

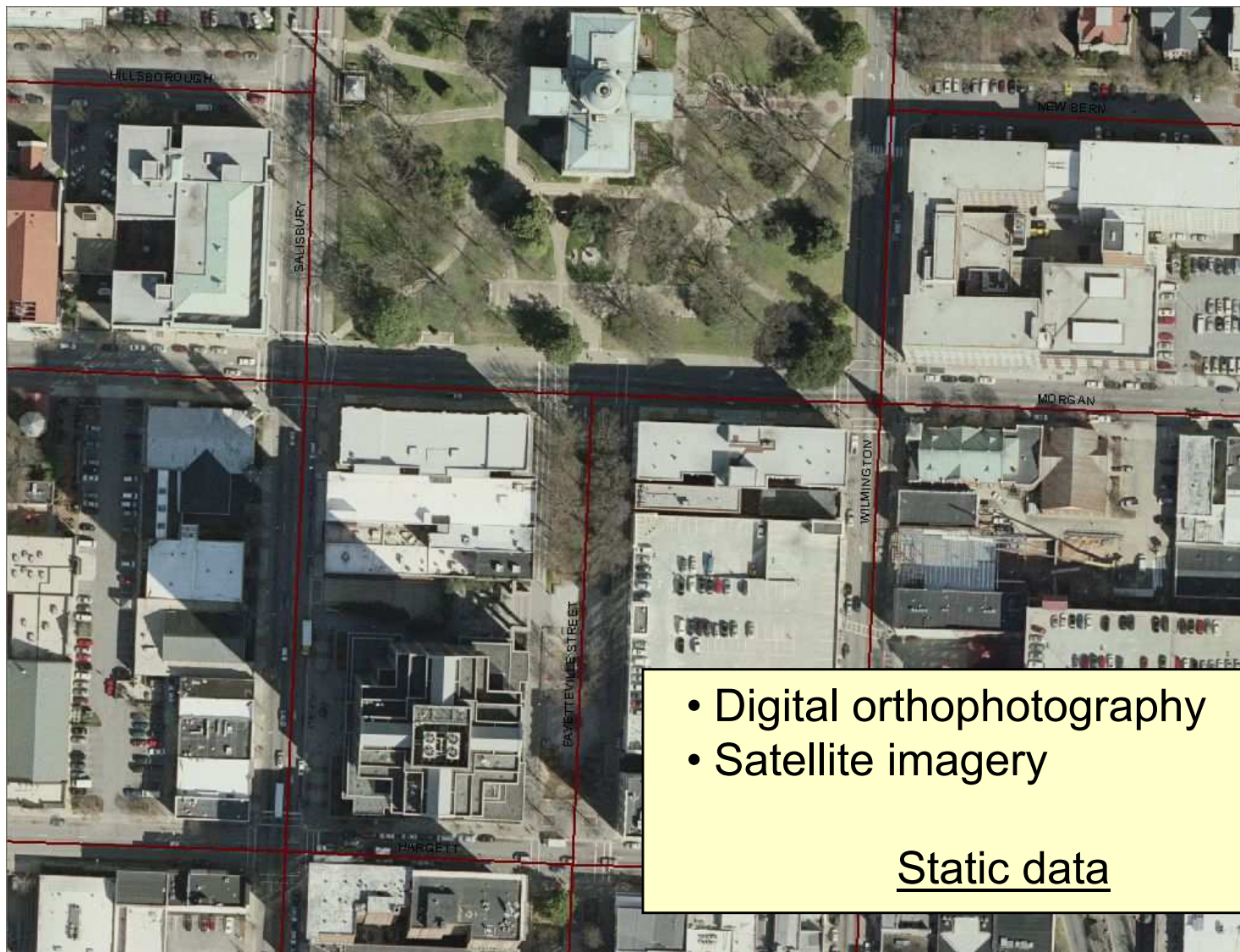


Preserving Geospatial Data: Challenges and Opportunities

Steve Morris
NCSU Libraries

***Indo-US Workshop on Trends
in Digital Preservation
March 24, 2009***

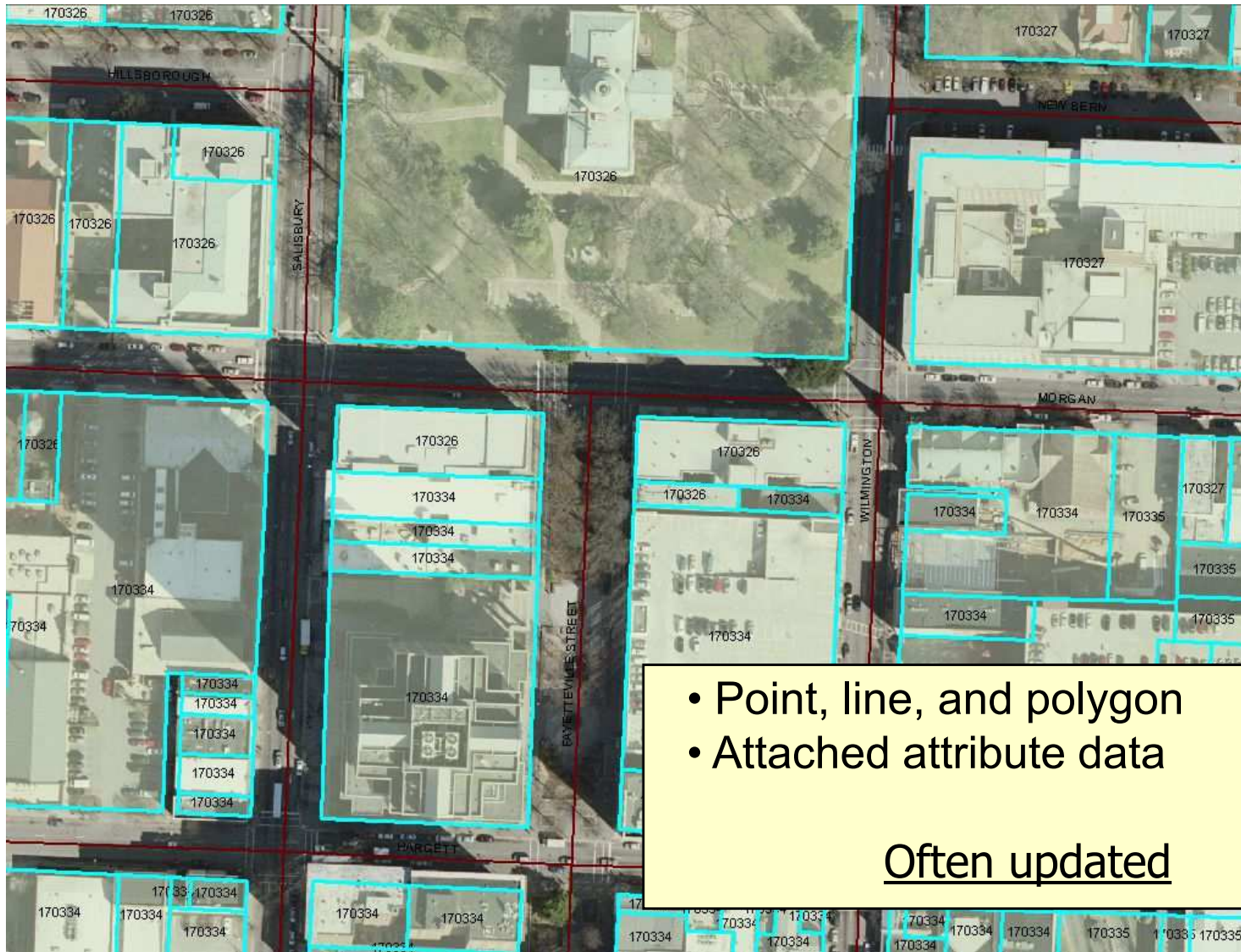
Geospatial Data Types – Raster



- Digital orthophotography
- Satellite imagery

Static data

Geospatial Data Types – Vector Data



Geospatial Data Types – Vector Data

- Transportation
- Utilities
- Environmental data
- Cultural resources
- Economic data
- Political boundaries
- Census
- *More ...*



Local data more detailed, current, and accurate than national data

Imagery = Durable

Static

Simple structure

Mostly open formats

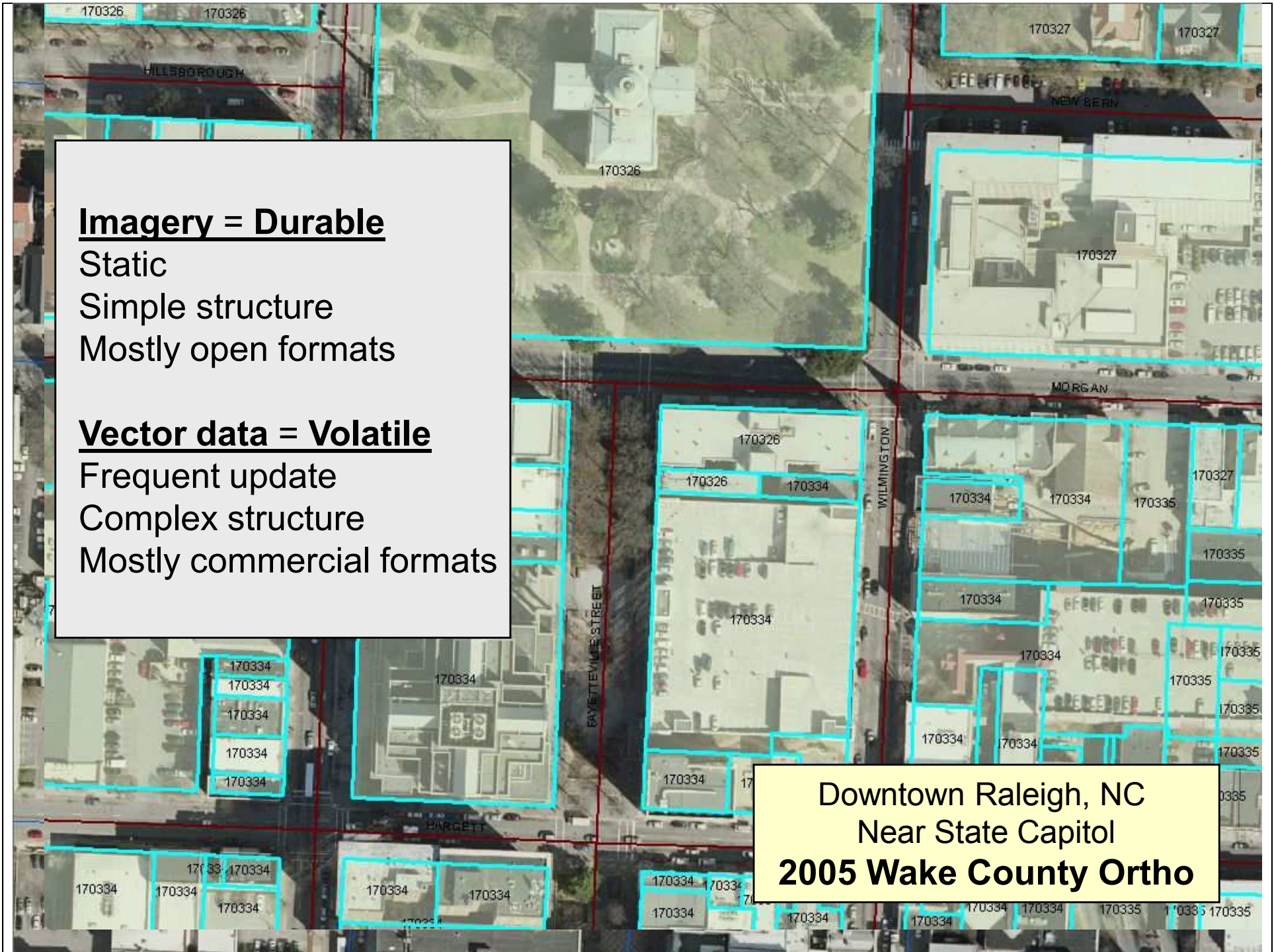
Vector data = Volatile

Frequent update

Complex structure

Mostly commercial formats

Downtown Raleigh, NC
Near State Capitol
2005 Wake County Ortho



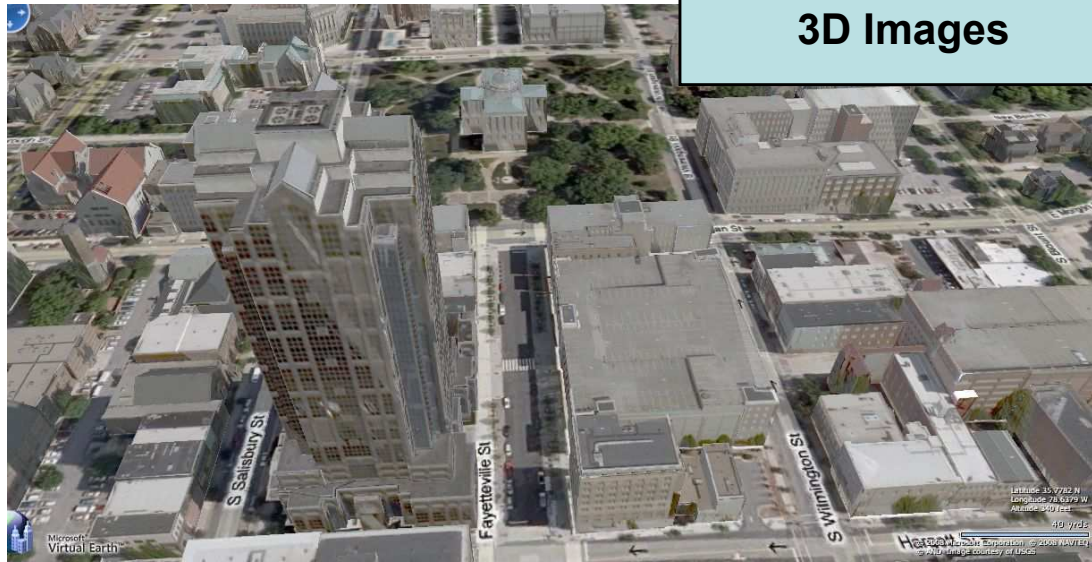
New Location-Based Content



Street Views



Oblique Imagery



3D Images

Present-day value in location-based services and mobile applications

Carrboro, NC : Population 17,797 (2005 est.)

Geographic Information Systems
Download Data

24 downloadable GIS data layers

Shapefiles can be imported into your favorite mapping program or viewed in ArcMap or a free viewer (ArcExplorer) that can be downloaded from ESRI at www.esri.com

- [Boundaries \(shapefile\)](#) Municipal and planning boundaries for Carrboro, municipal for Chapel Hill, and Orange County township boundaries.
- [Carrboro City Limits \(shapefile\)](#) Carrboro city limits.
- [Orange County Index Tiles \(shapefile\)](#) Orange County index tiles for the 1998 orthophotography.

Town of Carrboro

6 web mapping applications

4 OGC WMS services (web services)

Town of Carrboro ZONING Land Use Ordinance Section 15-142

9 downloadable PDF map layers

This map is a certified survey and no reliance may be placed on its accuracy. Source information used for this map may have been collected at different scales and times and using different techniques, resulting in inaccuracies among features represented together on the map. The Town of Carrboro assumes no liability for damages caused by inaccuracies in this map or supporting data and makes no warranty, expressed or implied, as to the accuracy of the information presented. The date of distribution does not constitute such a warranty.

Town of Carrboro Planning Department 301 W. Main St. Carrboro, NC 27510 919-918-7328 Jul 13, 2006

1:500 Feet 750 0

NC State Plane Coordinate System (NAD 83)



Geospatial Data: Compelling Issues

- Dynamic content
 - Constantly updated information
 - Data versioning
- Digital object complexity
 - Spatially-enabled databases
 - Complicated, multi-component formats
 - Proprietary formats

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Geospatial Data Preservation Challenges

■ Data capture

- Backups are common, but not long-term archives
- Producer focus on current data
- Shift to web services-based access

■ Inadequate or non-existent metadata

- Consistent NC survey statistics: Only 40% of data producers create and maintain metadata
- Existing metadata often needs to be normalized, synchronized with the data, and remediated

Loss of memory about the data is also a problem



NC Geospatial Data Archiving Project (NCGDAP)

- One of eight initial collection building projects in the Library of Congress NDIIPP (National Digital Information Infrastructure and Preservation Program)
- Lead organizations: North Carolina State University Libraries and North Carolina Center for Geographic Information & Analysis (NCCGIA)
- Focus:
 - State and local government geospatial data in NC
 - Repository development as catalyst for discussion
 - Goal: Engage spatial data infrastructure in data archiving
- Initial 3 year project extended to Dec. 2009



Spatial Data Infrastructure Role in Archiving

- Metadata standards and outreach
 - metadata quality, best practices
- Inventories
 - Reduce “contact fatigue”, shareable information store
- Content exchange networks
 - Leverage more compelling business reasons to put data in motion
 - Automate process, add technical & administrative metadata
- Framework data communities
 - Snapshot frequency, schemas, format strategies



Different Ways to Address Preservation

- Technical solutions: How do we preserve acquired content over the long term?
- Cultural/Organizational solutions: How do we make the data more preservable—and more prone to be preserved—from point of production?

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Current use and data sharing requirements – not archiving needs – are most likely to drive improved preservability of content and improvement of metadata

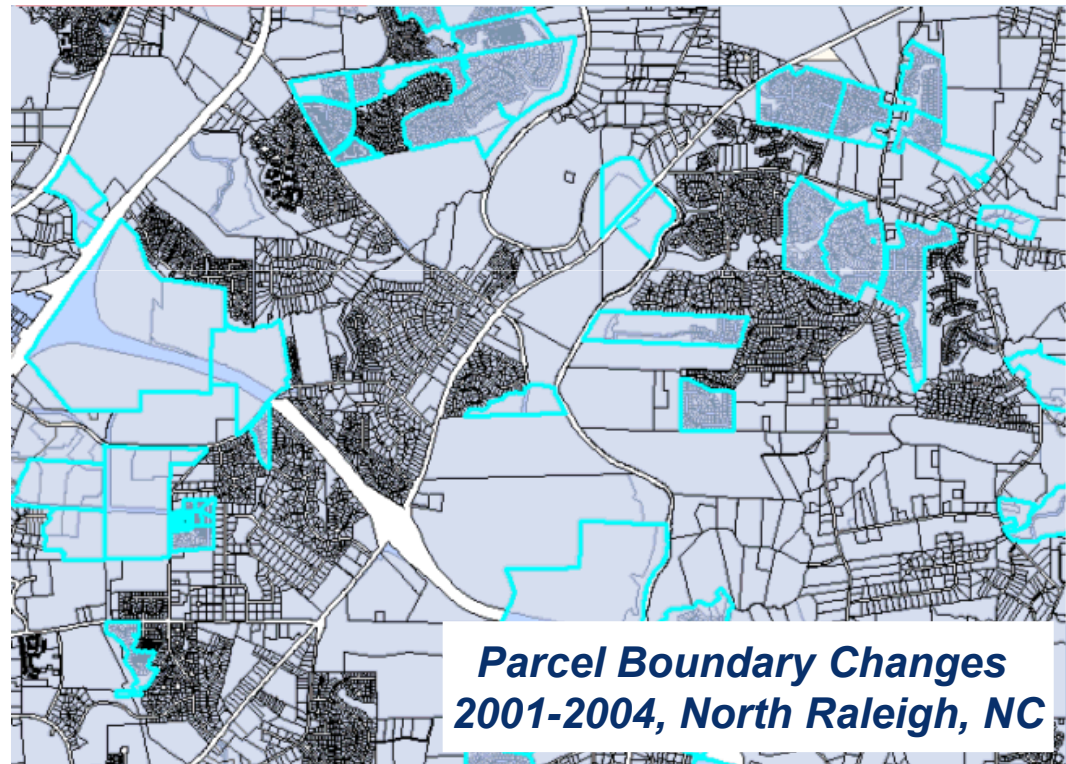
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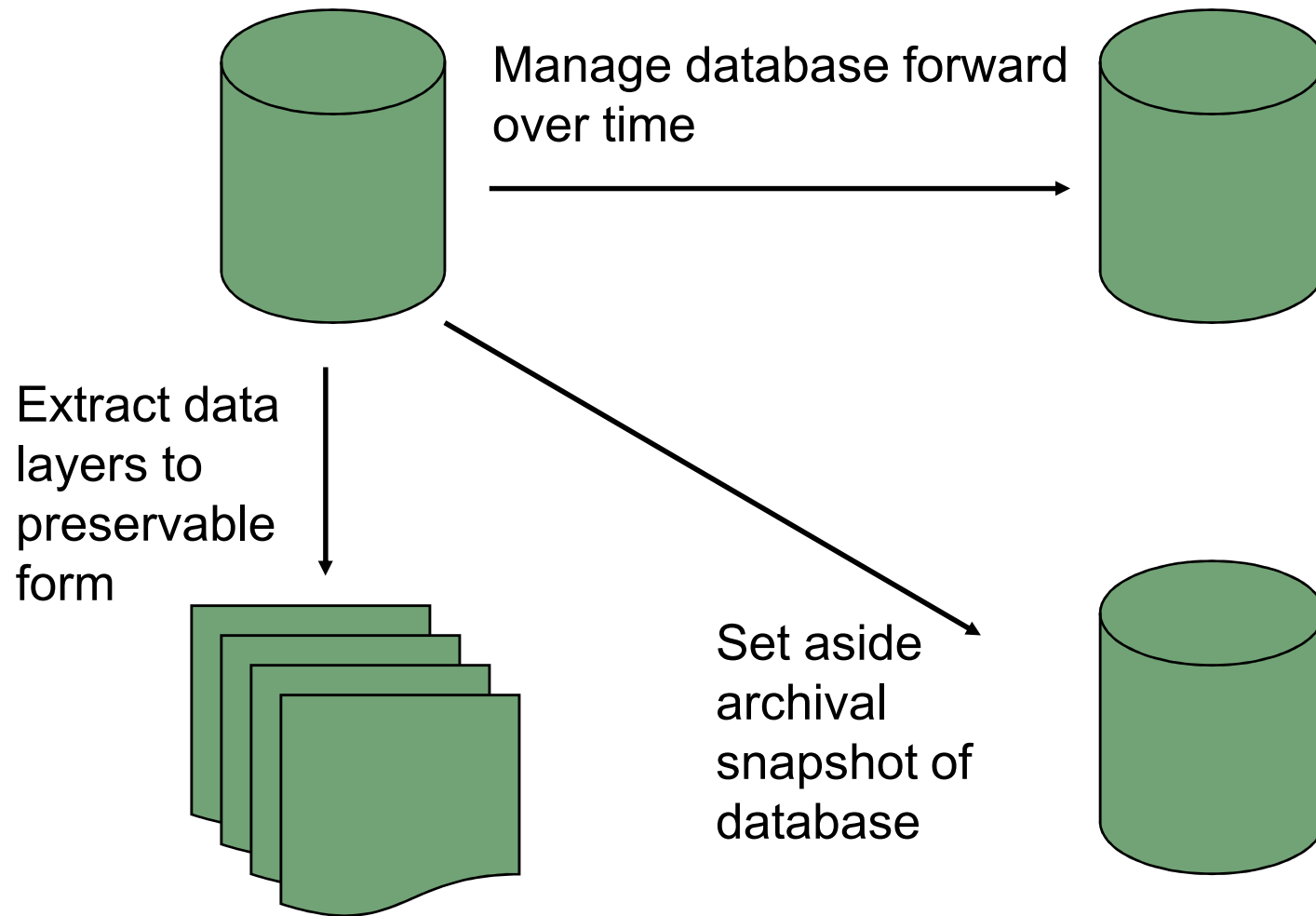
Preservation Approaches: Temporal Data Snapshots

Issue: How frequently should county and municipal vector data layers be captured in archives?

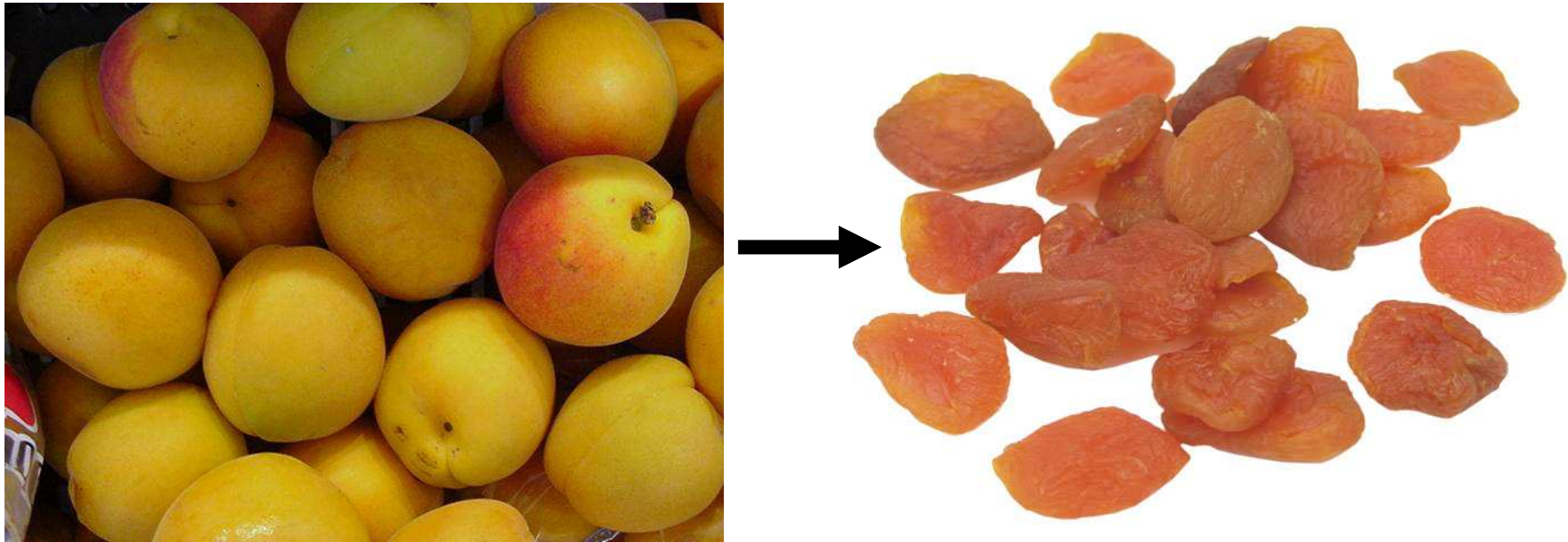
Parcels, centerlines, jurisdictions, zoning, ...



Preservation Approaches: Complex Spatial Databases



Preservation Approaches: Original Data vs. "Desiccated" Data



Complex data representations can be made more preservable (and less useful) through simplification

Preserving data representations (as well as data)

General Maps - Microsoft Internet Explorer provided by NCSU Libraries

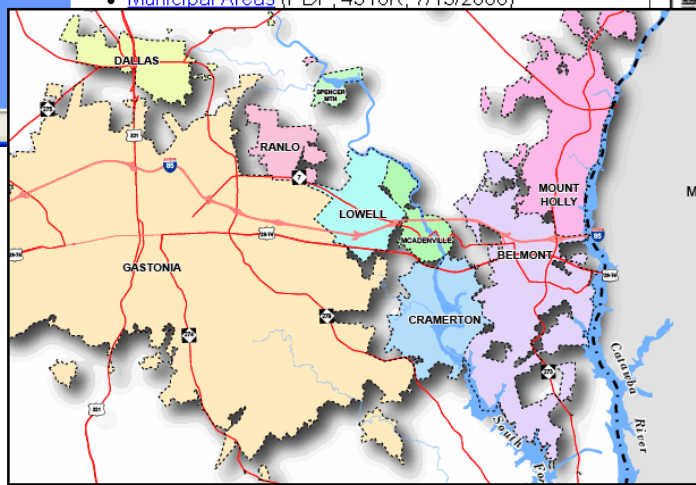
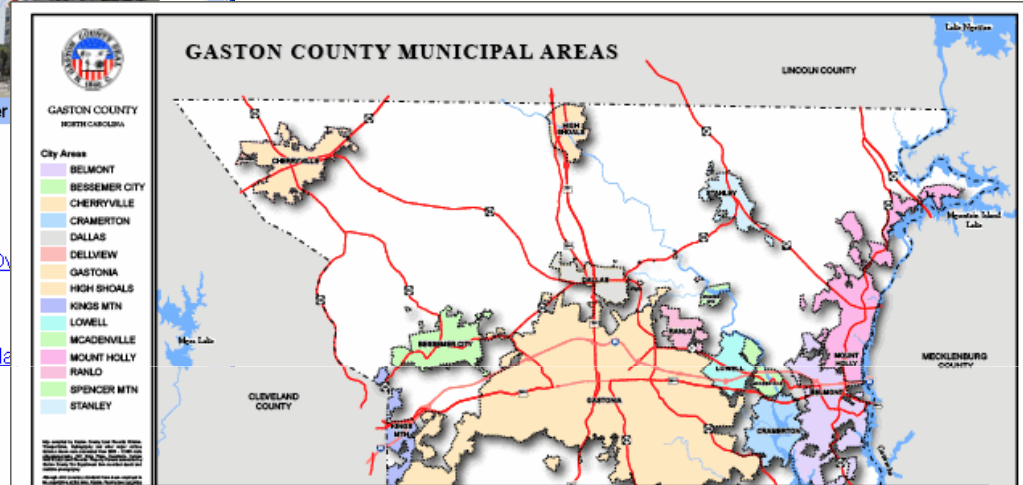
Address: <http://www.co.gaston.nc.us/Planning/maps/GeneralMaps.htm>

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Land Use
Long Range Planning
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Board of Adjustment
Planning Board
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Historic Preservation
Calendars
FAQ
Comp Plan
Census

Planning & Development Services
General Maps

- [Census Tracts](#) (PDF, 677K, 6/29/2006)
- [Census Tract Boundary with Election Precinct Districts Overlay](#) (PDF, 890K, 7/25/2006)
- [Communication Tower Sites](#) (PDF, 808K, 7/3/2006)
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- [Election Precinct Districts with Township Boundary Overlay](#) (PDF, 725/2006)
- [Extra-Territorial Jurisdictions](#) (PDF, 1463K, 7/10/2006)
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- [Municipal Areas](#) (PDF, 4316K, 7/13/2006)



Counterpart to analog map = datasets *plus* data models, symbolization, classification, annotation, etc.

More data intelligence survives in PDF documents than survives in most other “desiccated” formats



Project Learning Outcomes

- Preservation of GIS “projects” is needed to support re-creation of past work
- Preservation of data representations is needed to document decision-making processes
- Validation, remediation, and conversion of data and metadata is expensive: push for improvements upstream
- Some repositories handle “items”: can result in “atomization” of data
- For vendors, frame data preservation as a “customer problem”
- Must build the business case for preserving older data

Value in Older Data: Solving Business Problems

Land use change analysis

Site location analysis

Real estate trends analysis

Disaster response

Resolution of legal challenges

Impervious surface maps



Suburban Development 1993/2002

Near Mecklenburg County-Cabarrus County NC border



Project Action Outcomes

- State geospatial coordinating council recommendation:
“Establish archive and long term data access strategies”
- Archival and Long-Term Access Working Group formed by state coordinating council
- Multi-State NDIIPP geospatial project started in 2007
- Open Geospatial Consortium (OGC) Data Preservation Working Group started
- Engagement with software vendors (notably ESRI)



GeoMAPP: Geospatial Multistate Archival and Preservation Partnership

- Lead organizations: North Carolina Center for Geographic Information & Analysis (NCCGIA), State Archives of NC, with Library of Congress
- Partners:
 - State geospatial organizations of Kentucky and Utah
 - State Archives of Kentucky and Utah
 - NCSU Libraries in catalytic/advisory role
- State-to-state and geo-to-Archives collaboration
- 2 year project: Nov. 2007-Dec. 2009
- Archives as part of Spatial Data Infrastructure

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GeoMAPP: Project Components

- Introduce GIS organizations and State Archives to each other
- Archival selection and appraisal processes
- Retention schedule development
- Data transfer to archives
- Development of enhanced business case
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Thank You!

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NCGDAP:

<http://www.lib.ncsu.edu/ncgdap>

GeoMAPP

<http://www.geomapp.com>

