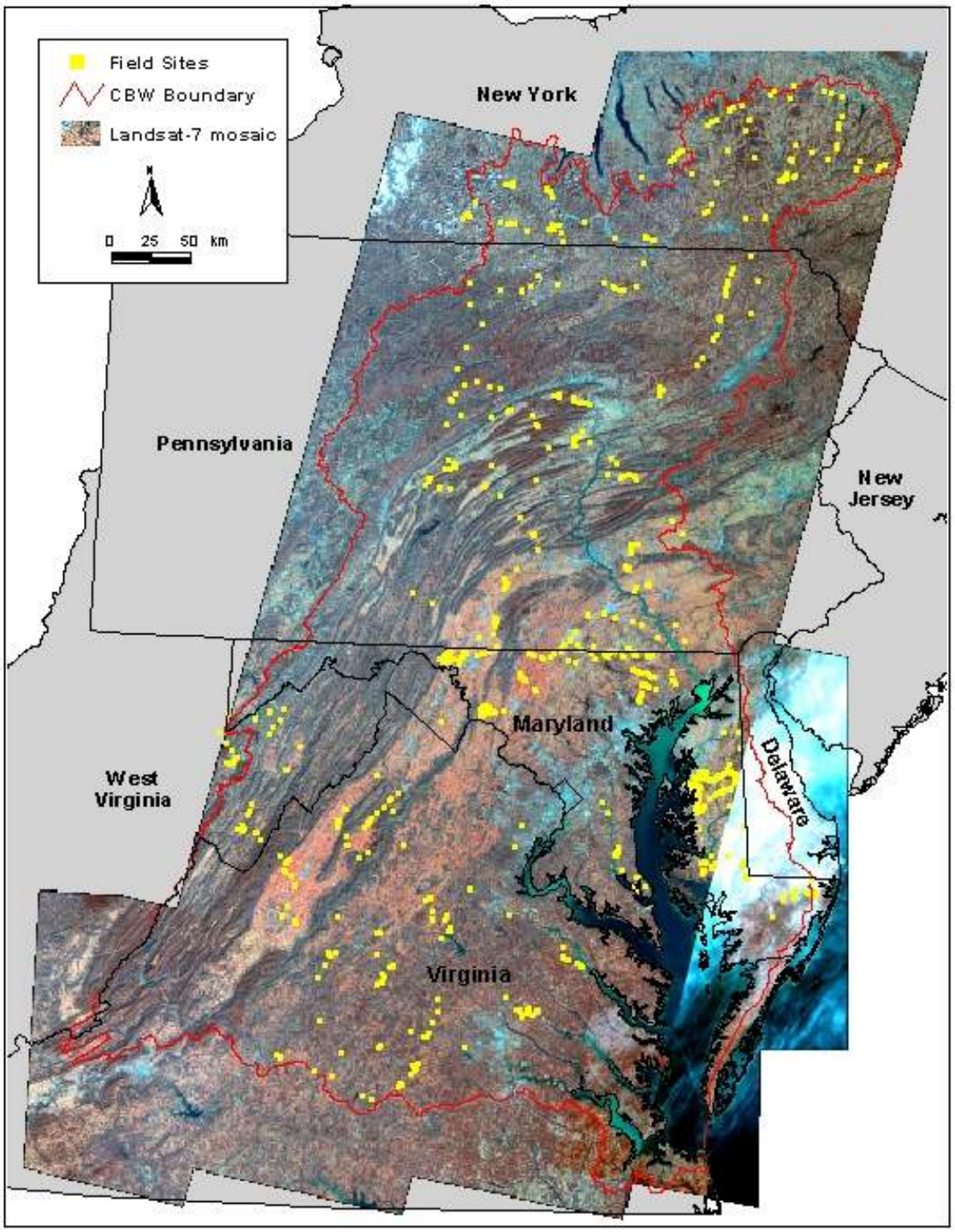
Overview

- One of 7 NASA RESACs nationwide
  - Centered at University of Maryland, College Park
  - Director, Manager, Liason, 1 Res. Scientist*
  - 4 Full-time Res. Assts, 8-10 Grad Students
- 40+ Partner organizations
- Study Area
  - Chesapeake Bay Watershed / Federal Region 3

The Mid Atlantic Regional Earth Science Applications Center (RESAC)
University of Maryland, Geography Department
www.geog.umd.edu/resac Tel 301 405 3408

Objective: Improved Land Cover & Use Mapping, Monitoring and Modeling

- Current land cover / use
- Past land use change
- Modeling: Land use change, Chemical transport, NPP
- Demo Projects: Landscape Features and Properties
  - Crop cover, condition, productivity
  - Impervious surfaces
  - Forest cover & fragmentation
  - Riparian buffers
  - Wetlands



Chesapeake Bay Watershed Landsat7 Mosaic for Land Cover Classification

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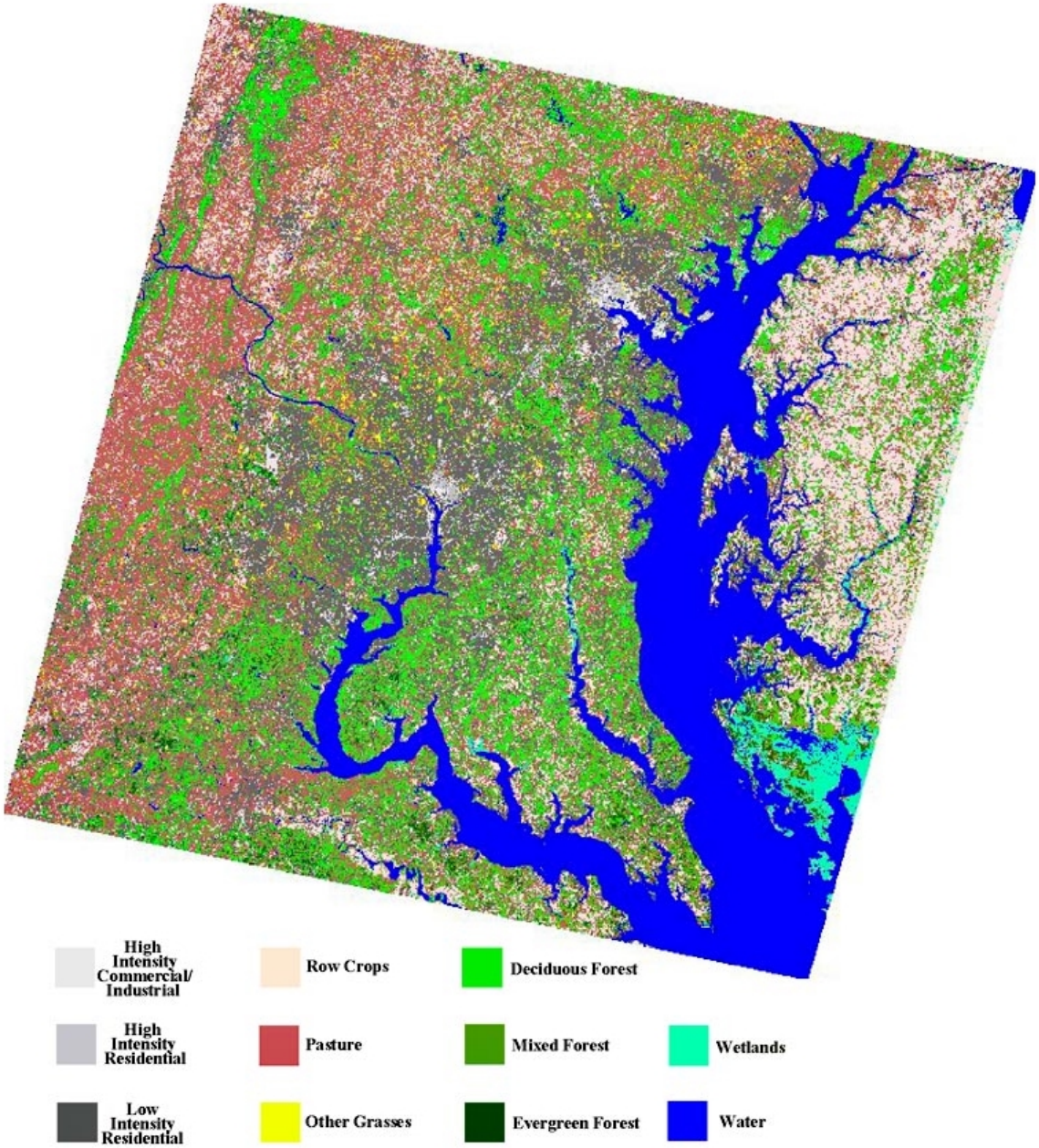
Land Cover Classification of path 15 row 33



Improved Discrimination of land cover types:

-crops, grasslands & pasture

- residential densities

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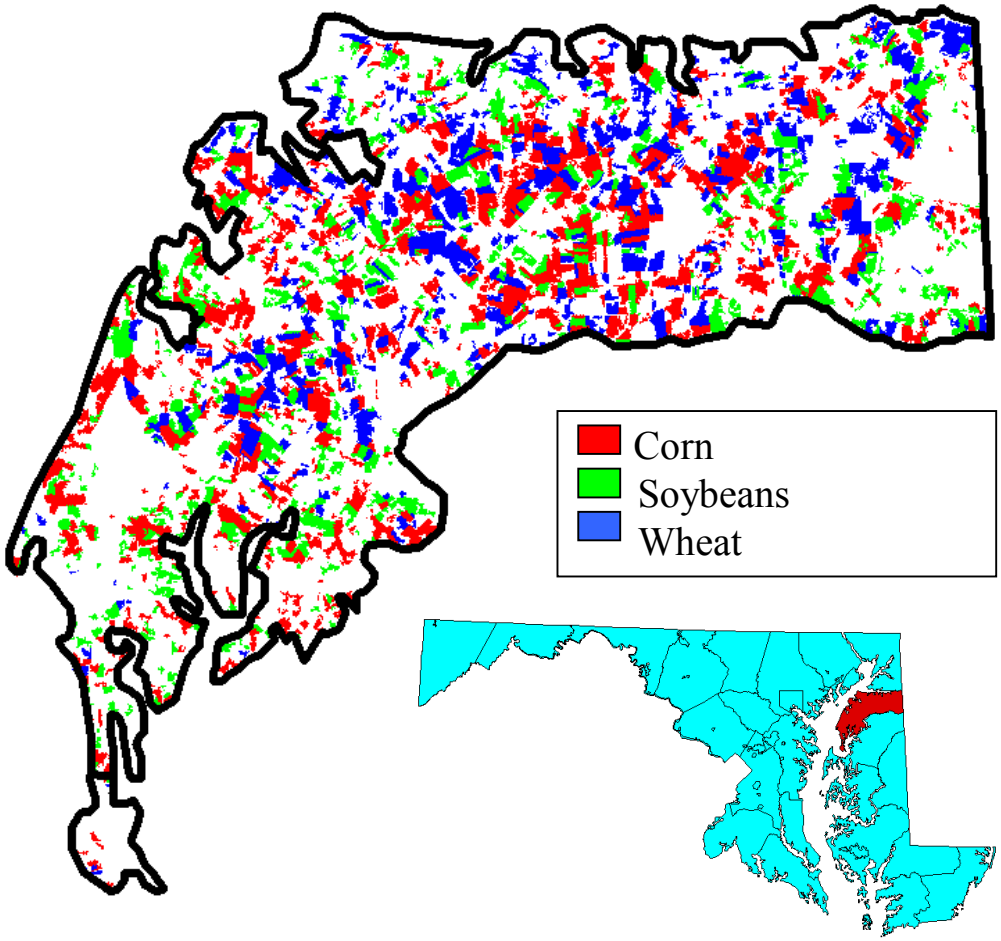
Crop Mapping with Multi-Temporal Landsat Imagery



Kent County, Maryland 1998	Corn	Soybeans	Wheat
Acres from Satellite Map	35,468	37,218	20,730
Acres from Crop Statistics (NASS)	35,500	35,400	19,900

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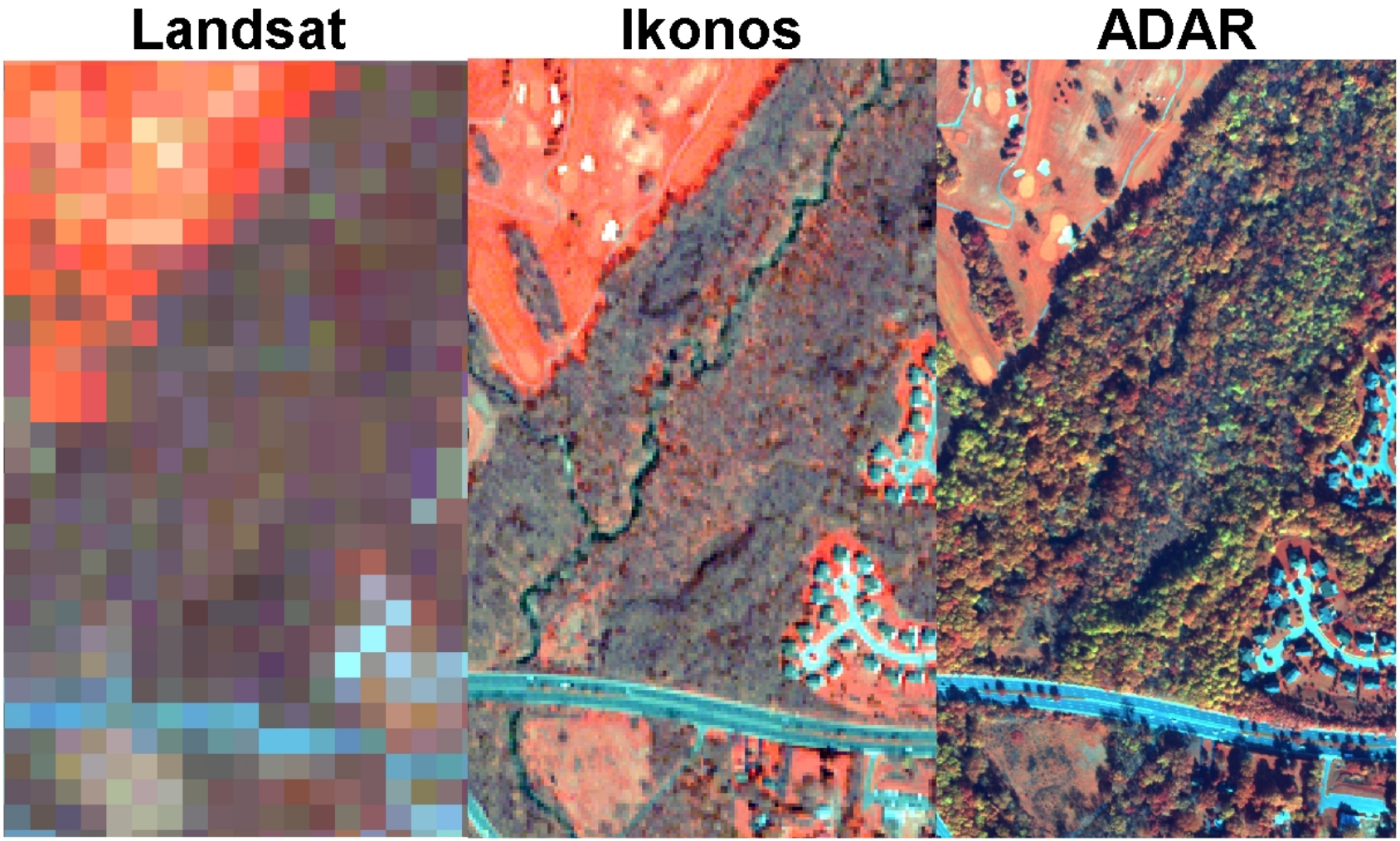
Multiple Sensors/Resolution



IKONOS & ADAR acquired through NASA SDP

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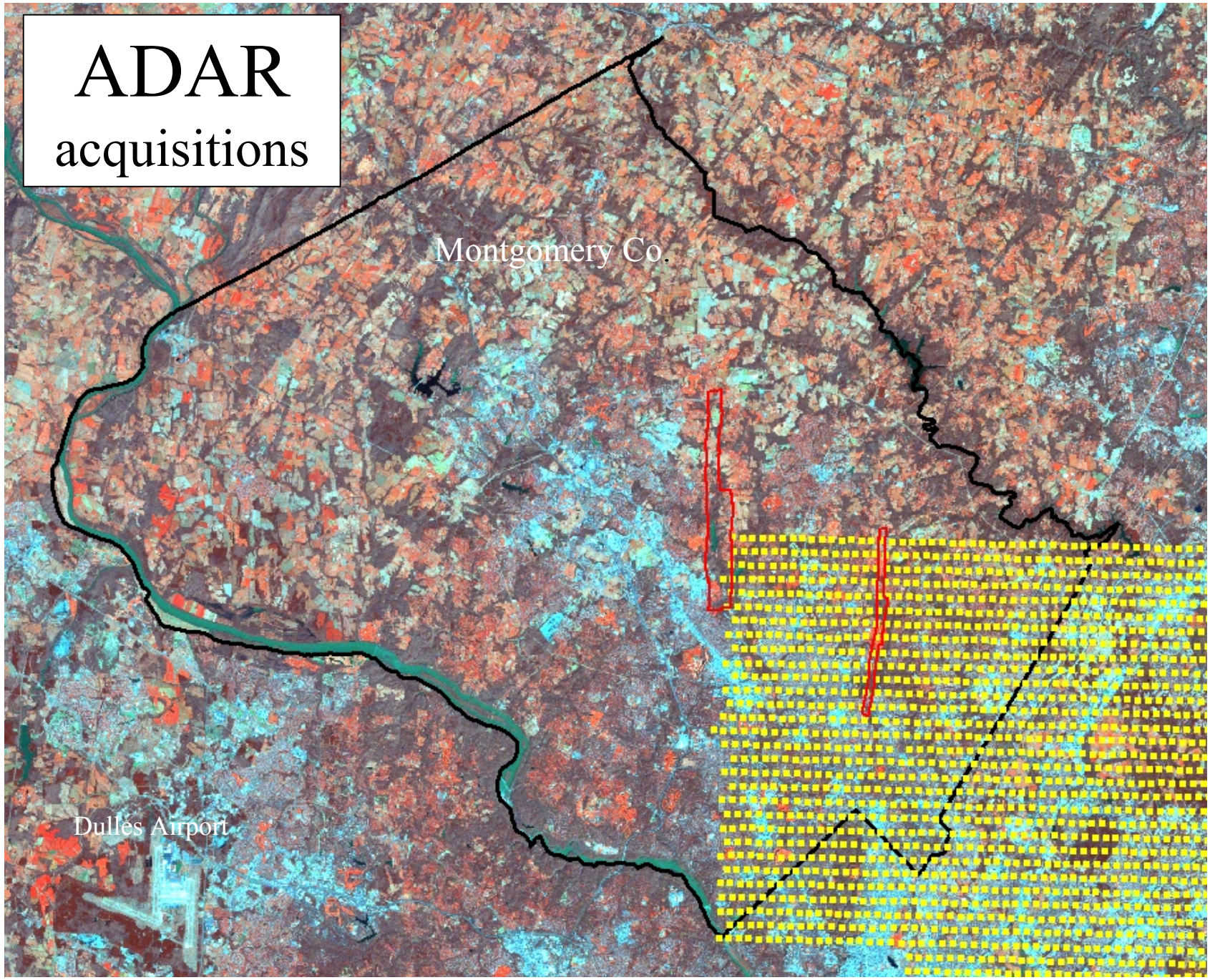
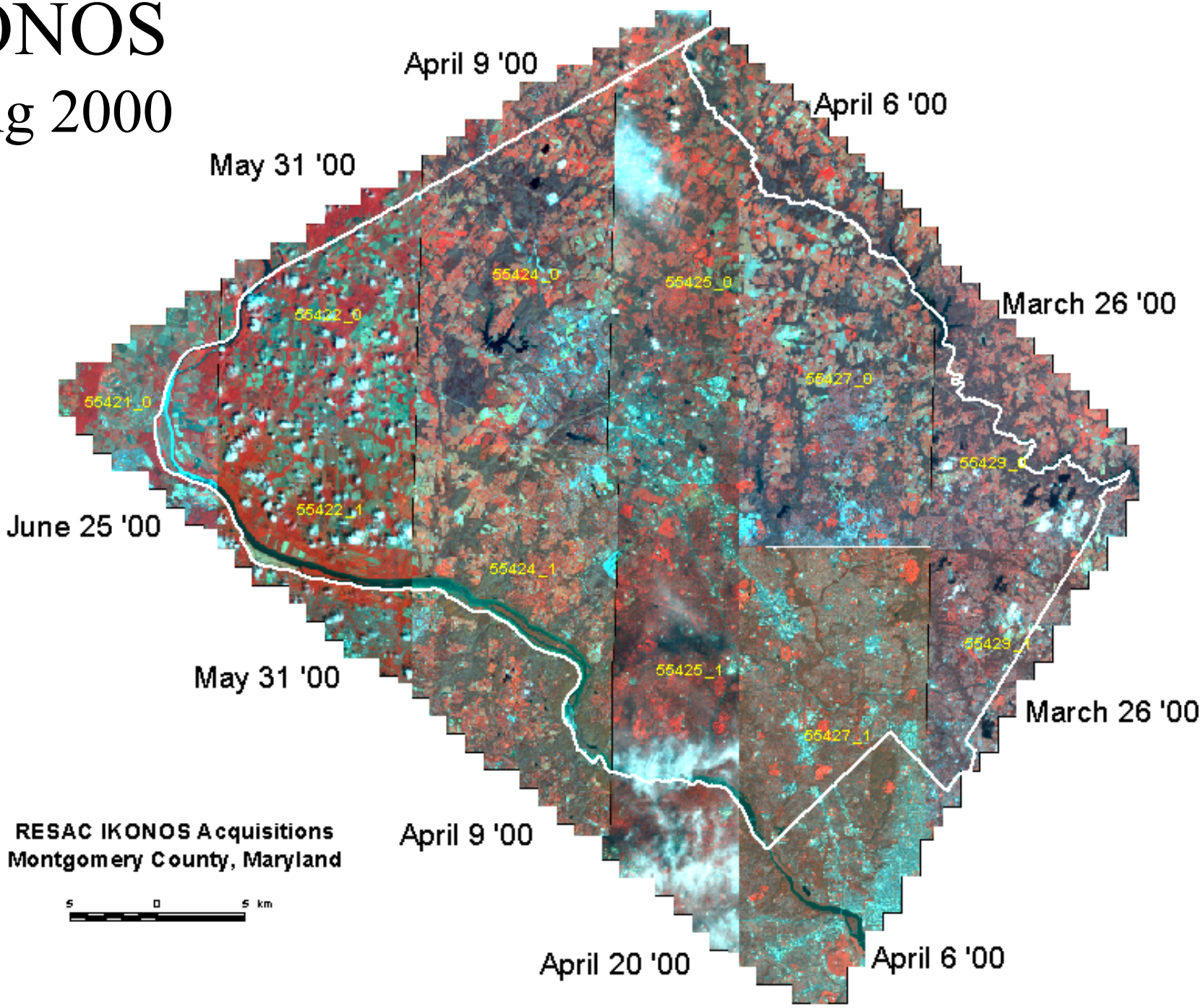
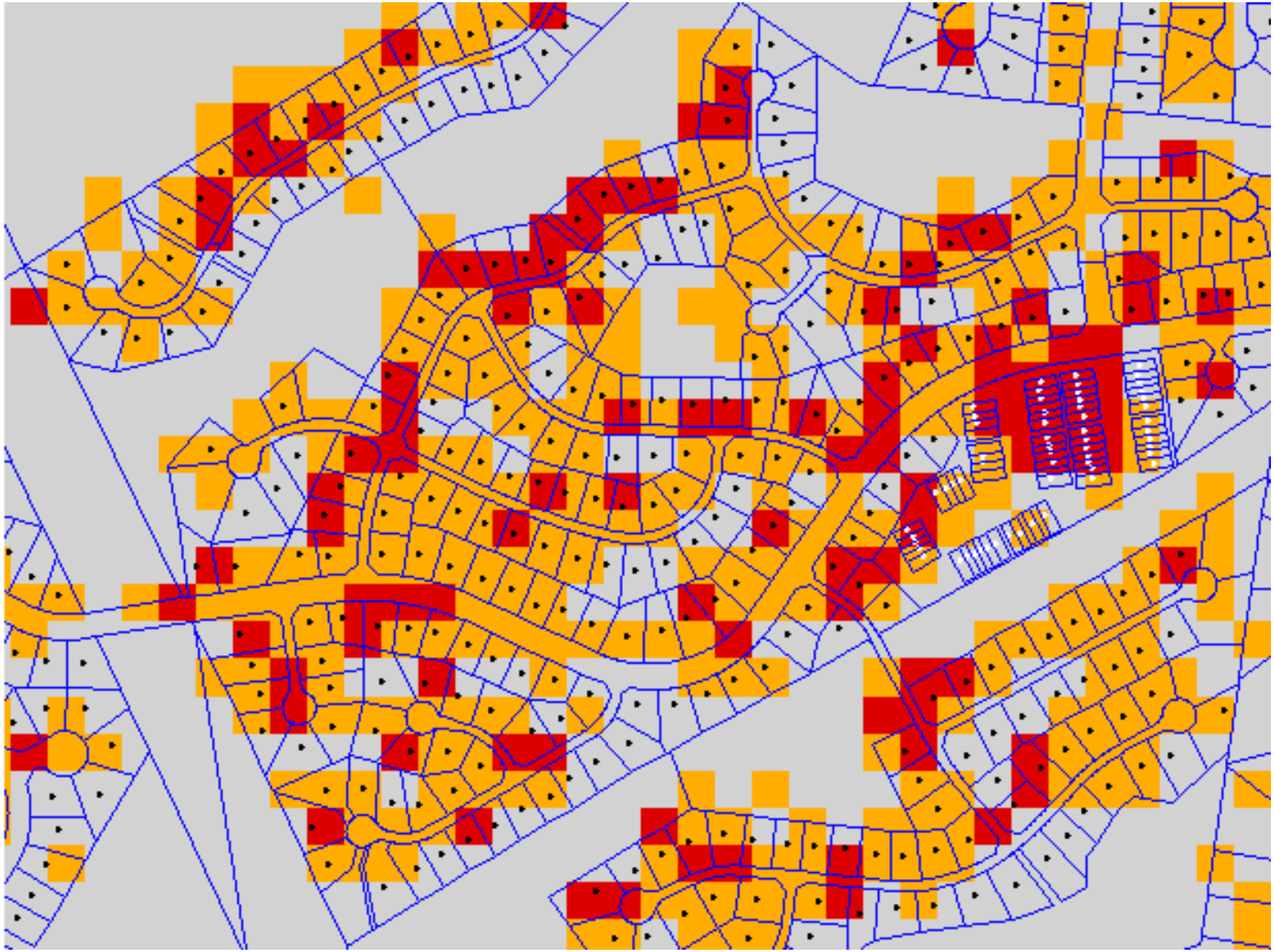

ADAR
acquisitions
Montgomery Co.
Dulles Airport

IKONOS
Spring 2000

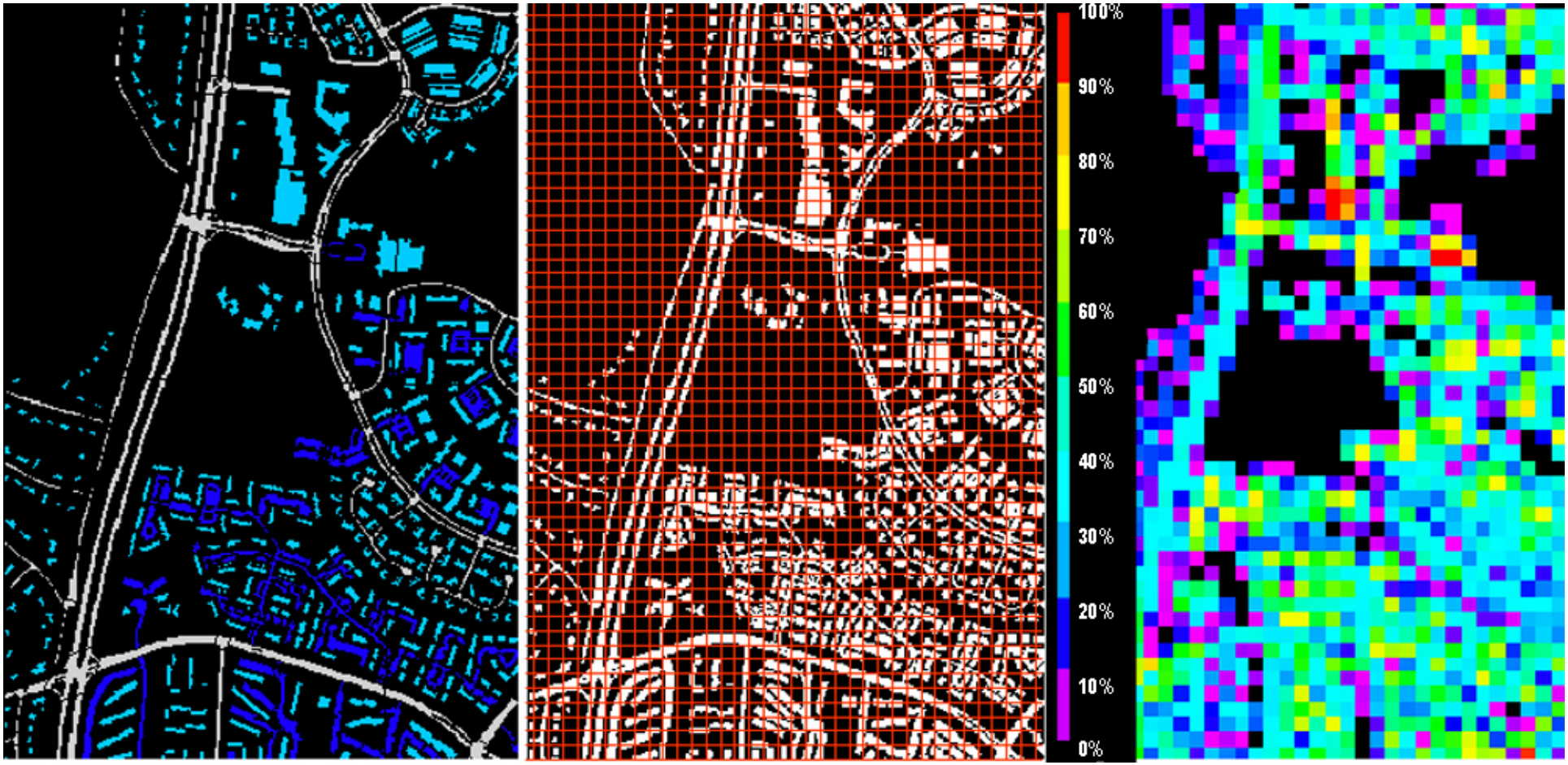


IKONOS, Property View & Parcel Data

Landsat Residential Density Mapping

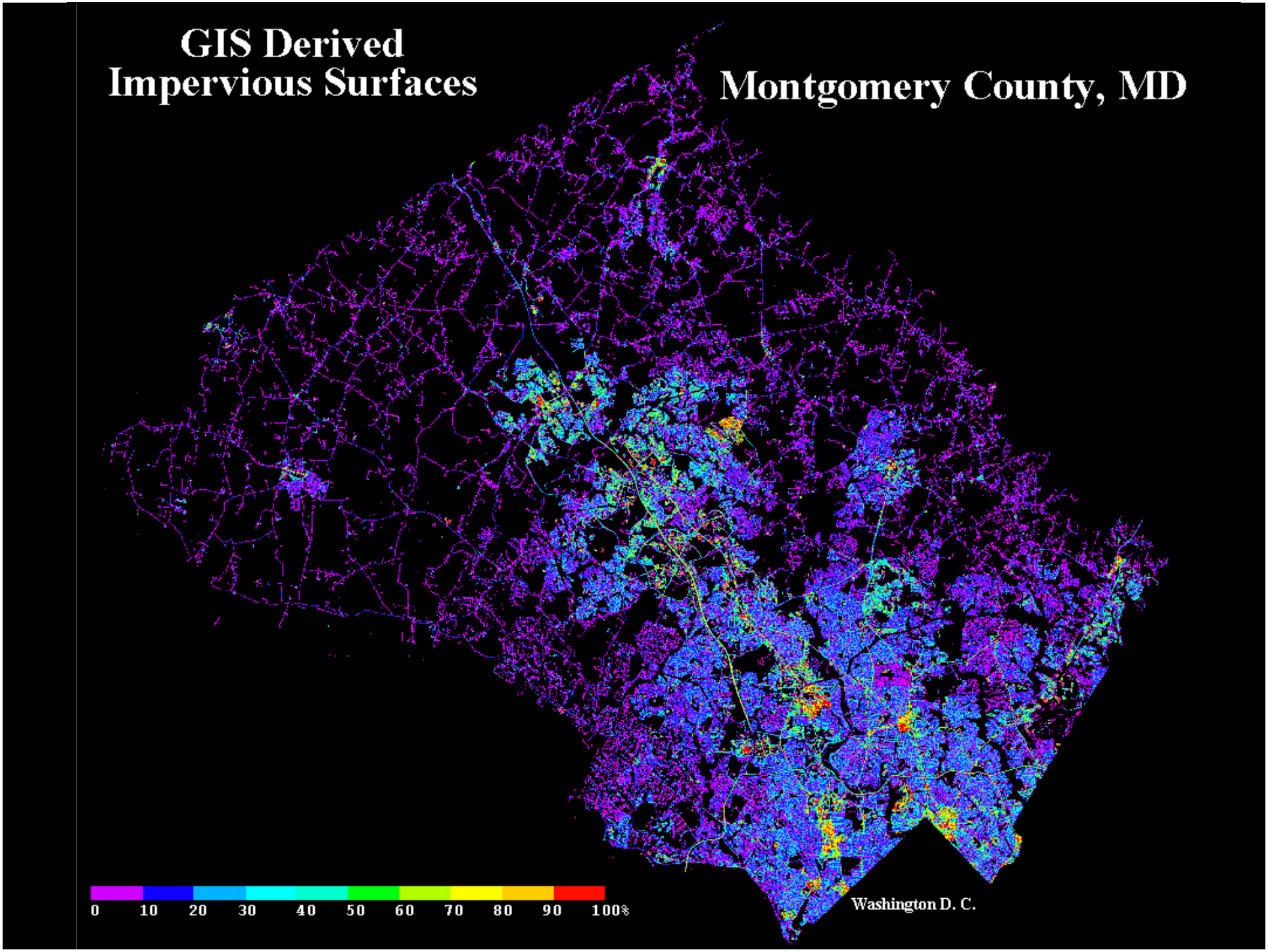


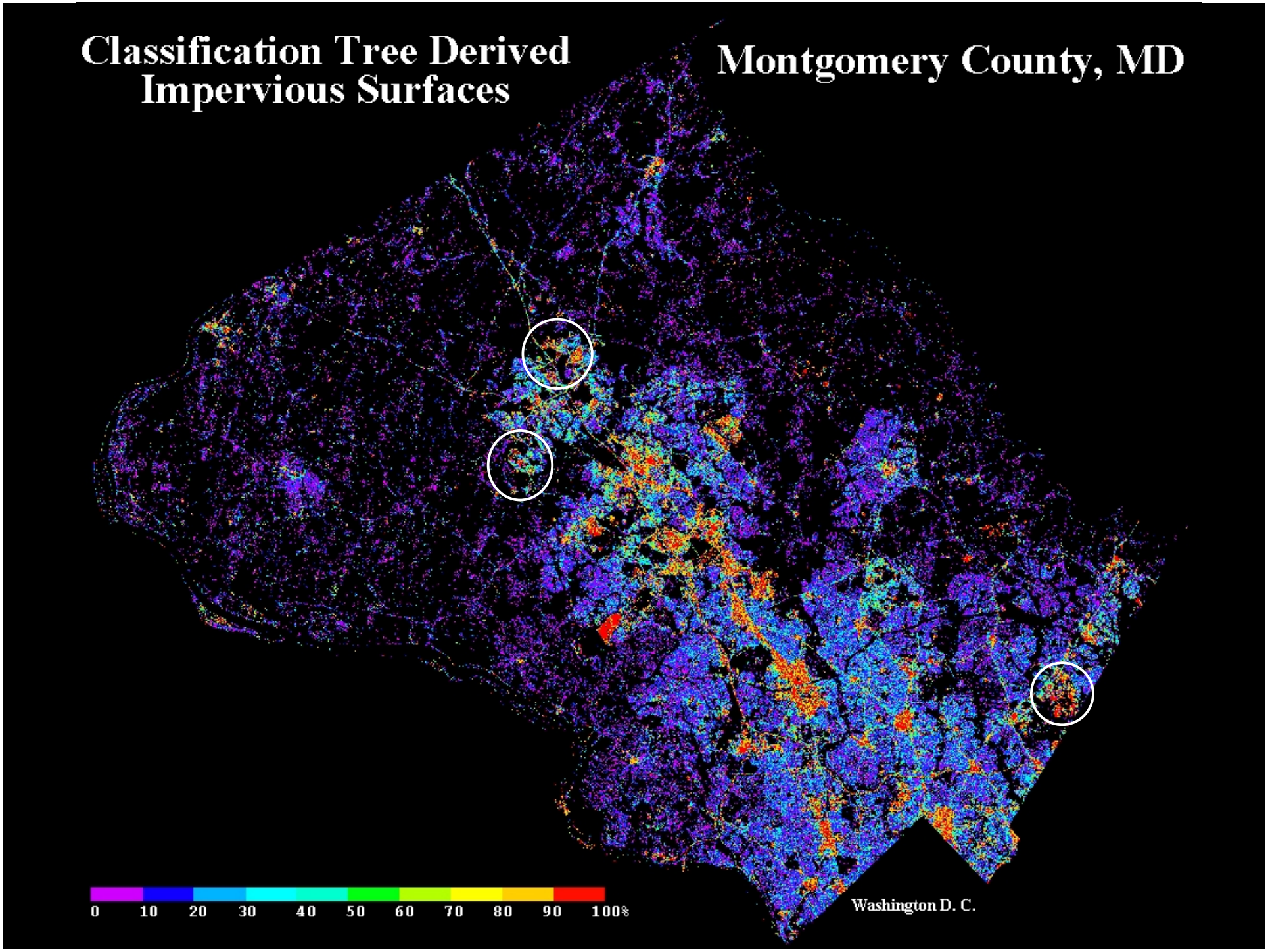
Impervious Surface Area Mapping



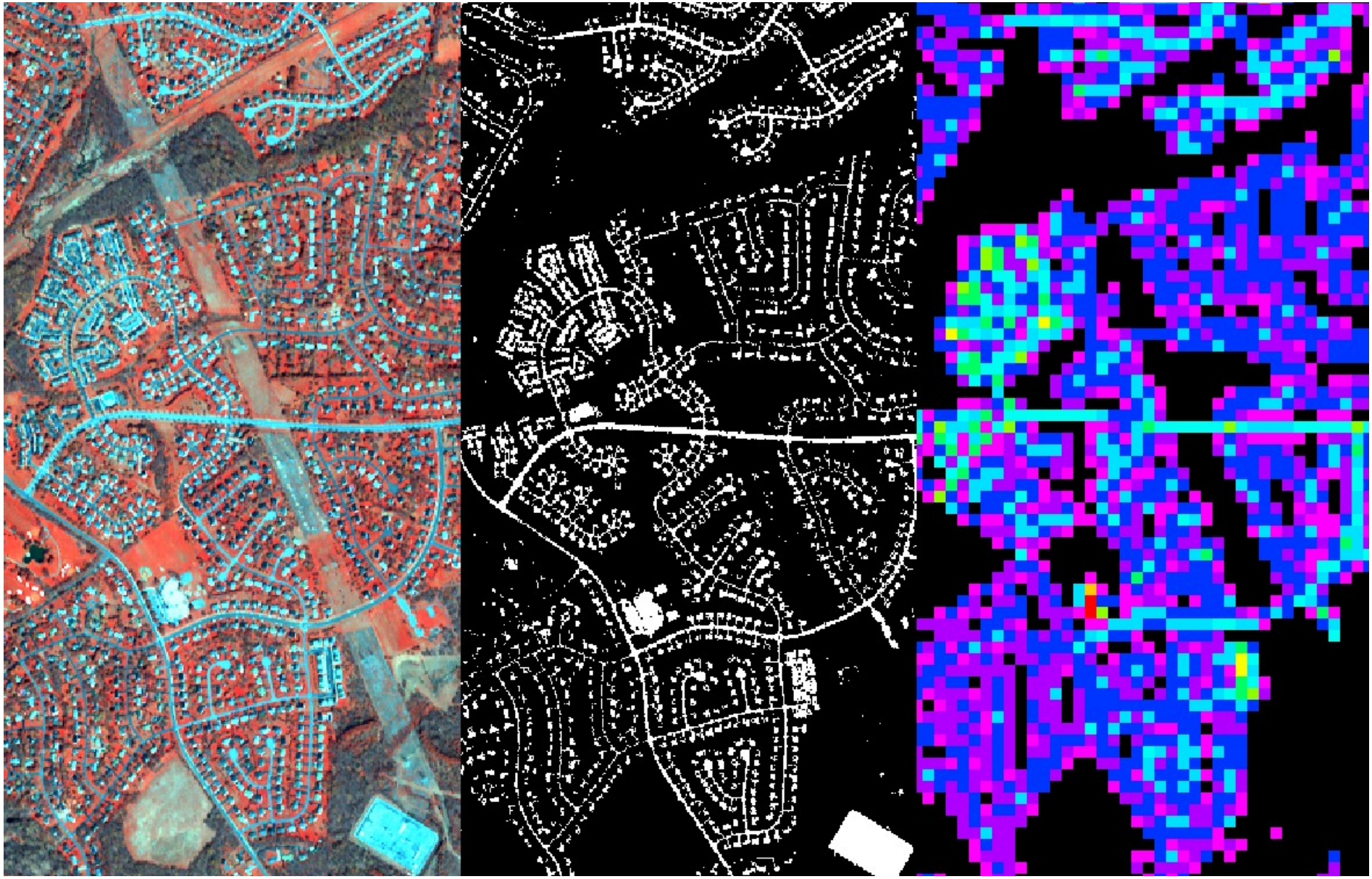
Vector Extraction → 3m to 30m Grid → %Impervious Cover

GIS Processing Steps – Training Data


GIS Derived
Impervious Surfaces
Montgomery County, MD
0
10
20
30
40
50
60
70
80
90
100%
Washington D. C.


Classification Tree Derived
Impervious Surfaces
Montgomery County, MD
0
10
20
30
40
50
60
70
80
90
100%
Washington D. C.

Impervious Surface Mapping



Ikonos 421 | 4m Ikonos map | 30m Subpixel TM

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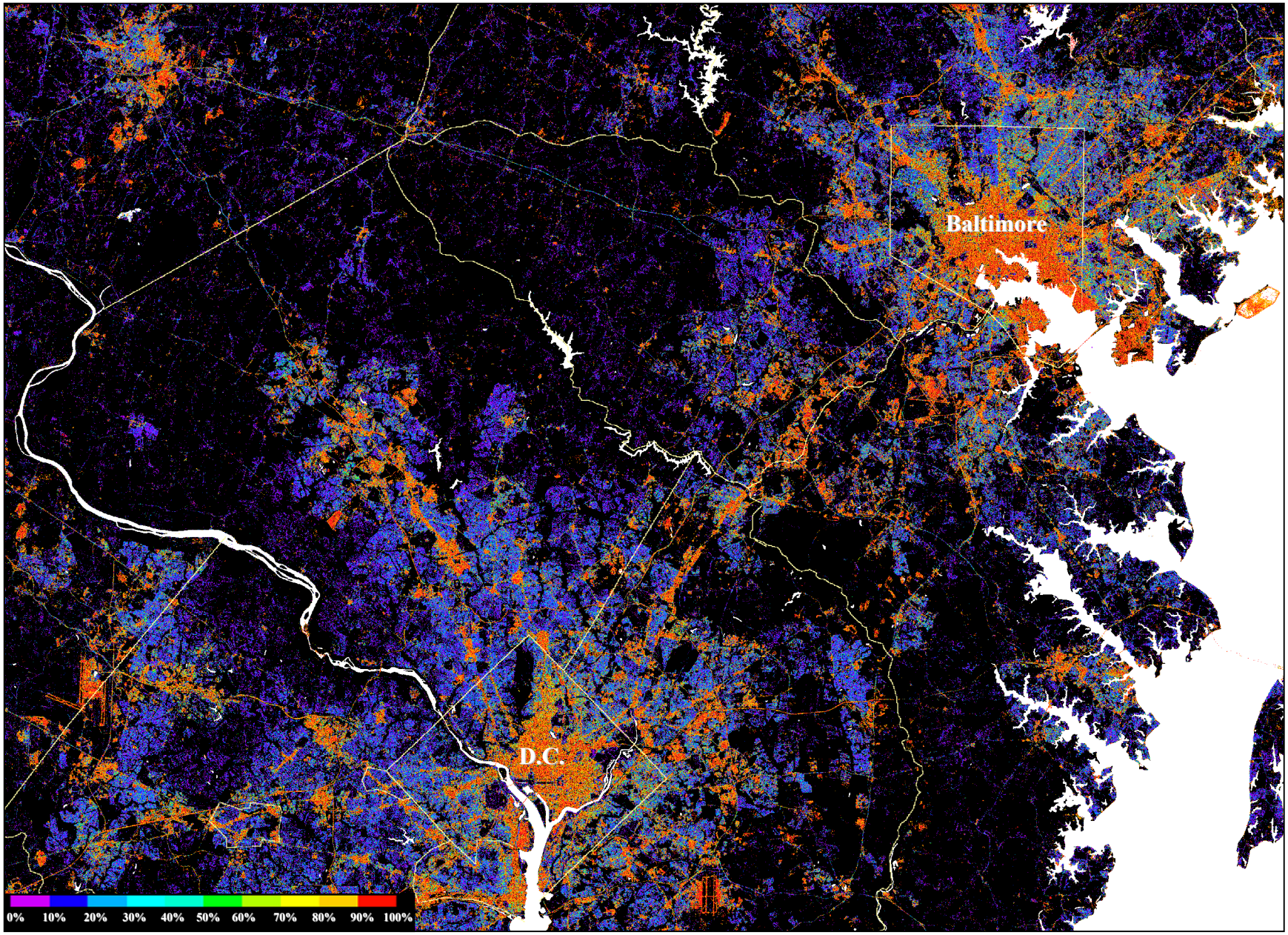
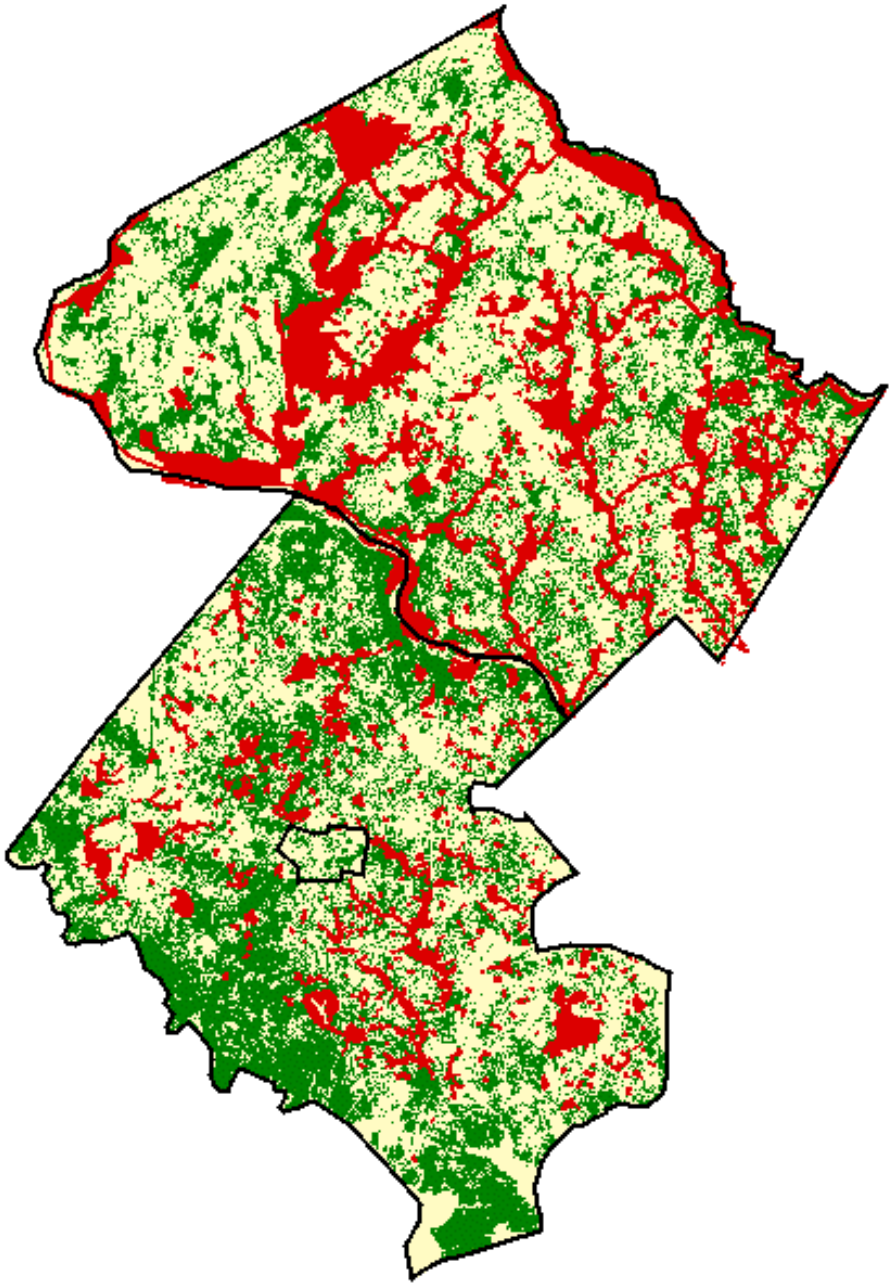
Subpixel Impervious Surface Estimates for the Baltimore-Washington Metropolitan Area





Forest Cover & Parks System in Montgomery and Fairfax counties

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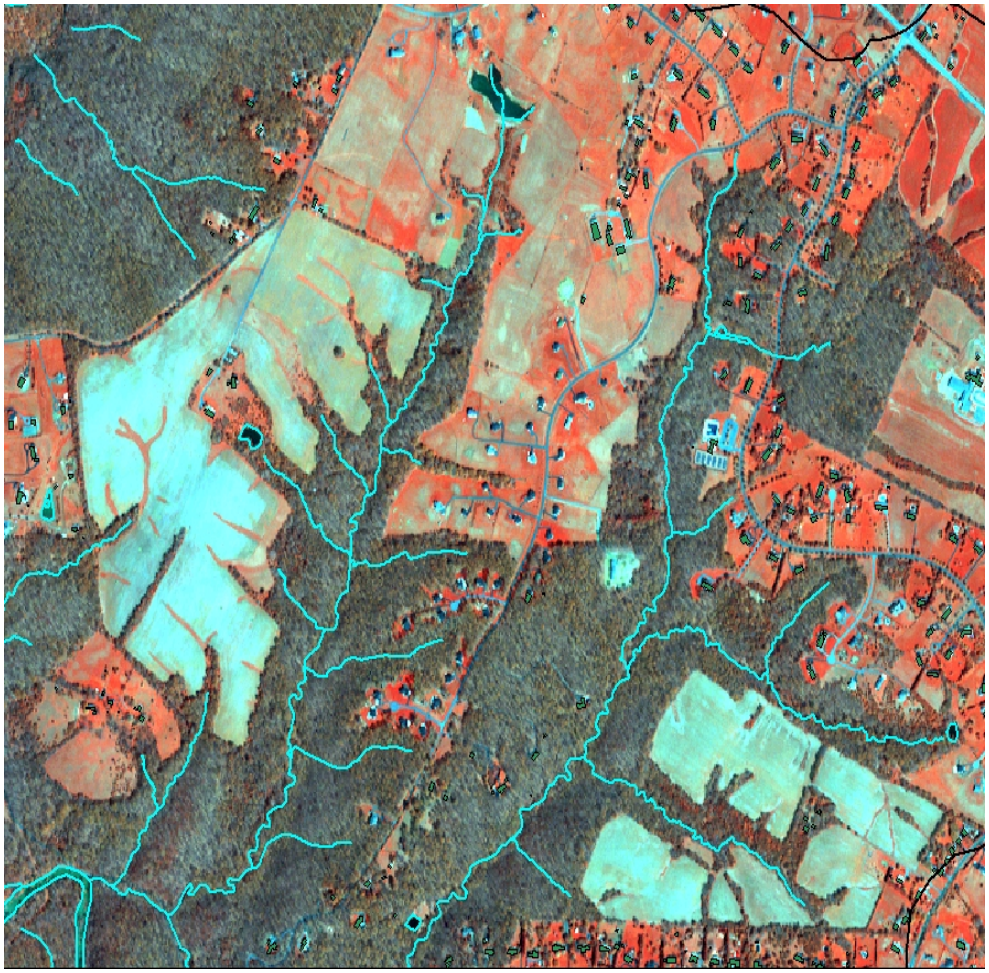
Riparian Forest Buffer Assessment



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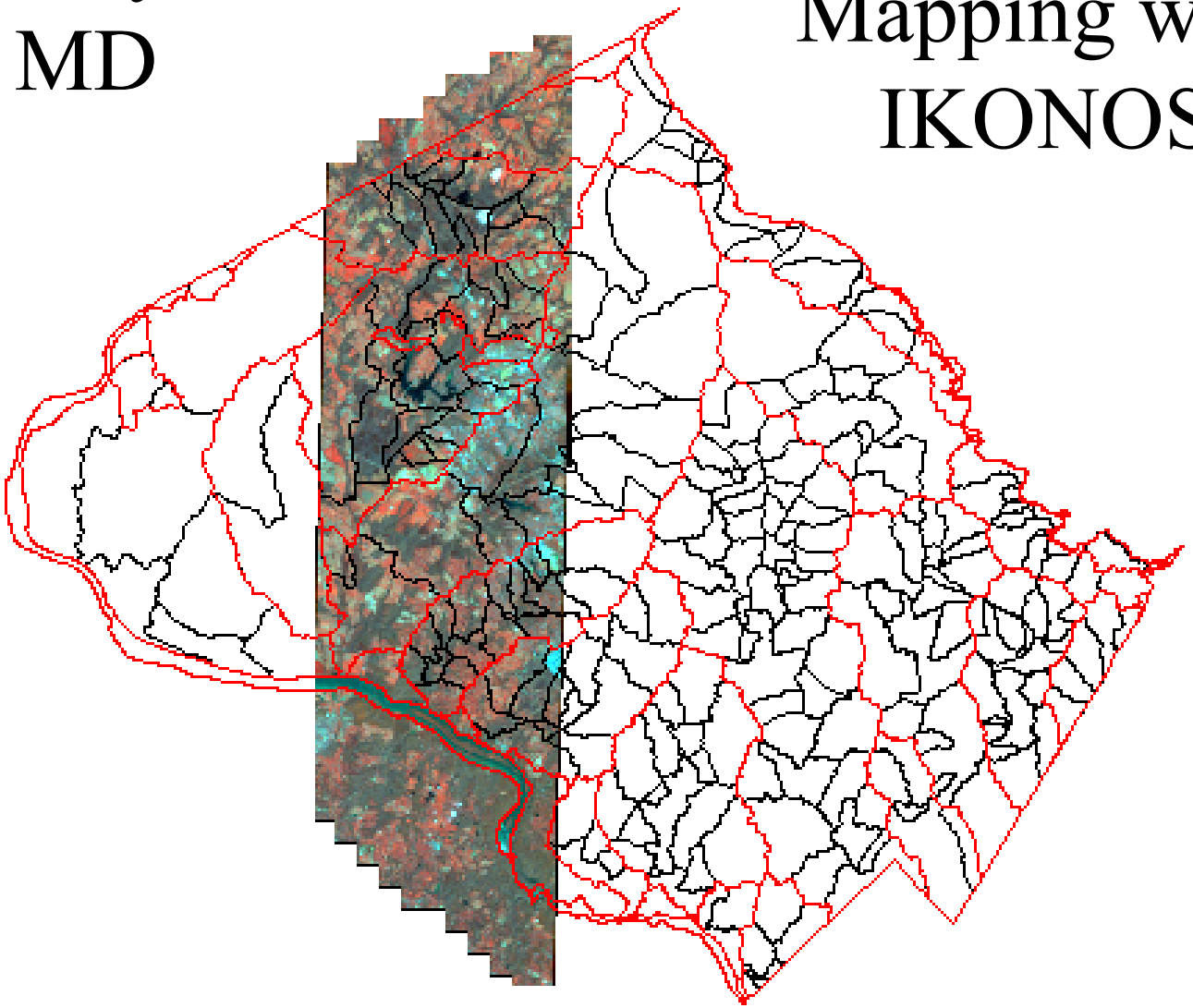
Montgomery County, MD

Forest Buffer Mapping with IKONOS



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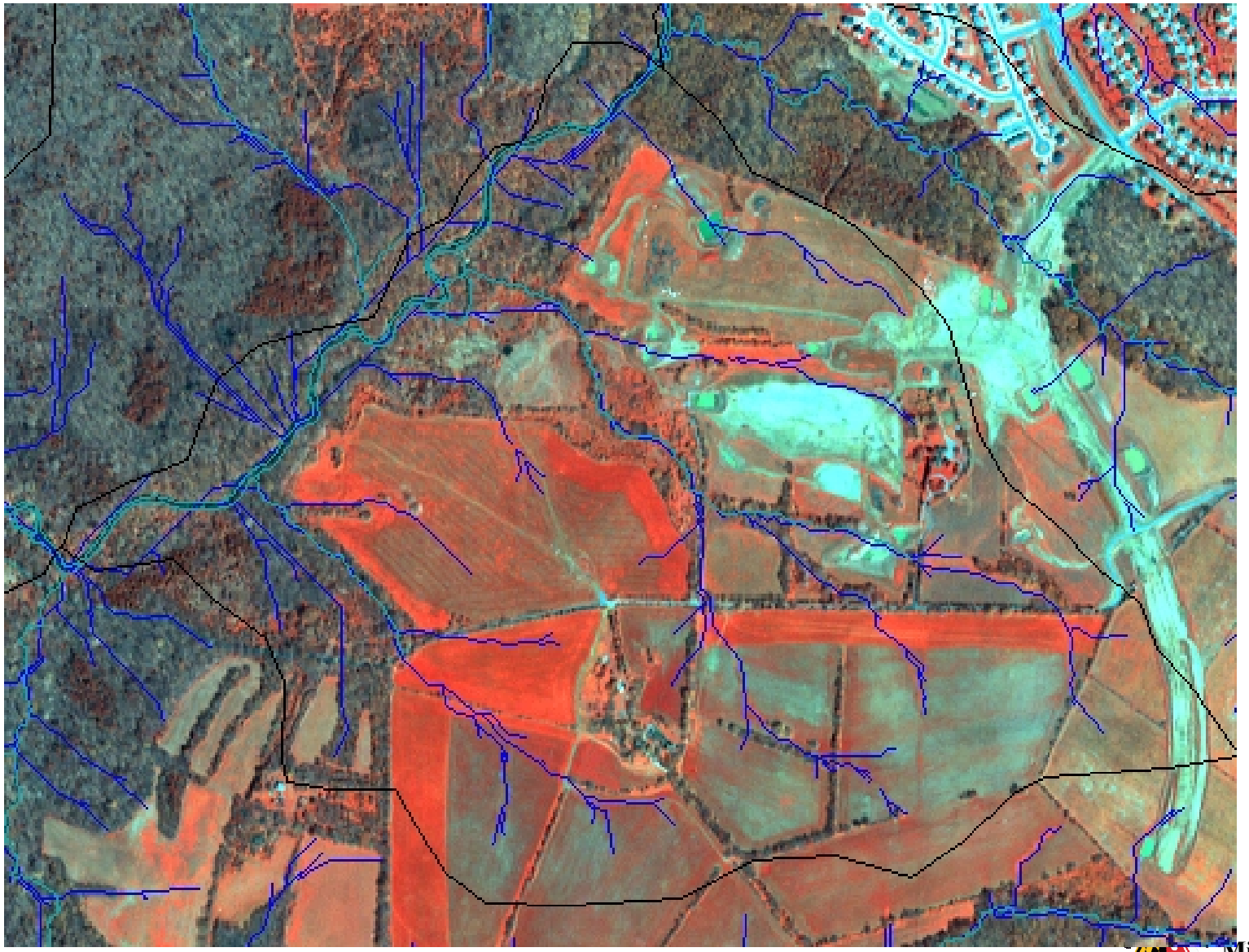
Land Fill Tributary Water Quality Rating: Poor



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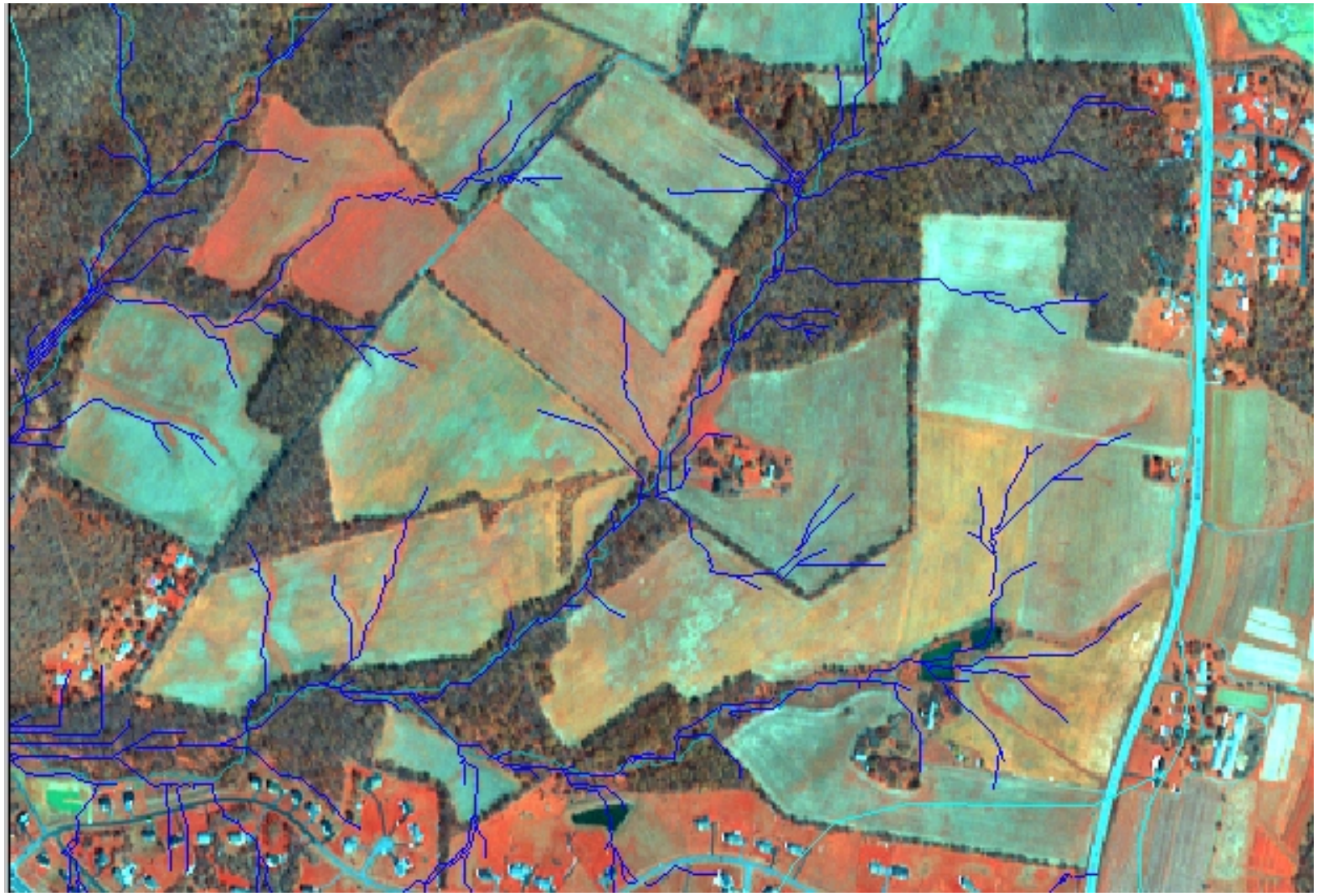
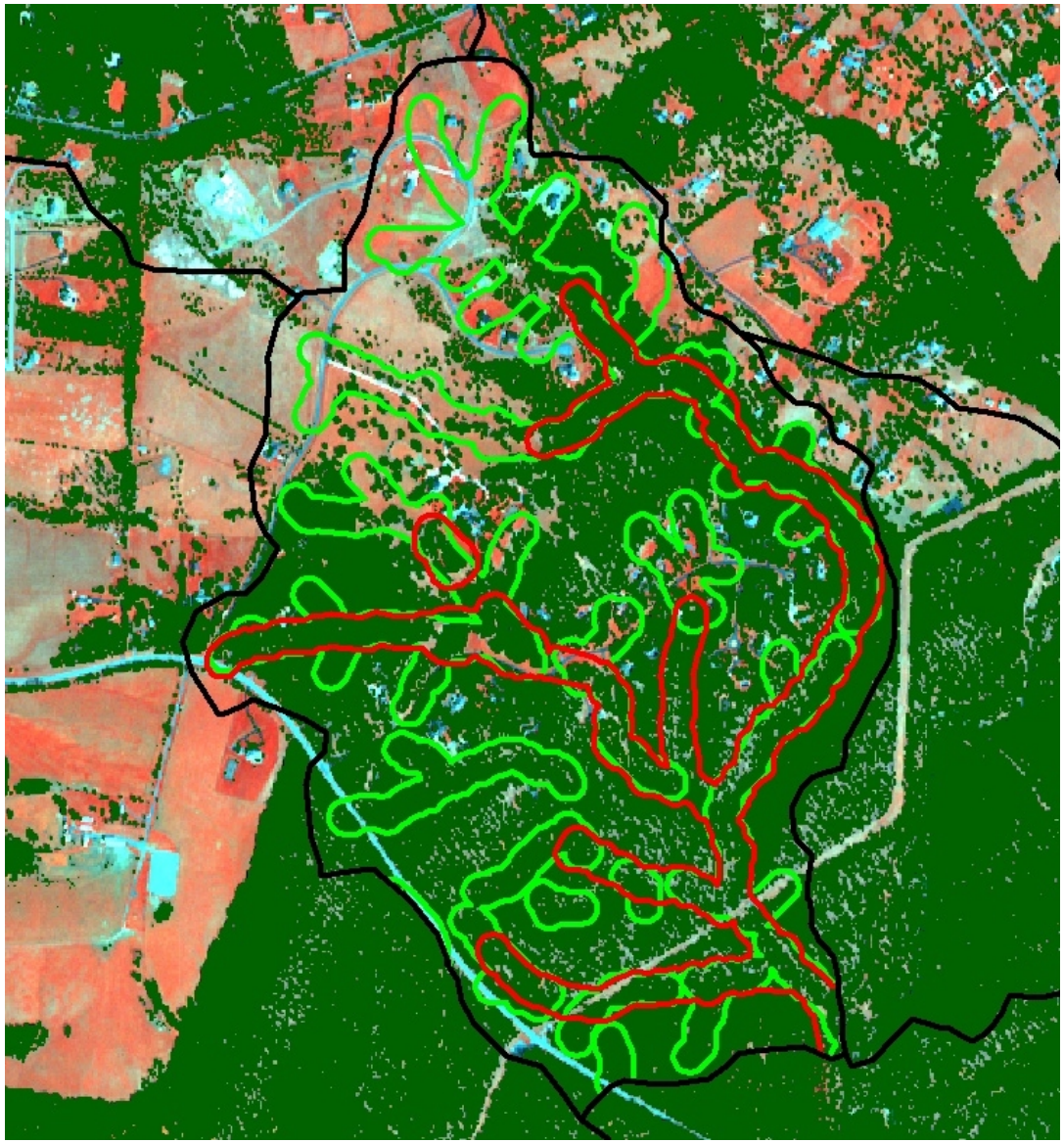
Little Seneca Creek Water Quality
Rating: Excellent



Mid-Atlantic RESAC



Reporting Statistics for Forested Riparian Buffers

Riverwood Area, Mont. Co
30m Buffer

Current Hydro Layer
85% forested

Improved Hydro Layer
65% forested

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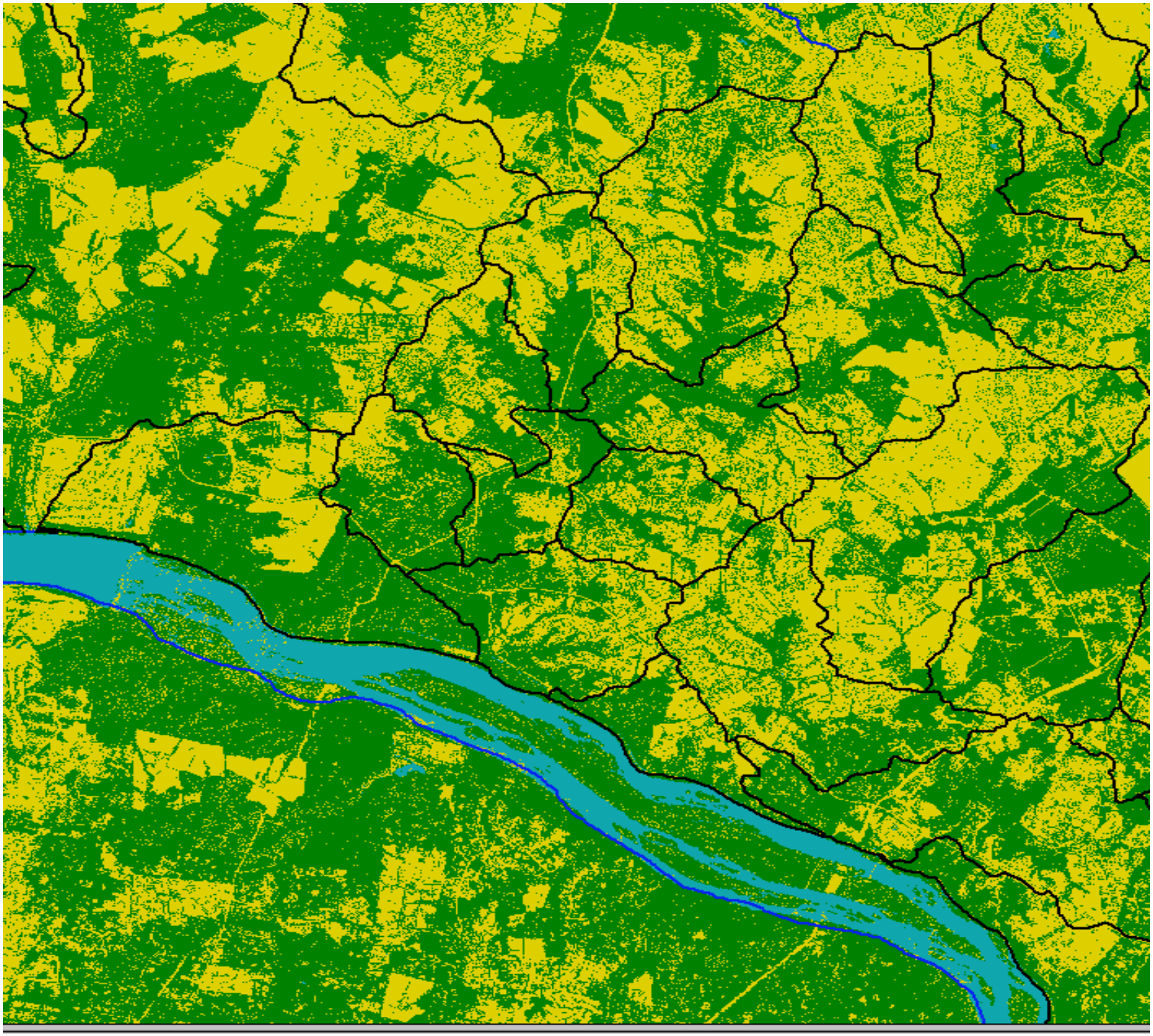

IKONOS Forest Cover Map

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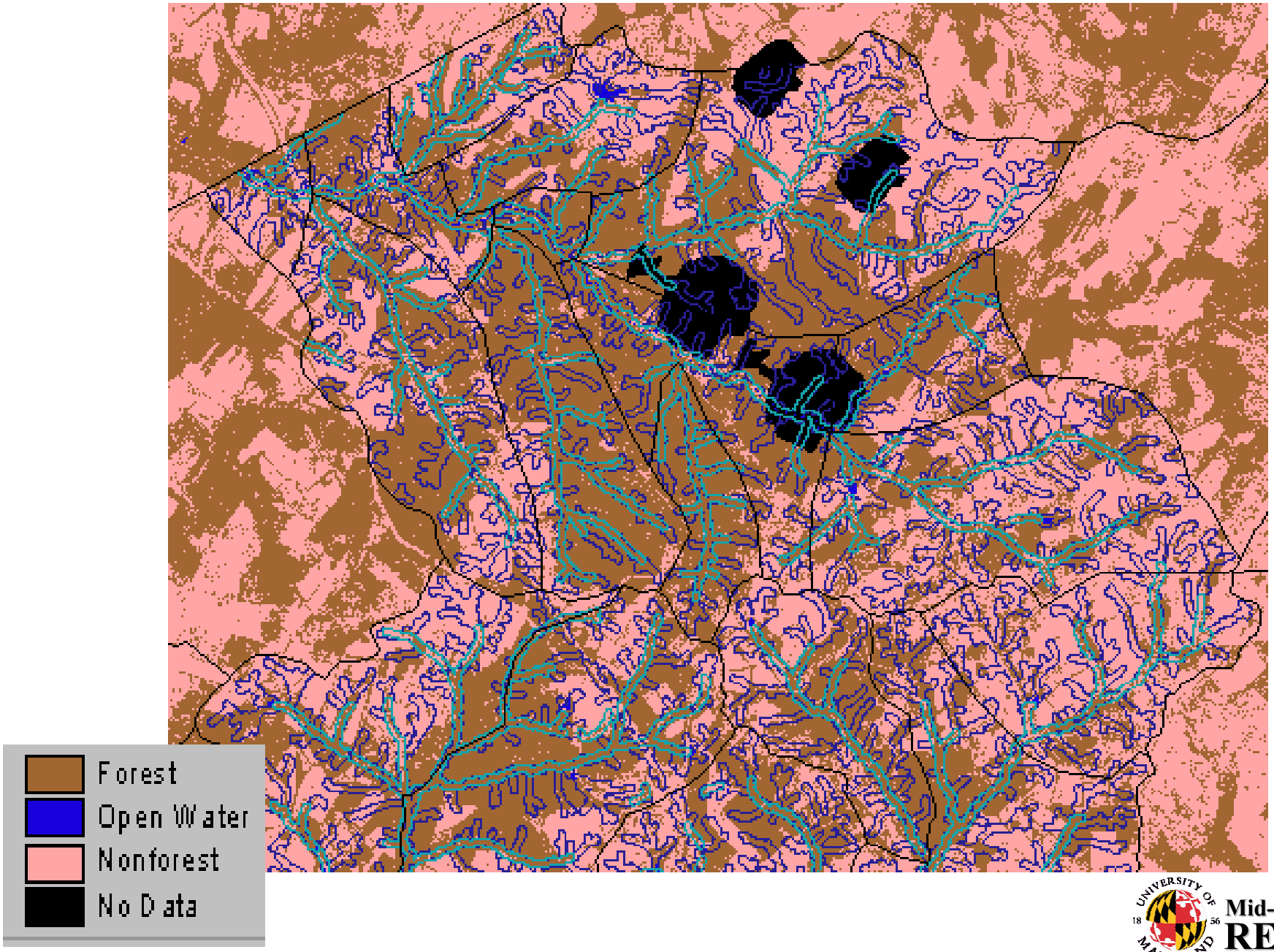
IKONOS Land Cover Classification



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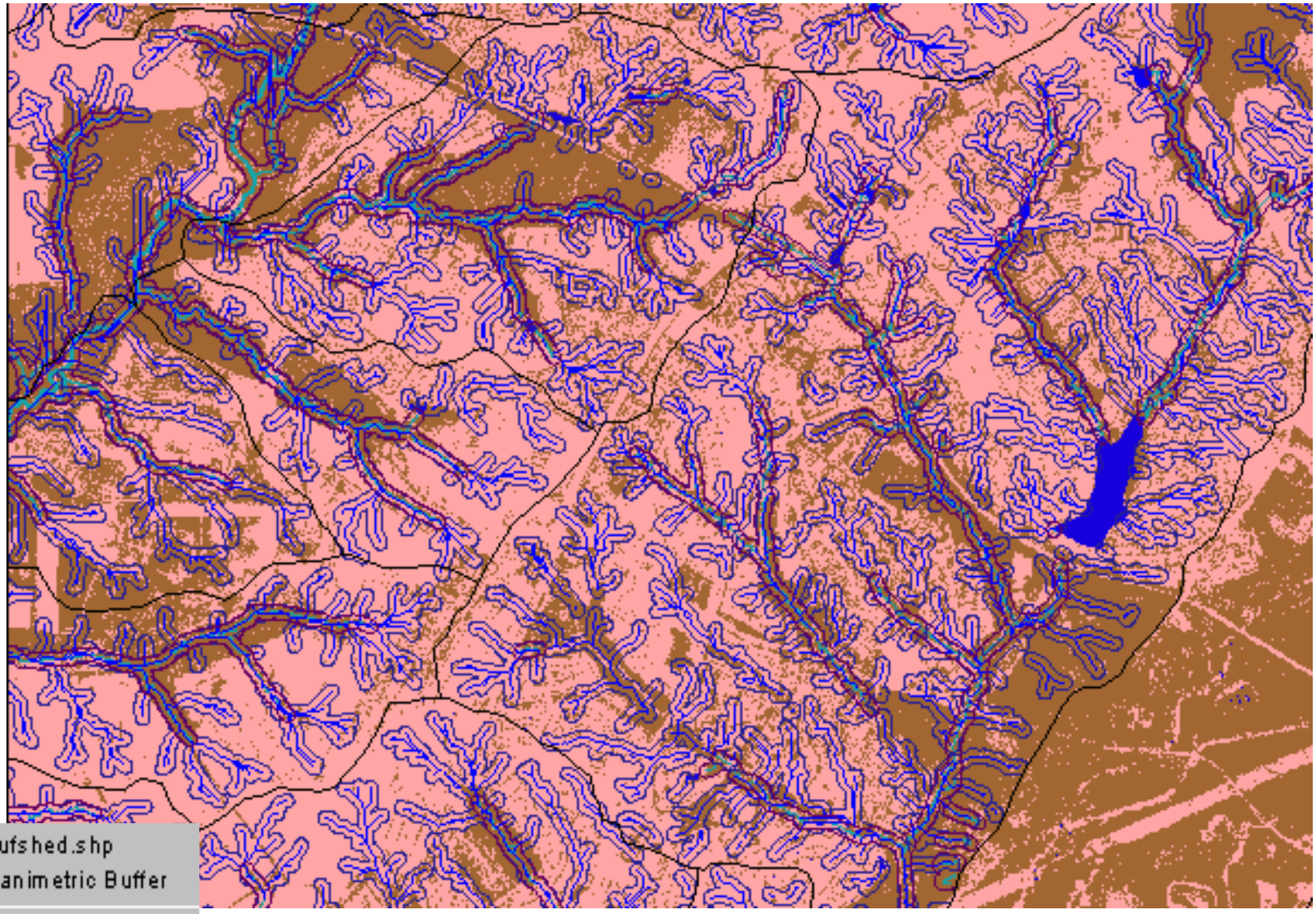
30 m Stream Buffers: Planimetric and DEM-derived



Hydrolbufshed.shp
Planimetric Buffer

Demhydbufshed.shp
DEM-derived buffer

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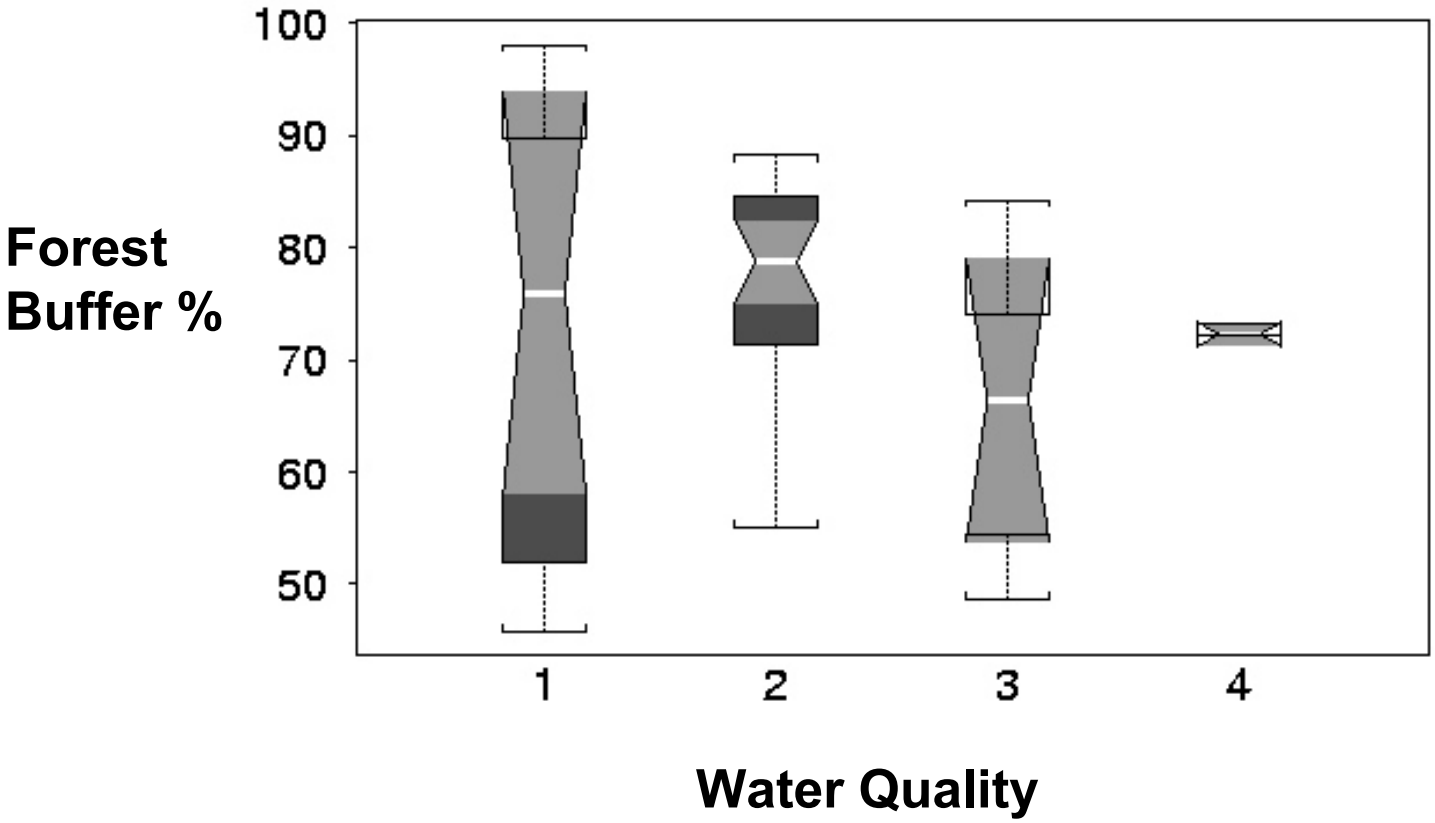
Forest Buffer Area and Water Quality (hydro)



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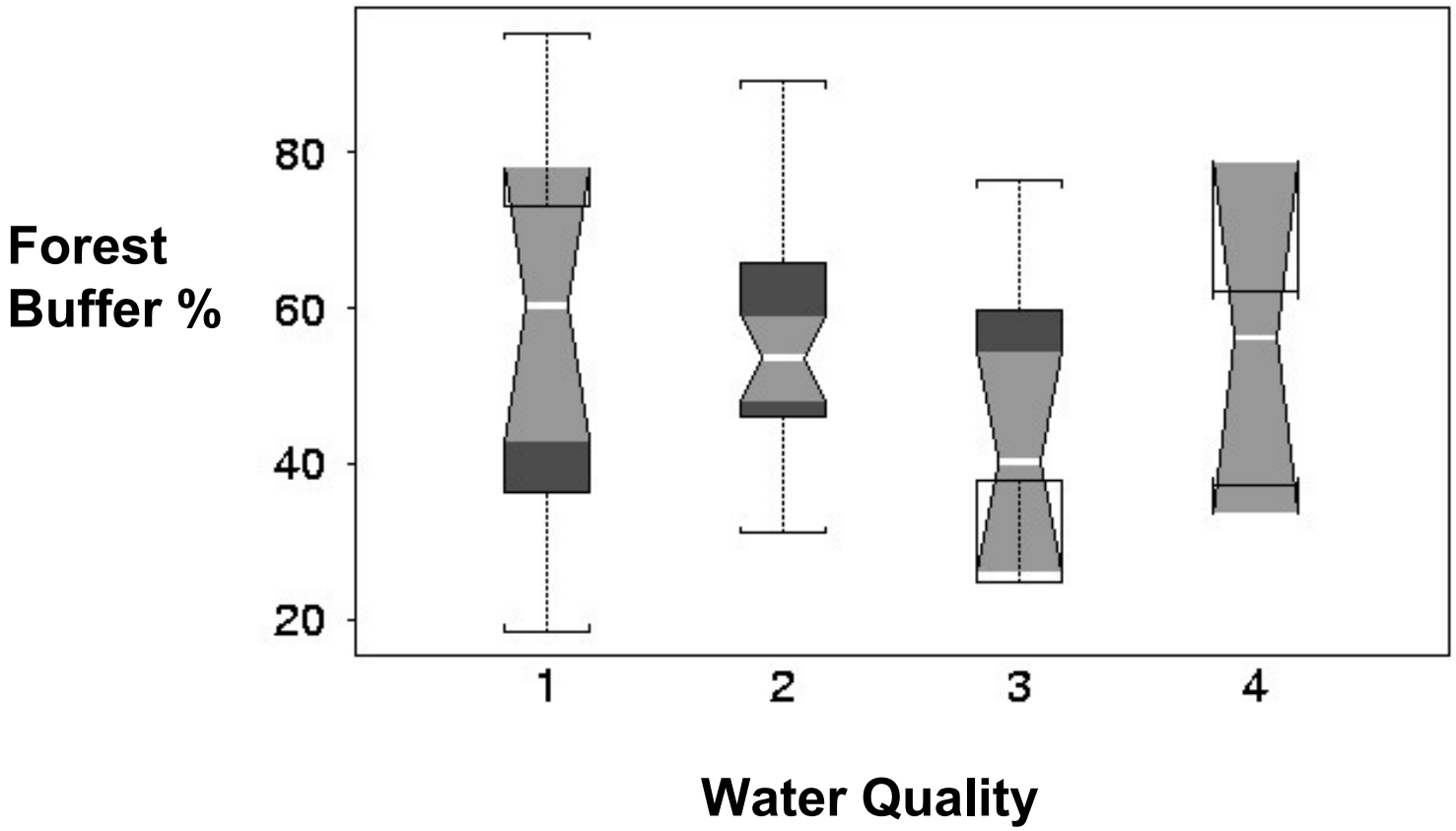
Forest Buffer Area and Water Quality (DEM)



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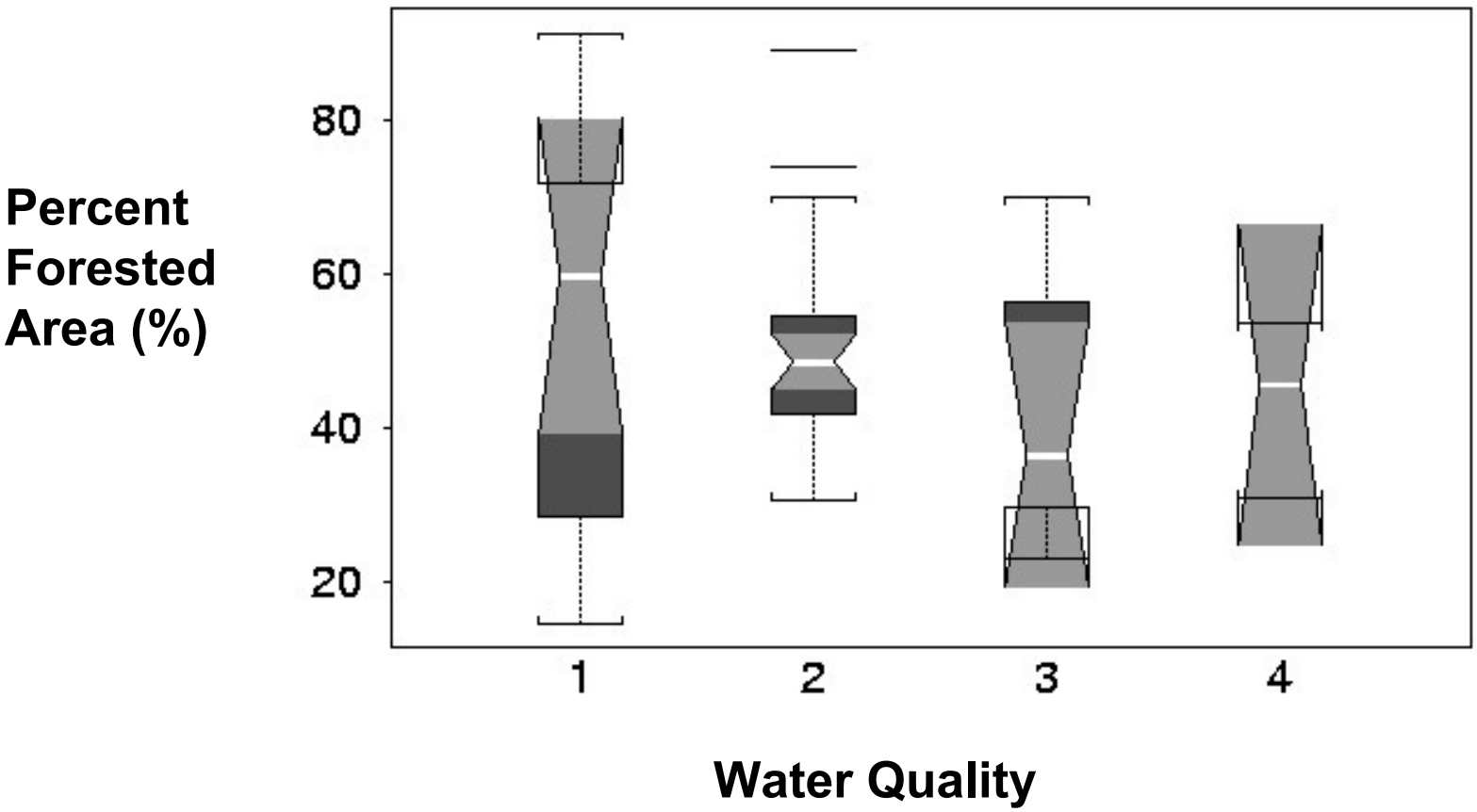
Total Forest Area and Water Quality



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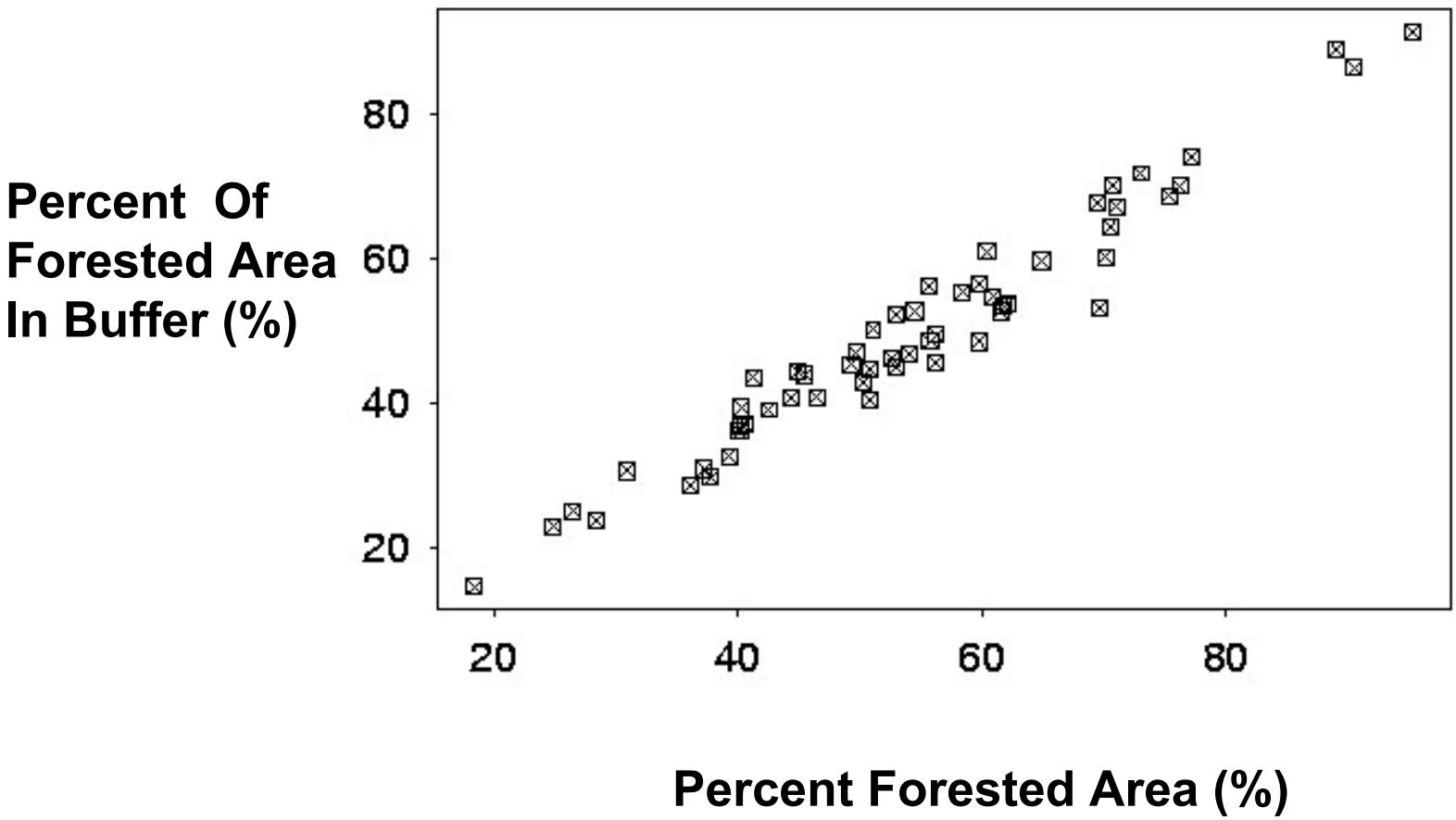
Buffer Area vs Total Forest Area (DEM)



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Conclusions

- Validation of TM scale LC analyses critical - well served by Ikonos.
- Ikonos imagery proving useful for riparian forested buffer, residential density and impervious surface mapping.
- Products are essential for local Gov for resource management - possibly replace / augment existing approaches (e.g., planimetric mapping).
- Ikonos provides valuable finer resolution data for mapping as well as for stream reach scale field work.
- Preliminary classification and analyses (with data collected at stream reach scale) suggest riparian buffers may improve water quality.

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RESAC Activities

- Satellite and aircraft data acquisition
- Geospatial data analyses using GIS
- Land cover and land use analyses

RESAC Services

- Facilitated Workshops
- Technological solutions for applications
- State and Local Governments
- Land Managers
- NGOs

RESAC and Geospatial Service Providers

- EarthSat Corp
- 3Di LLC
- Airborne-1
- EarthData Corp