

Building A GIS With the Metes & Bounds Survey System

Paper #1271

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August 12, 2004



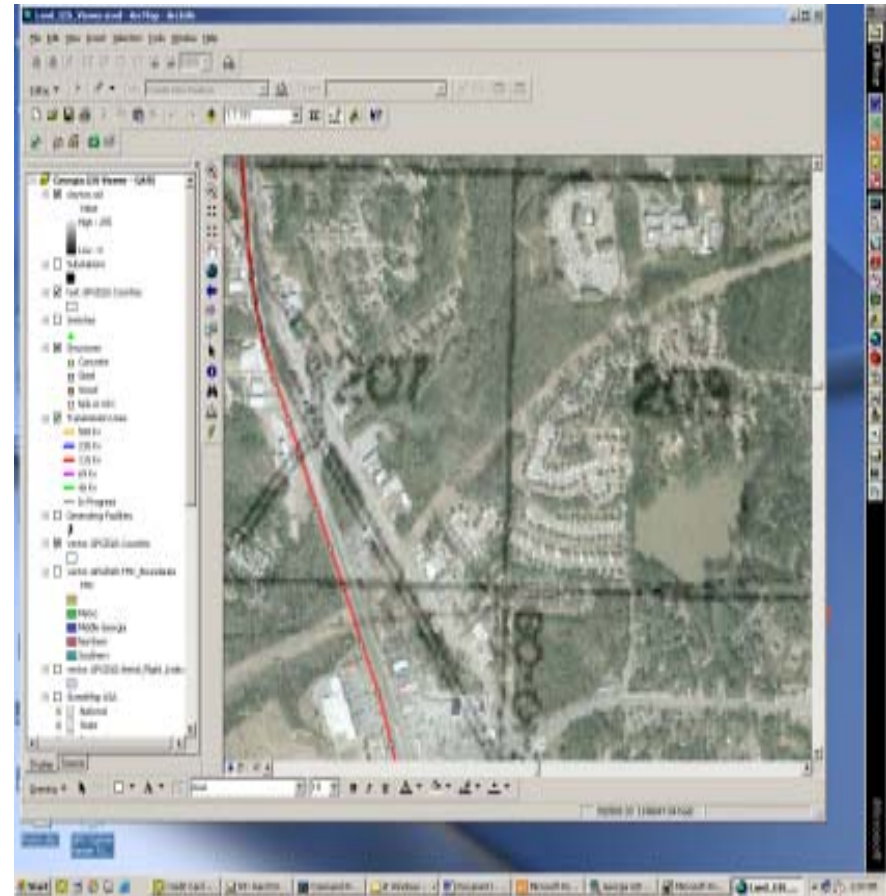
Introduction

- One of five regulated electric utility companies operating under the Southern Company umbrella
- **Moving forward** with ESRI site license and Enterprise GIS Strategy
- Georgia Power has approximately 2 million customers in nearly 159 counties
- GPC Land department manages assets on 12,000 miles of transmission, 42,000 miles of distribution, and 150,000 acres of land mostly near generating plants



Current State

- **Multiple non-spatial databases for land information that need to be linked to GIS. Focus on mining data we already have**
- **Currently providing user access tools by migrating from ArcView 3.3 to ArcView 8.3 and geodatabase**
- **Using Microsoft SQL Server with stand-alone feature classes. No models yet !**



Future State

- **Link geodatabase to non-spatial systems**
- **Create a landbase model for data, with special emphasis on survey and parcel data**
- **Design a more manageable system and workflow for capturing rights of way, easements, and encroachments into GIS**

Headrights System in Georgia 1732 -



- In general, 200 acres granted to head of household plus 50 acres for each family member (not to exceed 1,000 acres)
- Settlers would chose their surveyor, find vacant land, and then pick where to build after paying a title fee
- Fertile land was chosen first, which lead to problems with fraud, mistakes, etc.

Typical Headrights Grant



Composite map of headright grants in the fork of the Broad River, showing original grantees and dates of grants. A number of overlaps and gores are noted. The area was initially part of Wilkes County and today is in southeastern Madison County. From David H. Robertson and Susan T. Jenkins, *Original Land Grants, Deeds and Early History of Fork District, Madison County, Georgia* (1983).

Resembles a patchwork quilt

As population increased, many gaps between parcels surfaced

Situations often were worked out between neighbors, **which left no public record**

Most early records were destroyed during American Revolution

Why No Grid System Early On ?

Surveyor General's office convinced Georgia Legislature not to use a rectangular system:

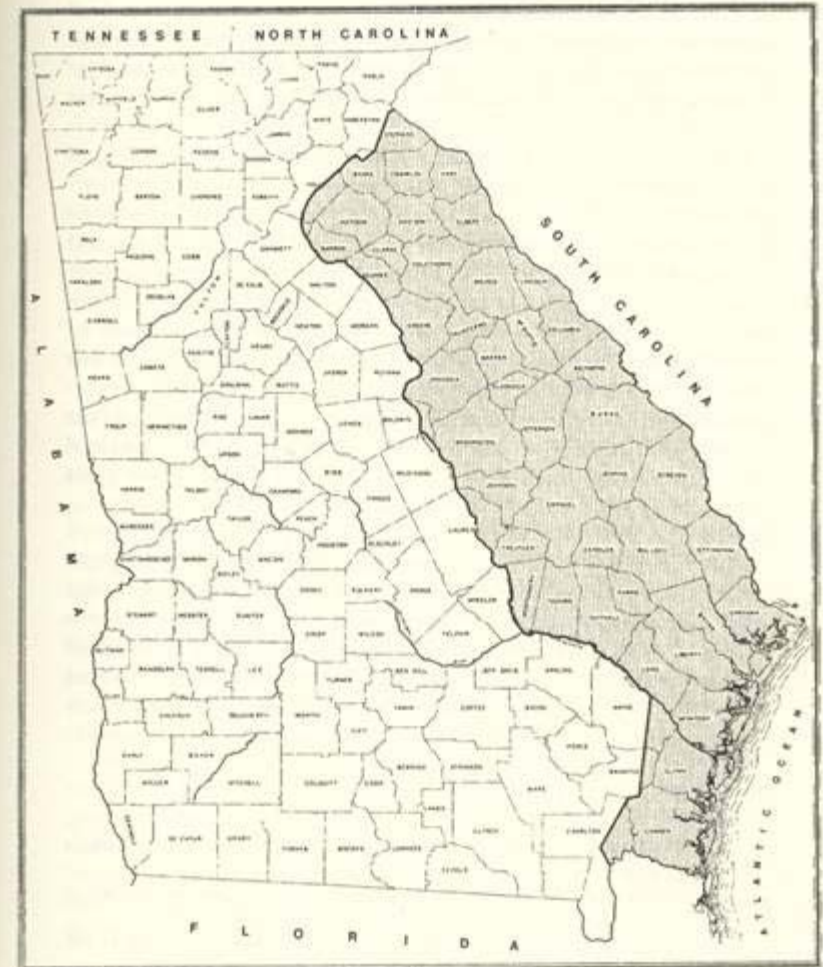
- 1. Enormous cost of an initial survey**
- 2. Lack of choice for settlers**
- 3. Estimated that 80% of Georgia was unsuitable for farming and would take many decades for people to claim**
- 4. Would interfere with boundaries of existing grants**

Effects of Headrights System

Affects about 12 million acres in about 40 counties

Legal descriptions use Georgia Militia Districts to describe property

Multiple boundary recovery surveys, disputes, and court cases



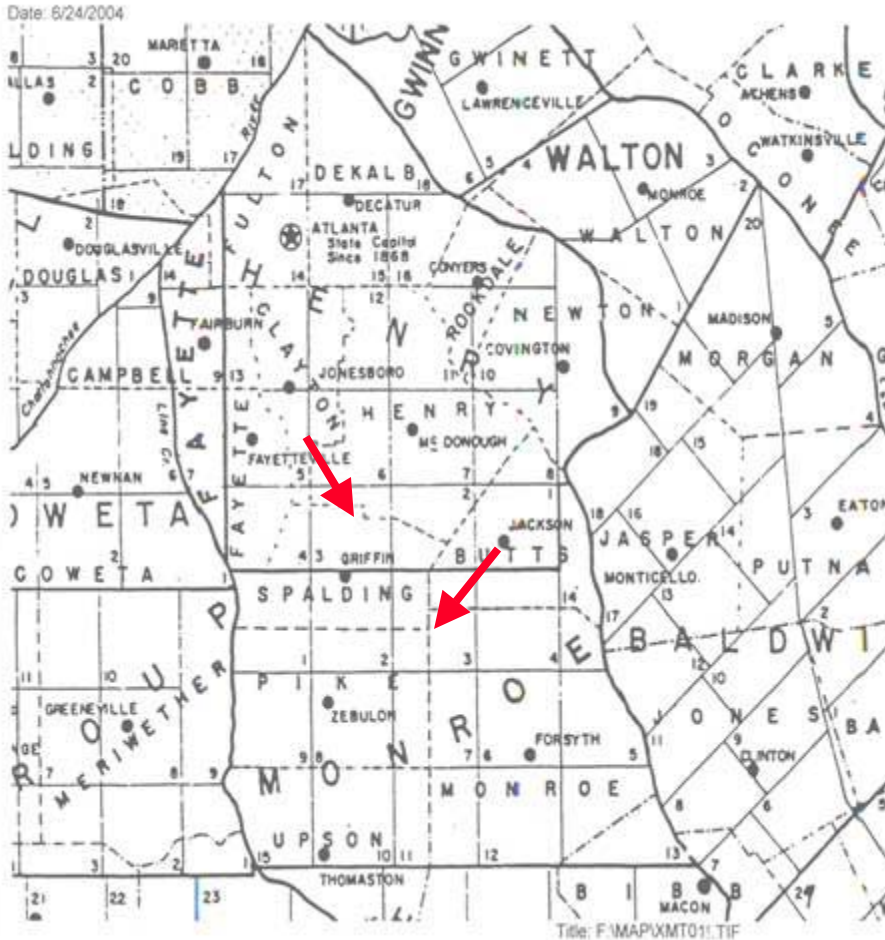
Lands distributed under the headright system.

Land Lottery System 1805 - 1833



- Ceded lands were surveyed and divided into districts and landlots on a grid system
- Surveys done at public expense and settlers drew tickets from two lottery wheels
- Allowed a more orderly distribution of land, reduced fraud, and gave everyone an equal opportunity

Example of Problems with Land Rights



Problem Today:

There are two areas where Land Lot 16 of the 3rd District of Spalding county exist. One for the original Henry county, and one for Monroe county.

Key Differences With Federal

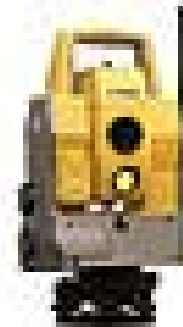
- **No large-scale baselines and meridians—each district and landlot laid out referencing county and district boundaries**
- **No statewide standard for numbering landlots until 1830**
- **Districts laid out at 13°, 45°, and 60° angles in some cases as opposed to cardinal directions**
- **“Standard” landlot sizes varied from 40 to 490 acres across the state**

Land Reserves System

- **Relatively small areas exempt from land lotteries and grants**
- **Reserved for Native Americans, building new cities and towns, and prominent individuals**

Managing Land Records Today

- Legal descriptions still rely on old systems, and often extensive research is needed to ascertain clear title
- Lack of complete historical records makes managing other types of land rights, such as easements, flood rights, mineral rights difficult
- Surveys in Georgia since the 1950's have been done with bearings and distances, but older deeds just make references to adjacent landowners and landmarks



Indexing Land Records With GIS

- **District grids, landlot grids and Georgia Militia District (GMD) boundaries are our spatial links**
- **Georeferencing and digitizing landlot boundaries based on best available information**
- **Managing expectations as to what the system can deliver**

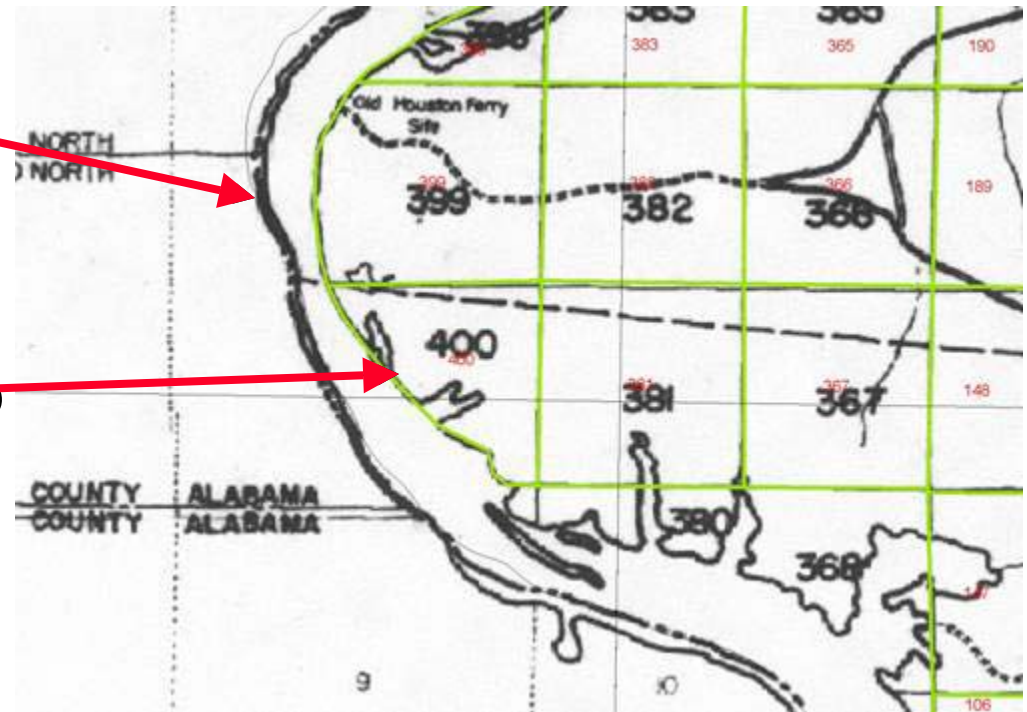
Indexing Land Records With GIS

Challenges

- **District and landlot numbers repeat and skip based on changes in county boundaries over the years**
- **Fractional landlots and natural boundaries**
- **Positional accuracies vary wildly**

Case Study – Harris County,

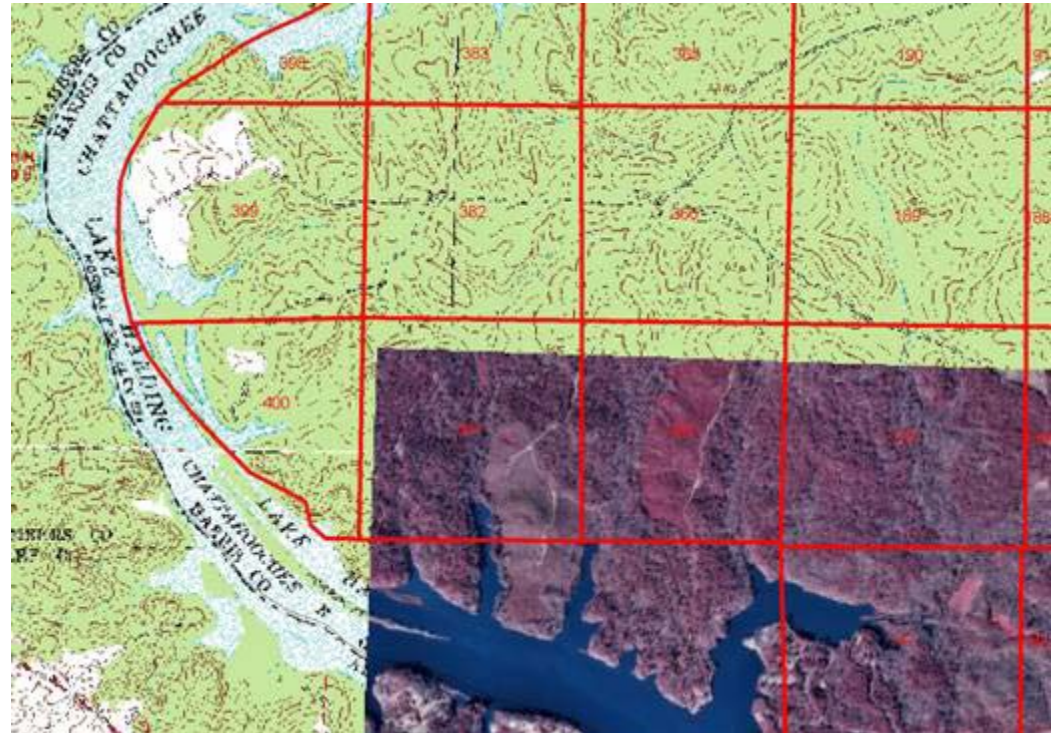
- The state line between Georgia and Alabama is the west bank of the Chattahoochee River
- The landlot lines stop at the eastern bank of the Chattahoochee



Case Study – Harris County,

The river course has changed over time

So how do we put a legal description on the islands in the middle of the river ?



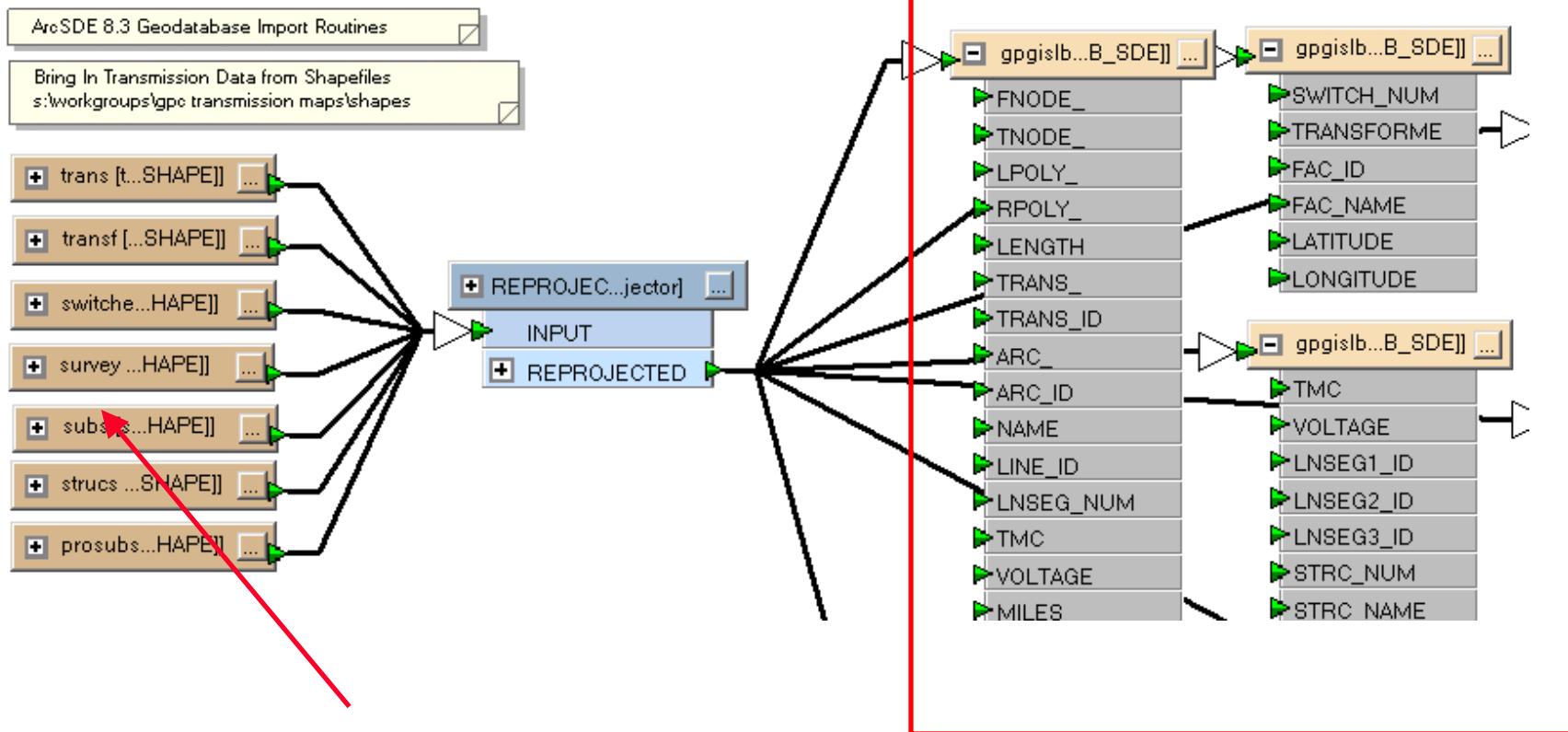
From the Deed

All that tract or parcel of land lying and being in the 20th District of Harris County, Georgia and being more particularly described, as follows: Fractional lots numbered Three Hundred Ninety-eight (398) Three Hundred Ninety-nine (399) , Four Hundred (400), and the South half of Lot Number Three Hundred Eighty-two (382), **and also the islands in the Chattahoochee River opposite said lots, and West of the North and South line forming the Eastern boundary of the above fractional lots Nos. 398, 399, and 400, extended until it crosses the Chattahoochee River going North, and North of the East and West line forming the Southern boundary of the said fractional Lot No. 400 extended until it crosses the Chattahoochee River**, including Hill Island, Buzzard Island, Potato Island, Picnic Island, and Fish Trap Island; all lying and being in the 20th District of originally Muscogee, now Harris County, Georgia.

Building The Geodatabase

- **Converting shapefiles into stand-alone feature classes**
- **Using FME to extract CAD data and to update geodatabase from various sources**
- **Building an aerial photography flight index and fee simple parcel layer**
- **Gathering data for information products, following Tomlinson's method in Planning a GIS**

FME Translations



Shape and CAD Files

Acknowledgement

Cadle, Farris W. Georgia Land Surveying History and Law, University of Georgia Press, Athens, Georgia 1991.

Discussion / Questions ?



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