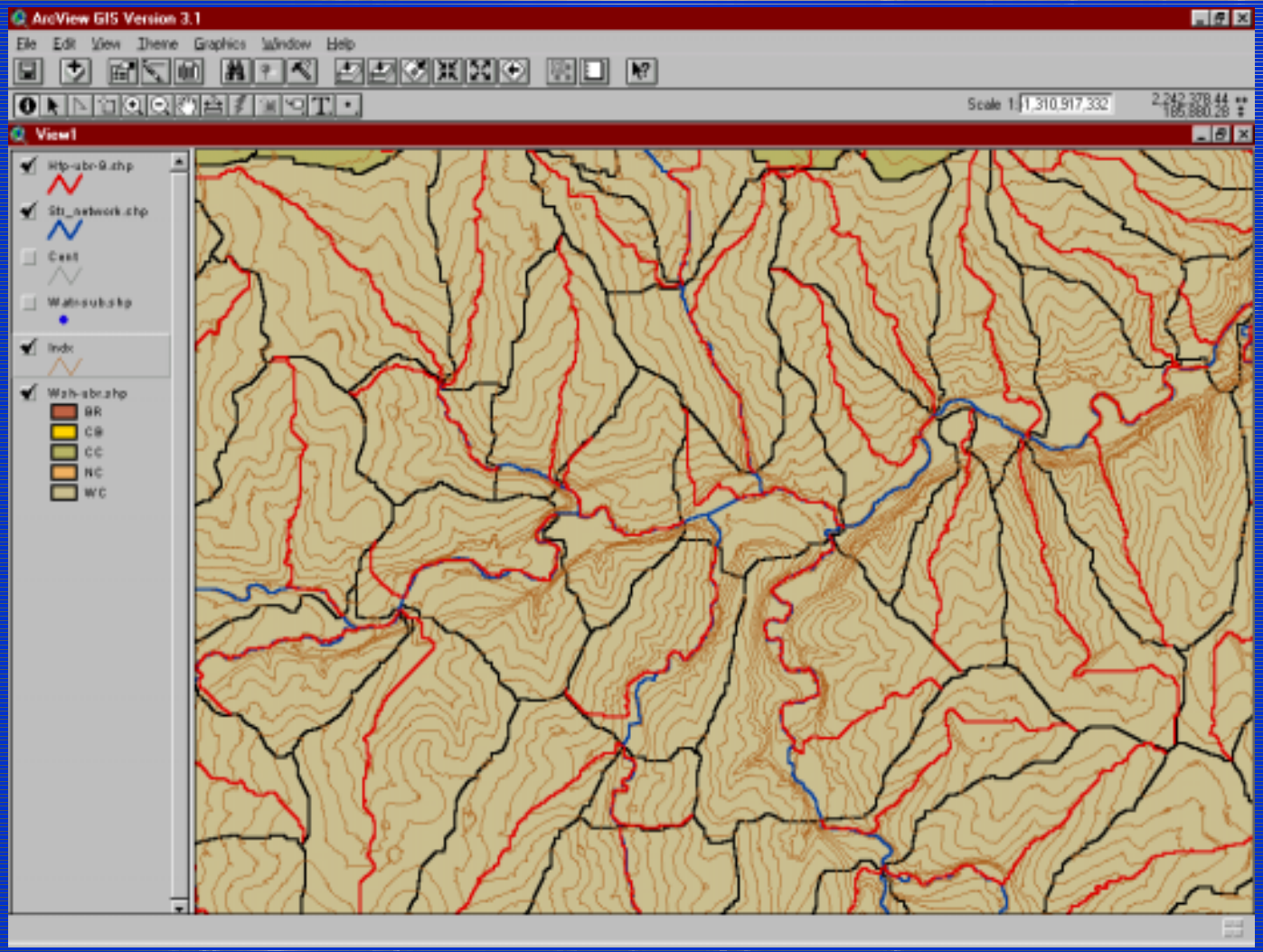
Overland Flow Paths



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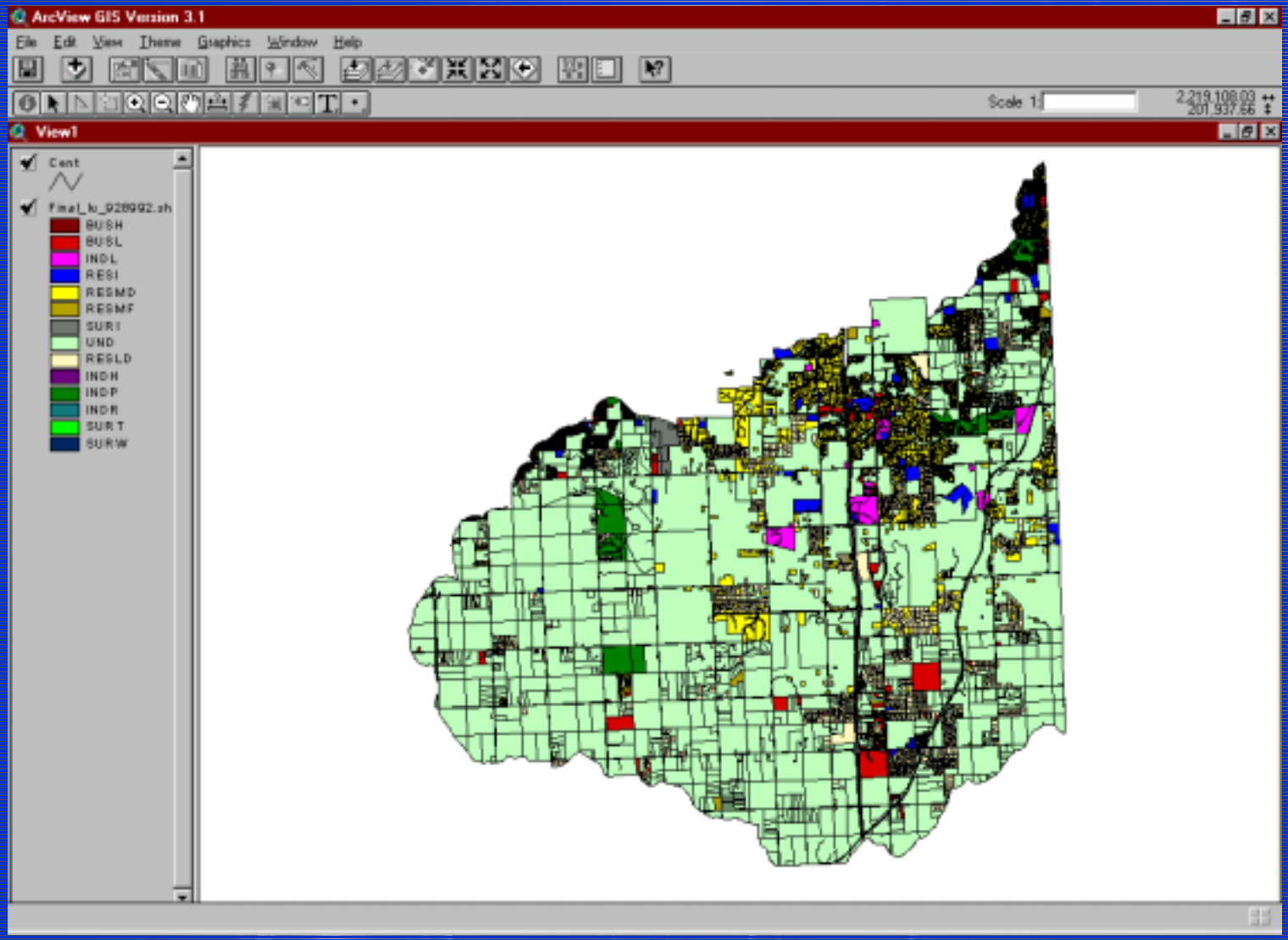
Landuse, Soils, etc.



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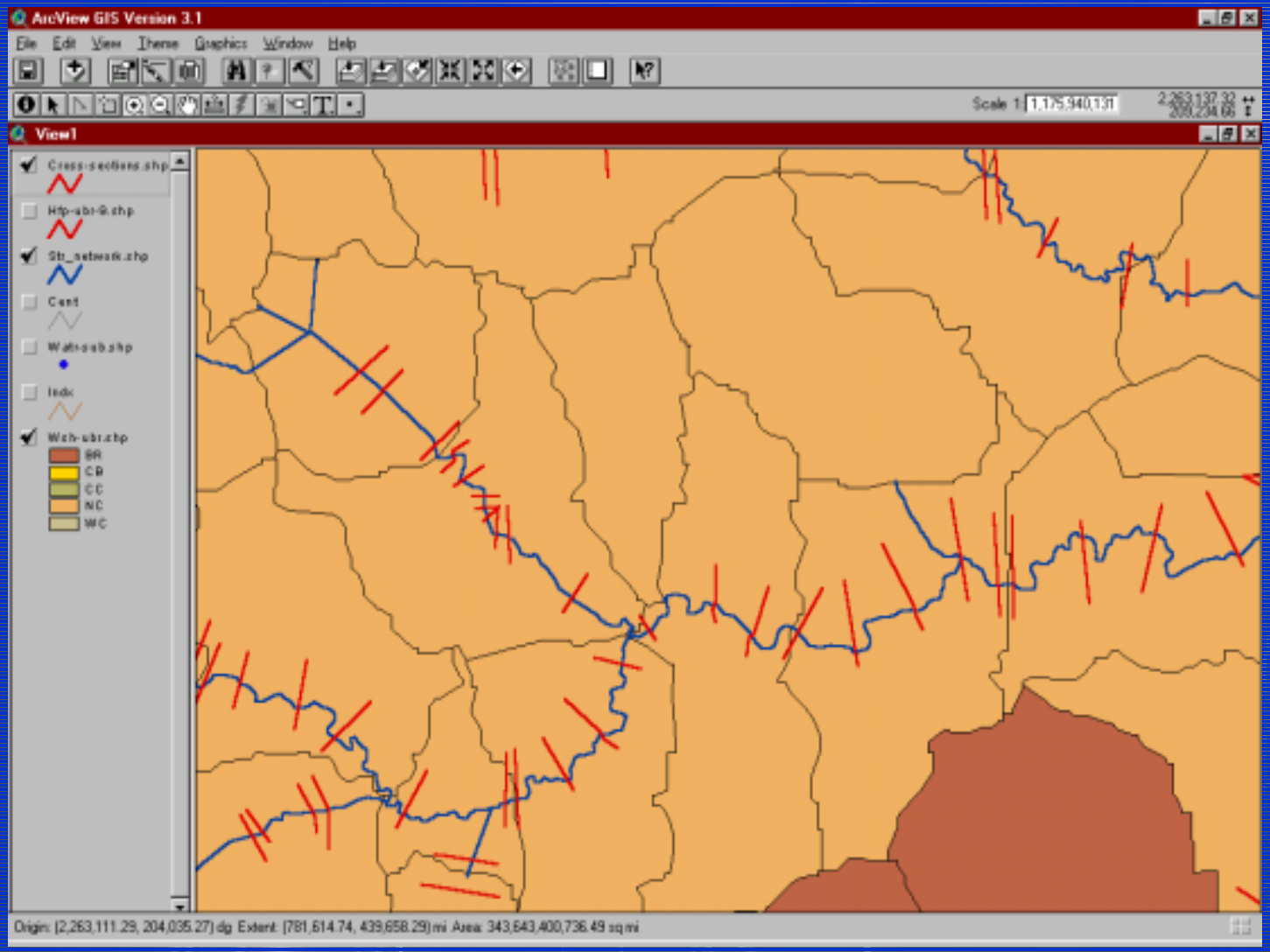
Cross-sections



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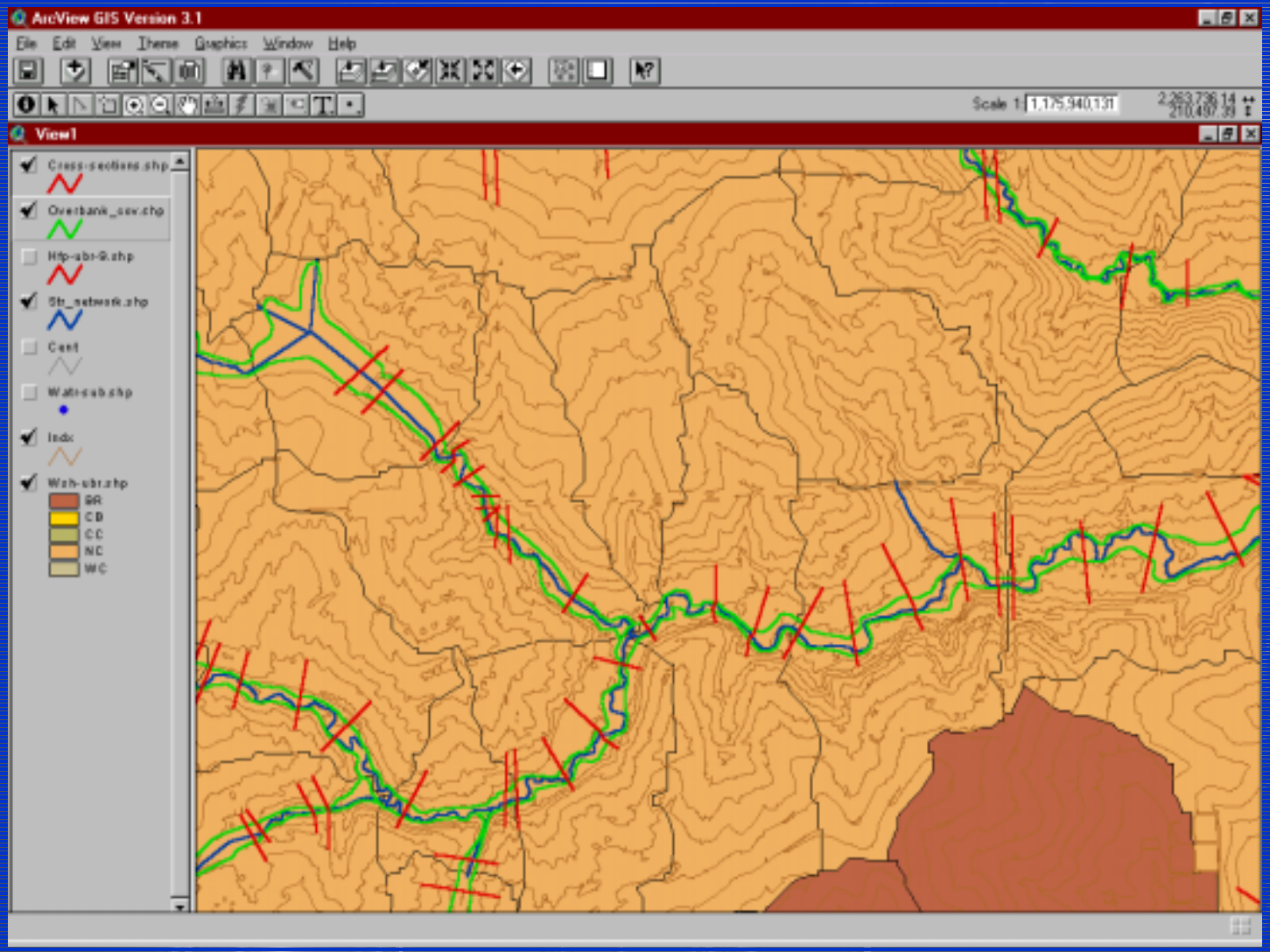
Cross-sections



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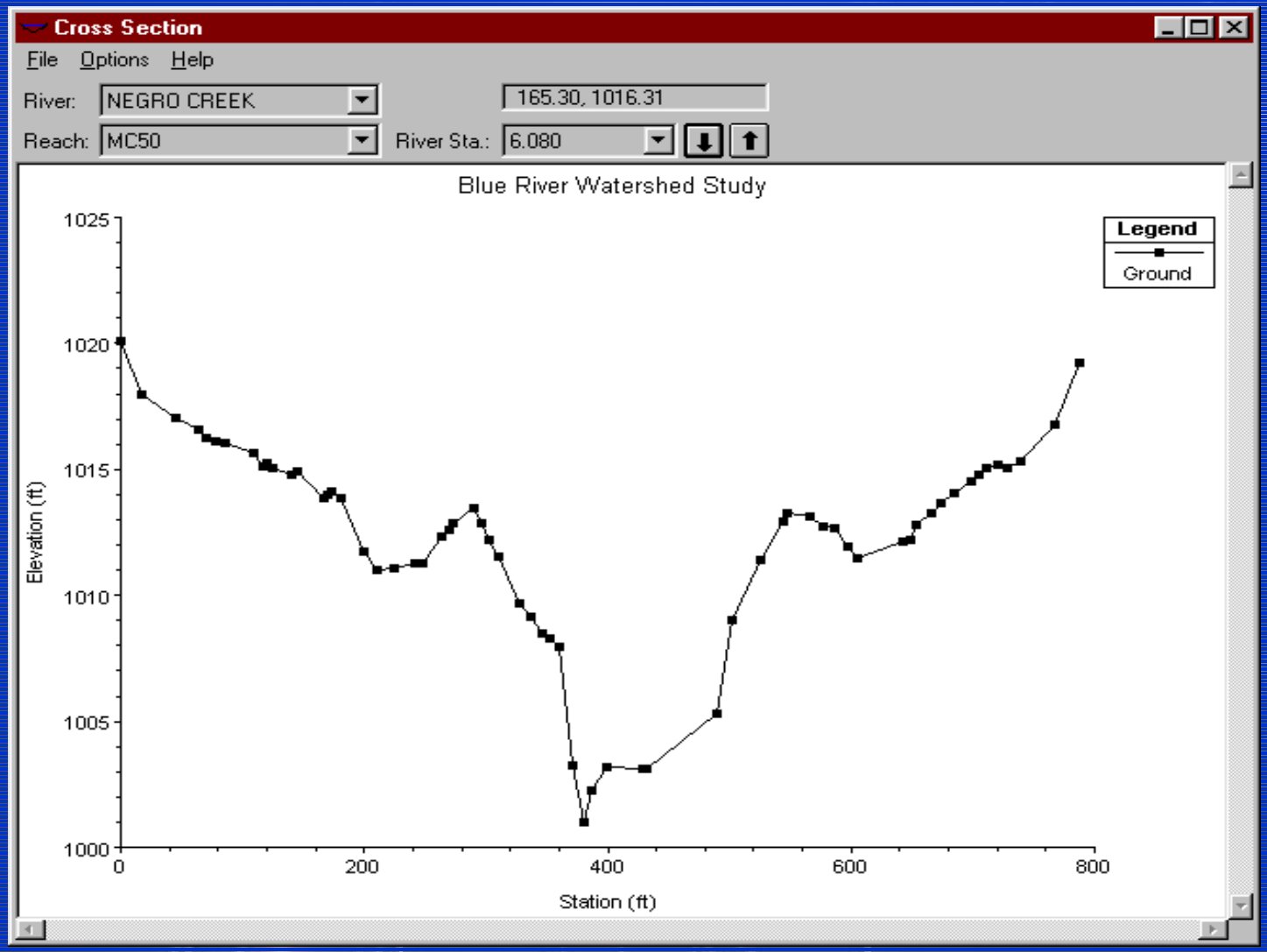
Cross-sections



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Next Steps

- Finalize Floodplain Mapping Routine / Documentation
- Comparison of Alternative Management Strategies
- Finalize documentation

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Quote of the project

"I didn't have to delineate one basin, planimeter one area, draw one overland flow path, measure one channel or manually cut one cross-section. I like GIS."

Key Success Factors

- Understanding of Needs
- Quality Data
- GIS promotes consistency in repetitive tasks
- Project Drives GIS Use
- Development of a Logical, Expandable Database Design
- Documentation of Procedures (repeatability)

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