Mapping Tree Canopy
in Fairfax County

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Overview

- Urban forestry program
- Community demographics
- Extent & nature of tree canopy
- Remote sensing timeline
- 2013 landcover classification
- Application

Urban Forest Management Division

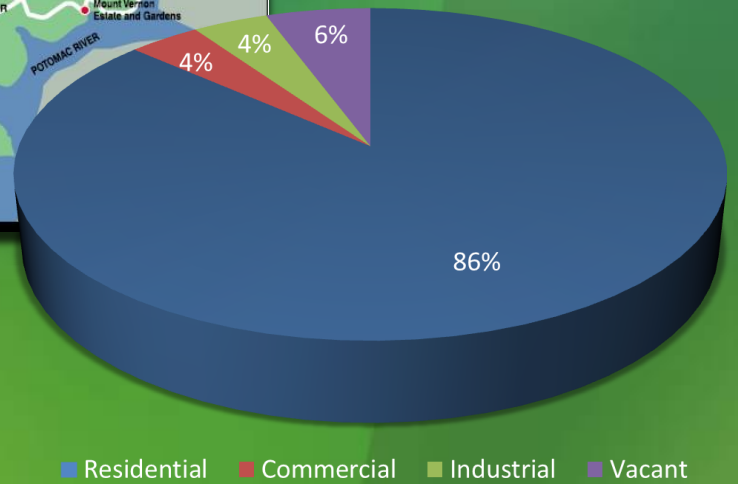
- Formed 1973
- Department of Public Works and Environmental Services
- Aligned within Stormwater Business Area
- 13 fulltime, 5 part-time positions

Urban Forest Management Division

1. Conservation of forest resources during land development (6 positions)
2. Forest pest management (5 positions)
3. Tree Action Plan implementation
4. Policy development

Fairfax County, VA

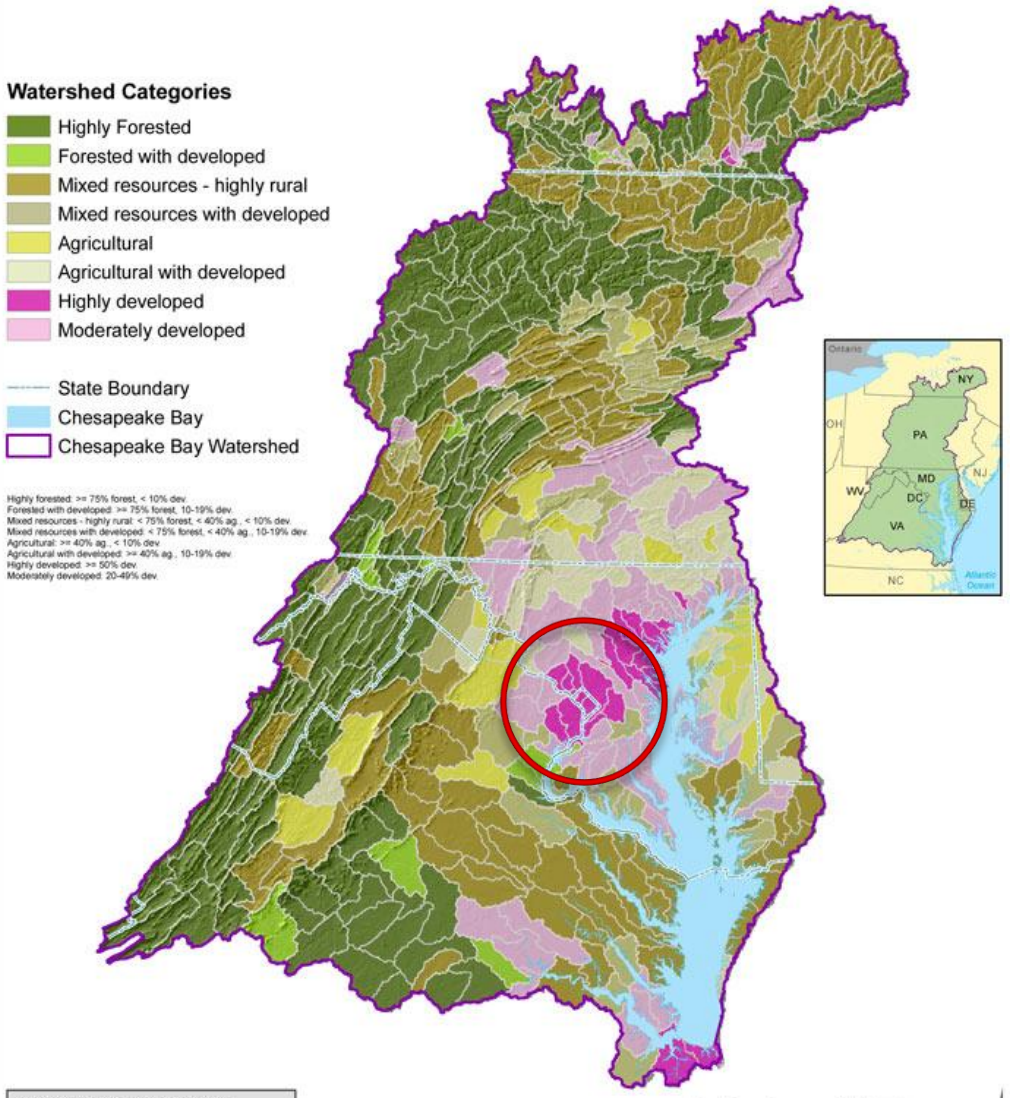
- Chartered 1742
- 1,096,798 Residents
- 394,127 Households
- 252,828 acres
- 395 square miles



Classification of Watersheds

Based on 2000 Land Cover

Chesapeake Bay Program
A Watershed Partnership



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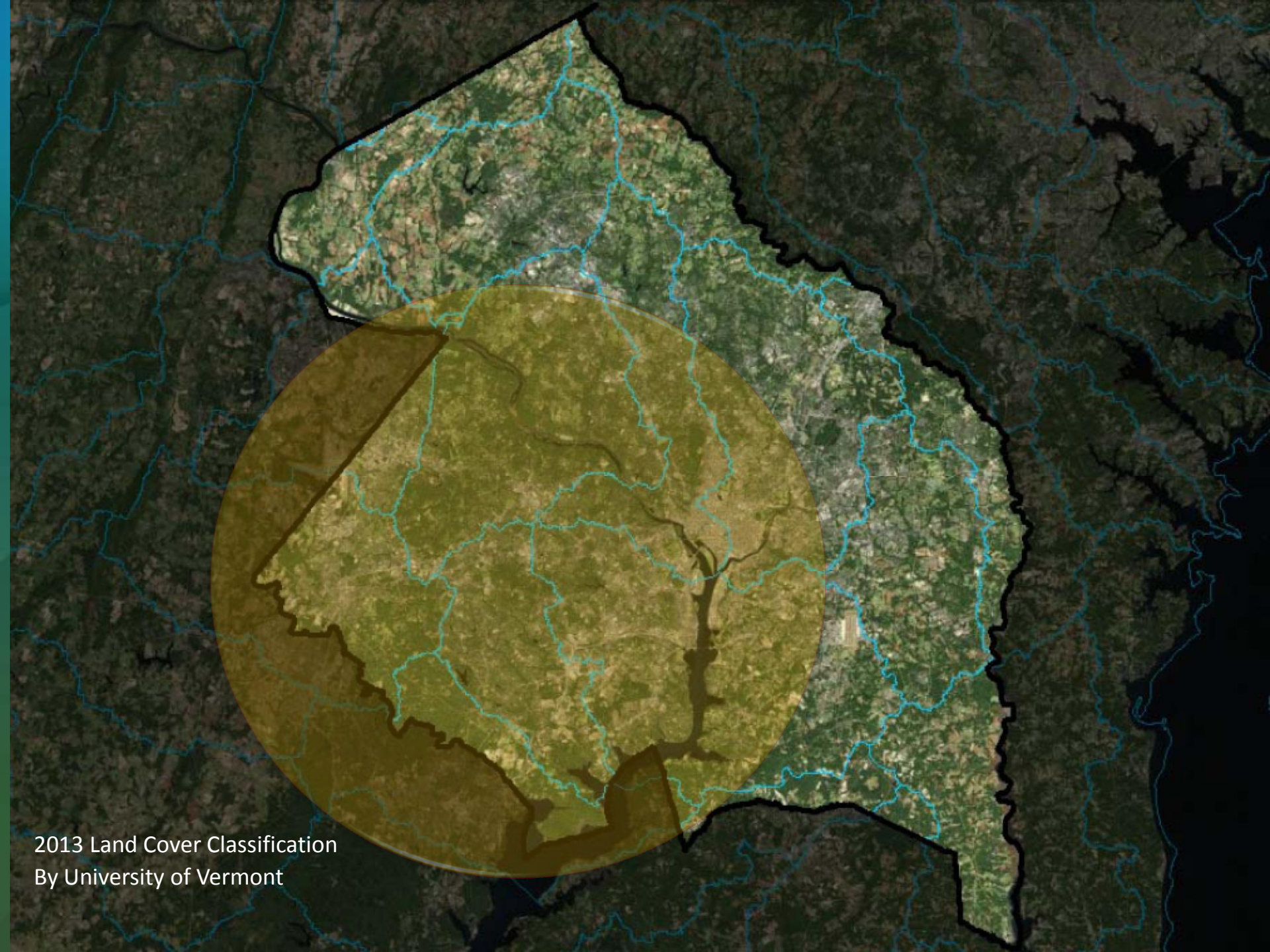
UTM Zone 18N, NAD 83


2013 Land Cover Classification
By University of Vermont

Fairfax County, VA

Extent and nature of tree canopy

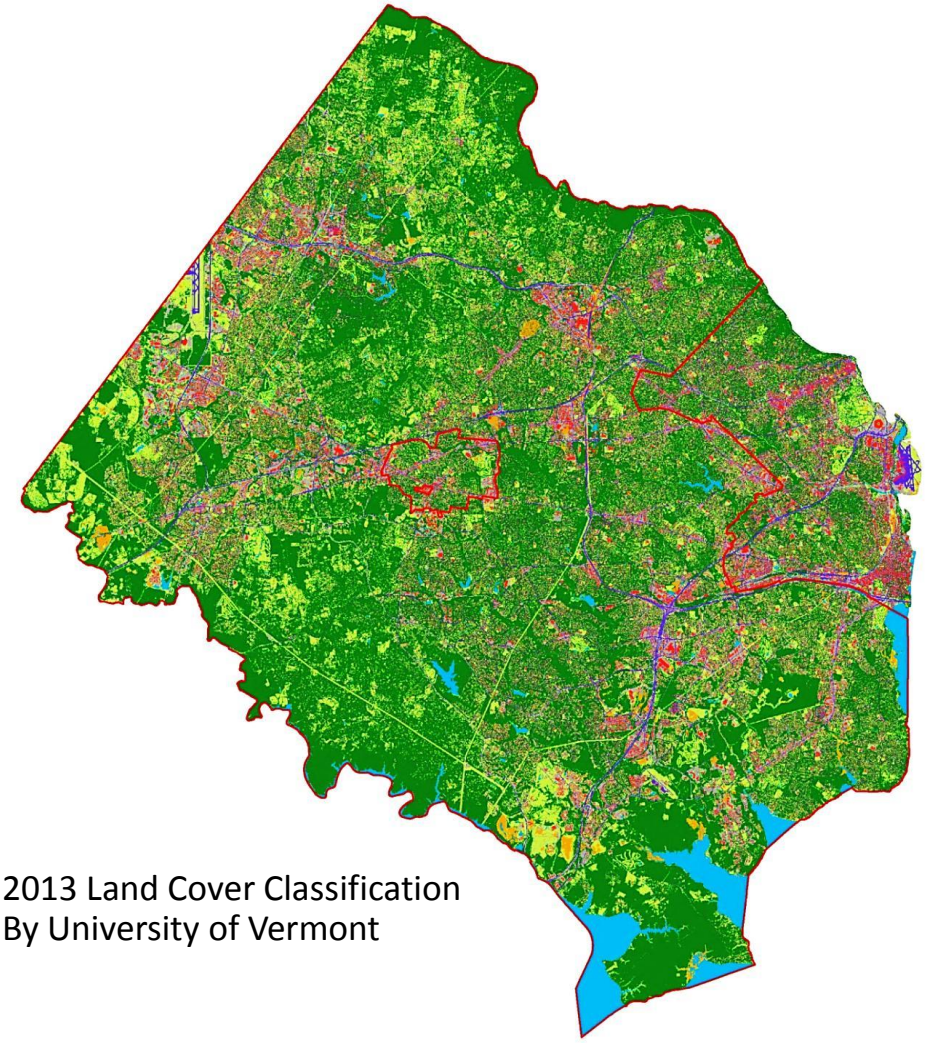
3 geomorphic regions
- Coastal Plain
- Piedmont
- Mesozoic Basin

30 Forest/Woodland Communities (NVCS)

50% Canopy Coverage
- 80% “forested”
- 20% urban landscape canopy

22 million trees

3 most common species:
- Red maple 13.8 %
- American beech 12.%
- Tulip poplar 8.7%



2013 Land Cover Classification
By University of Vermont

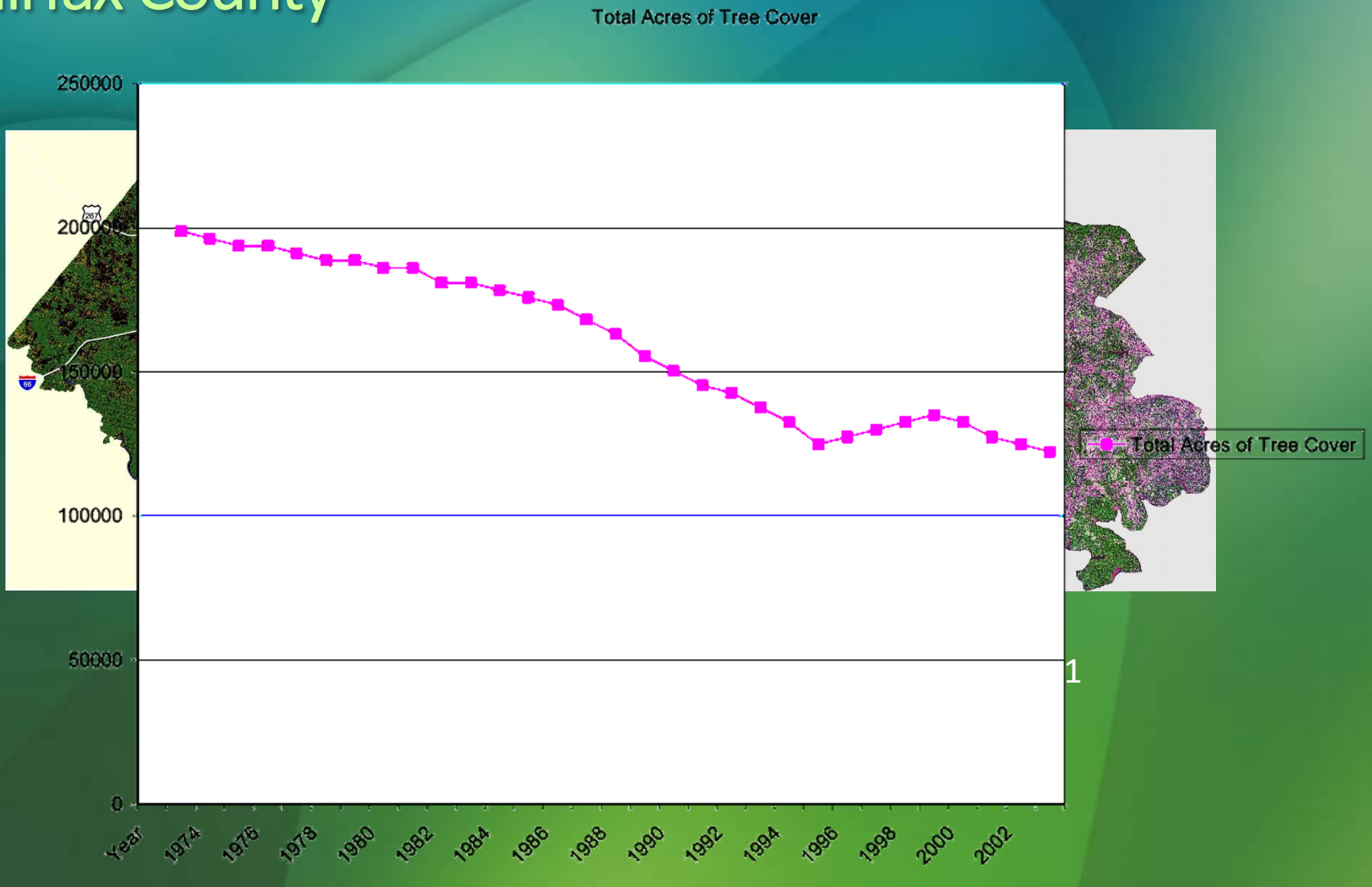
Remote Sensing Projects

Timeline

- 1997 contracted with American Forests
  - Year 1973, 1986, 1997
  - change detection
  - 60m and 30m Landsat imagery
- 1998 in-house
  - Year 2000
  - 10m SPOT monochromatic leaf off
- 2004 in-house
  - Year 2003
  - 2.3m multispectral
- 2013 contracted with University of Vermont
  - Year 2011
  - 0.4 m pan-sharpened and LIDaR

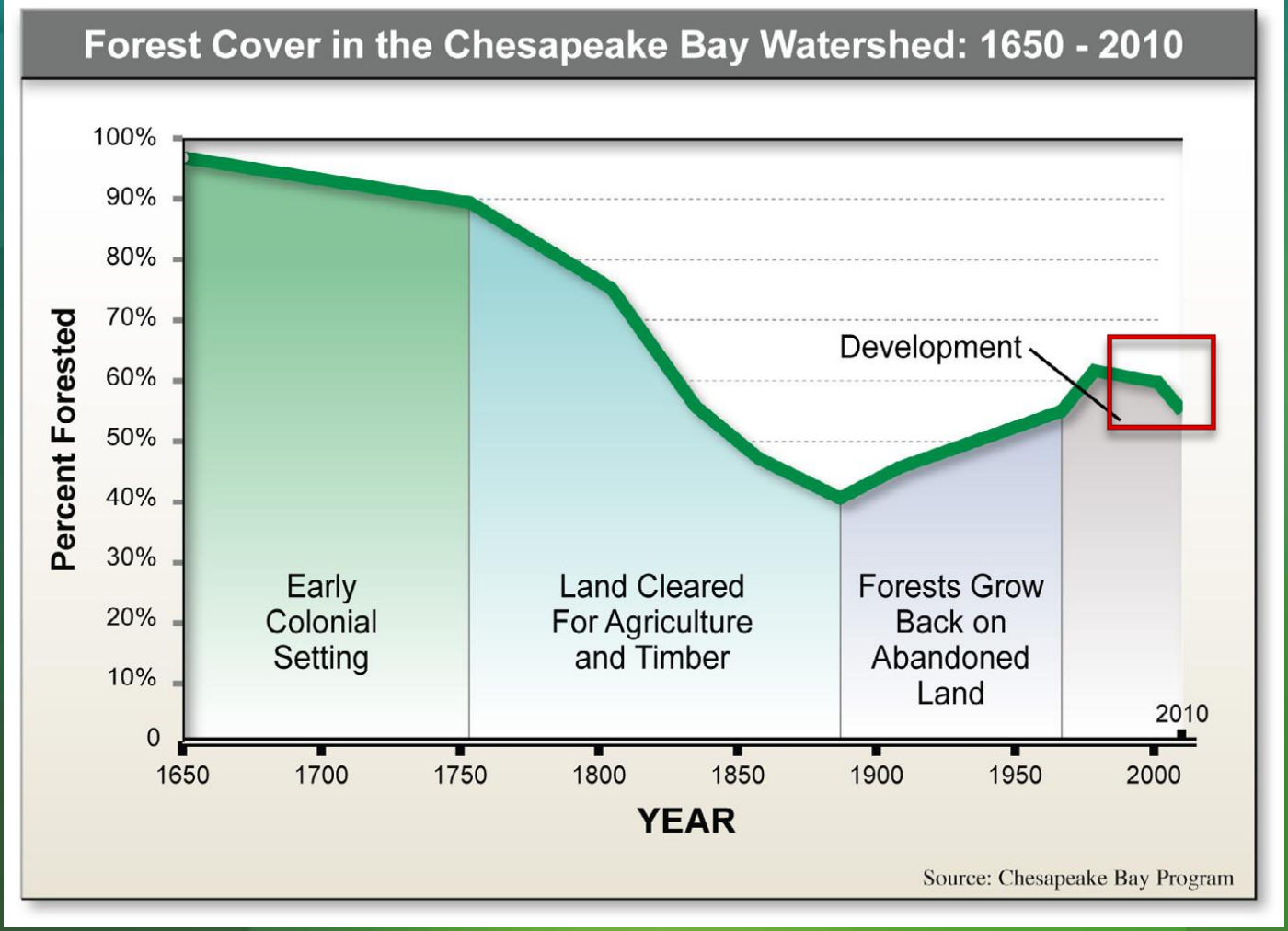
Remote Sensing of Tree Canopy

Fairfax County



Deforestation

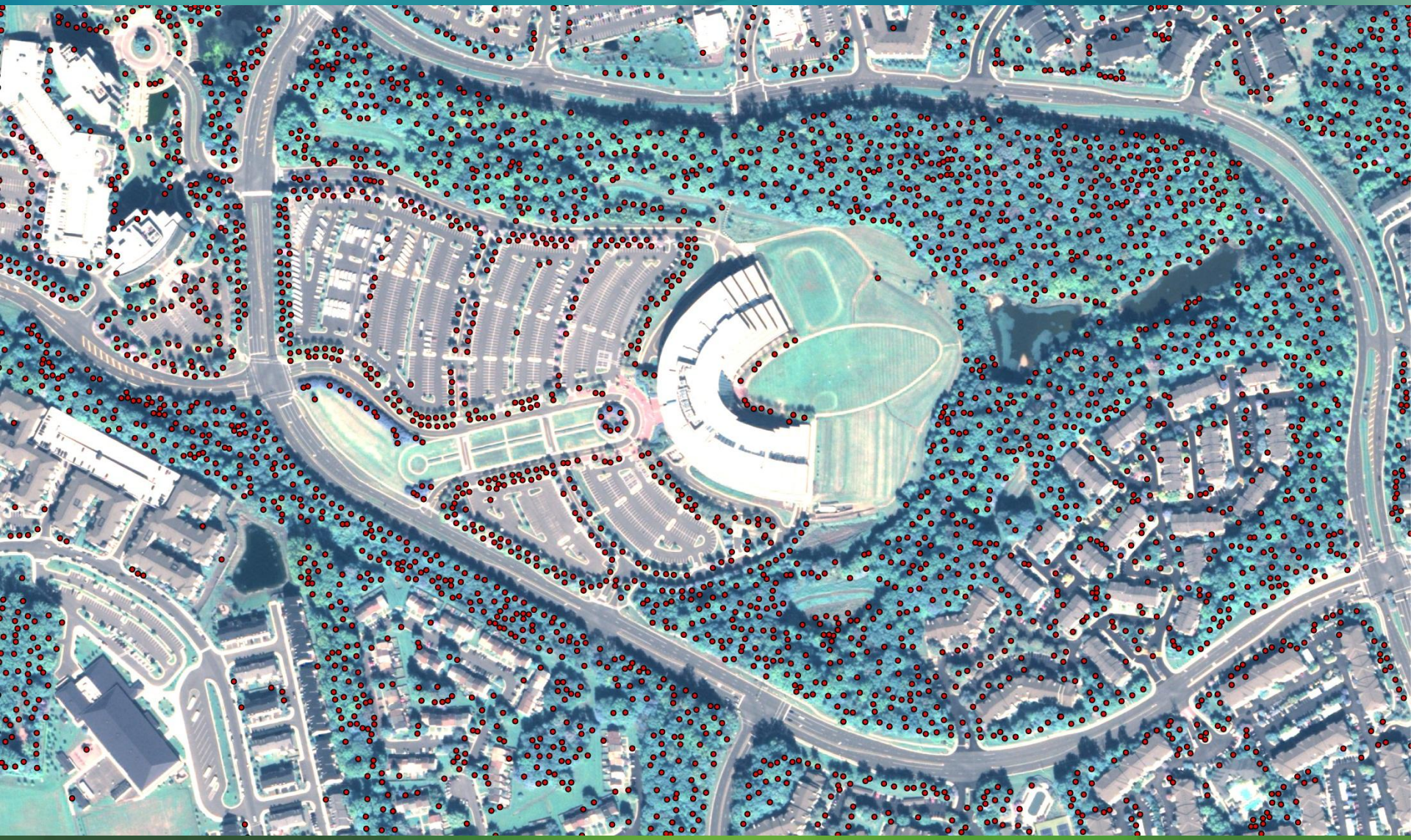
Chesapeake Bay Watershed



2013 landcover classification

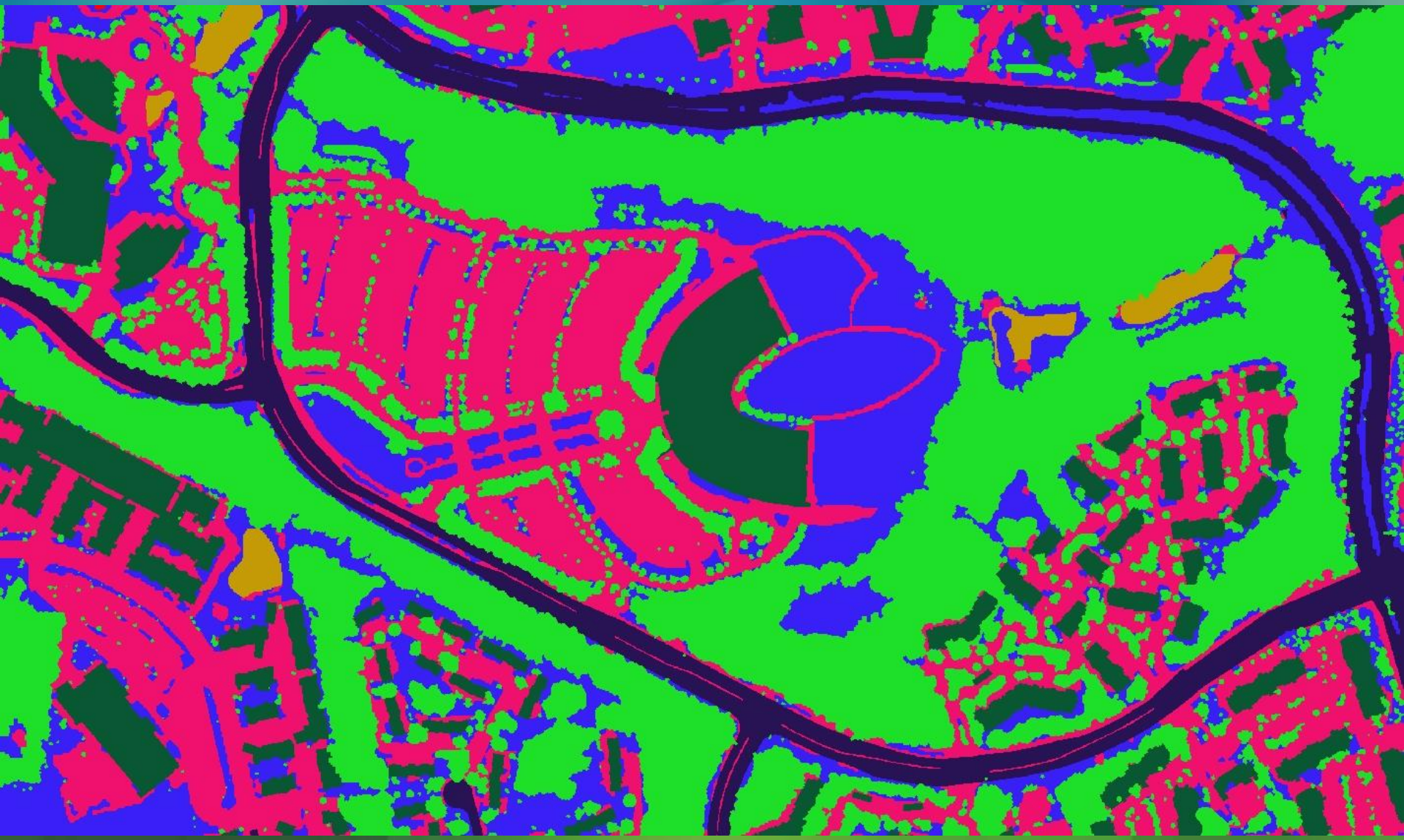
LIDaR tree height data (Laser Imaging Detection and Ranging)

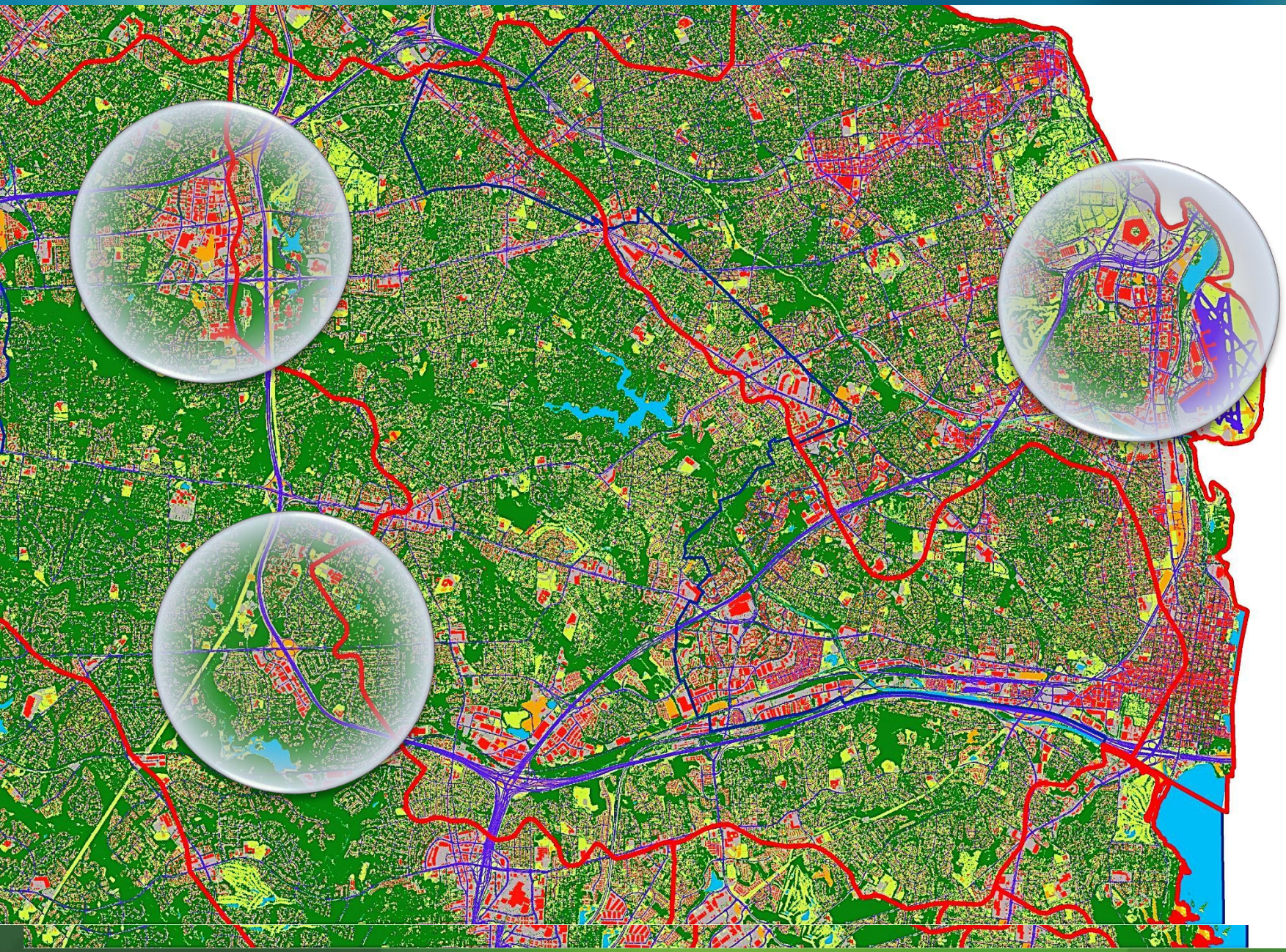
2013 landcover classification



LIDaR trunk data (Laser Imaging Detection and Ranging)

2013 landcover classification





Application

- Change detection
  - Communicating implications of canopy loss/gains
  - Land development policies
  - Comprehensive Plan Policy
- Quantification of Environmental Benefits
  - iTree software tools
  - Eco: quantifying environmental/socio-economic benefits
  - Hydro : quantifying impacts of tree cover on nutrient uptake and hydrology
  - http://www.itreetools.org/eco/index.php
- Review of land development cases and plans
  - Proposed zoning cases and by-right plans
  - Tree Conservation Ordinance
  - Tree Preservation Target feature
  - Chesapeake Bay Ordinance

Application

- Forest pest management
  - Gypsy moth, emerald ash borer, thousand canker
  - Delineation of treatment blocks
- Setting canopy goals
  - Watershed and countywide
  - Preservation and reforestation opportunities
- Watershed Management Plans
- Forest management plans
  - Based on community types
- Wildlife management plans
- Greenway corridor planning
- Green infrastructure mapping

Application at Regional Level

- Regional Air Quality Planning
  - DC 8-hr Ozone Mitigation Plan
  - PM 10
- Regional Tree Canopy Management
  - Wash COG, Climate Energy and Environment Policy Committee
  - Setting Regional Tree Canopy Metrics and Goals
  - Support for Region Forward planning guide
  - Multi-jurisdictional watershed management

Chesapeake Bay Protection Ordinance

- Chesapeake Bay Preservation Areas consist of Resource Protection Areas and Resource Management Areas

- RPA **lands adjacent to water bodies with perennial flow that have an intrinsic water quality value due to the ecological and biological processes they perform**

- RMA **lands that, if improperly used or developed, have a potential for causing significant water quality degradation**

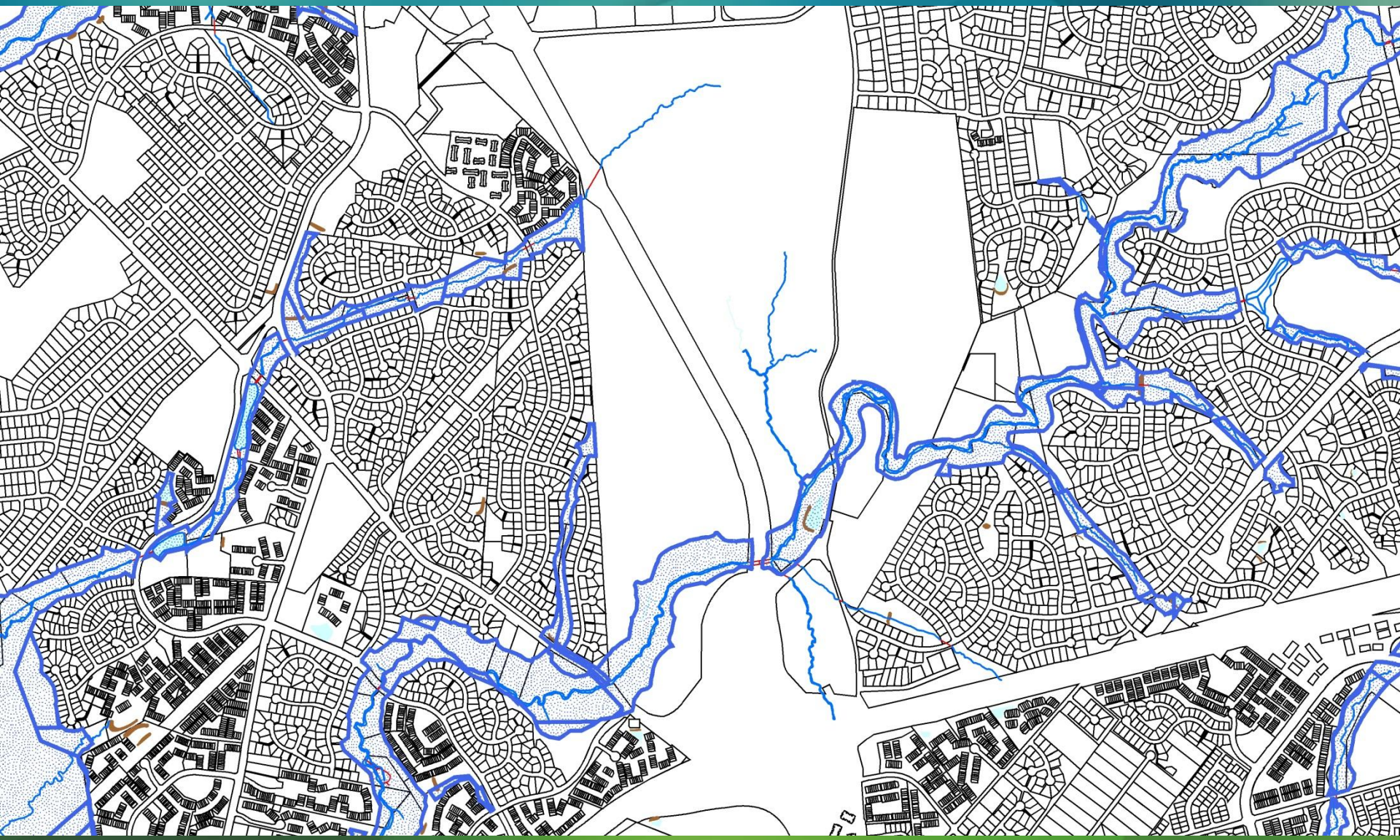
Chesapeake Bay Protection Ordinance

Parcels

Chesapeake Bay Protection Ordinance

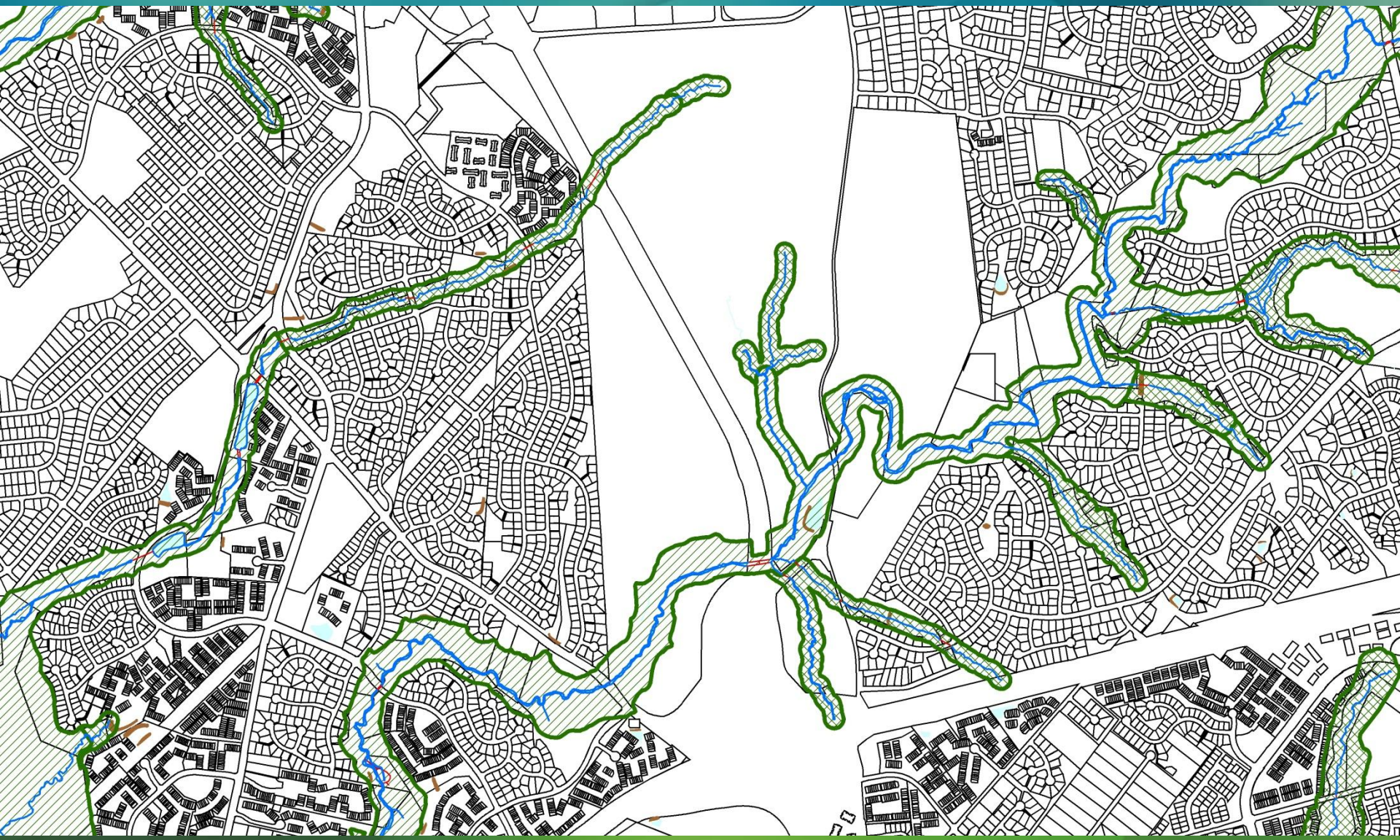
Perennial Streams

Chesapeake Bay Protection Ordinance



Flood Plains

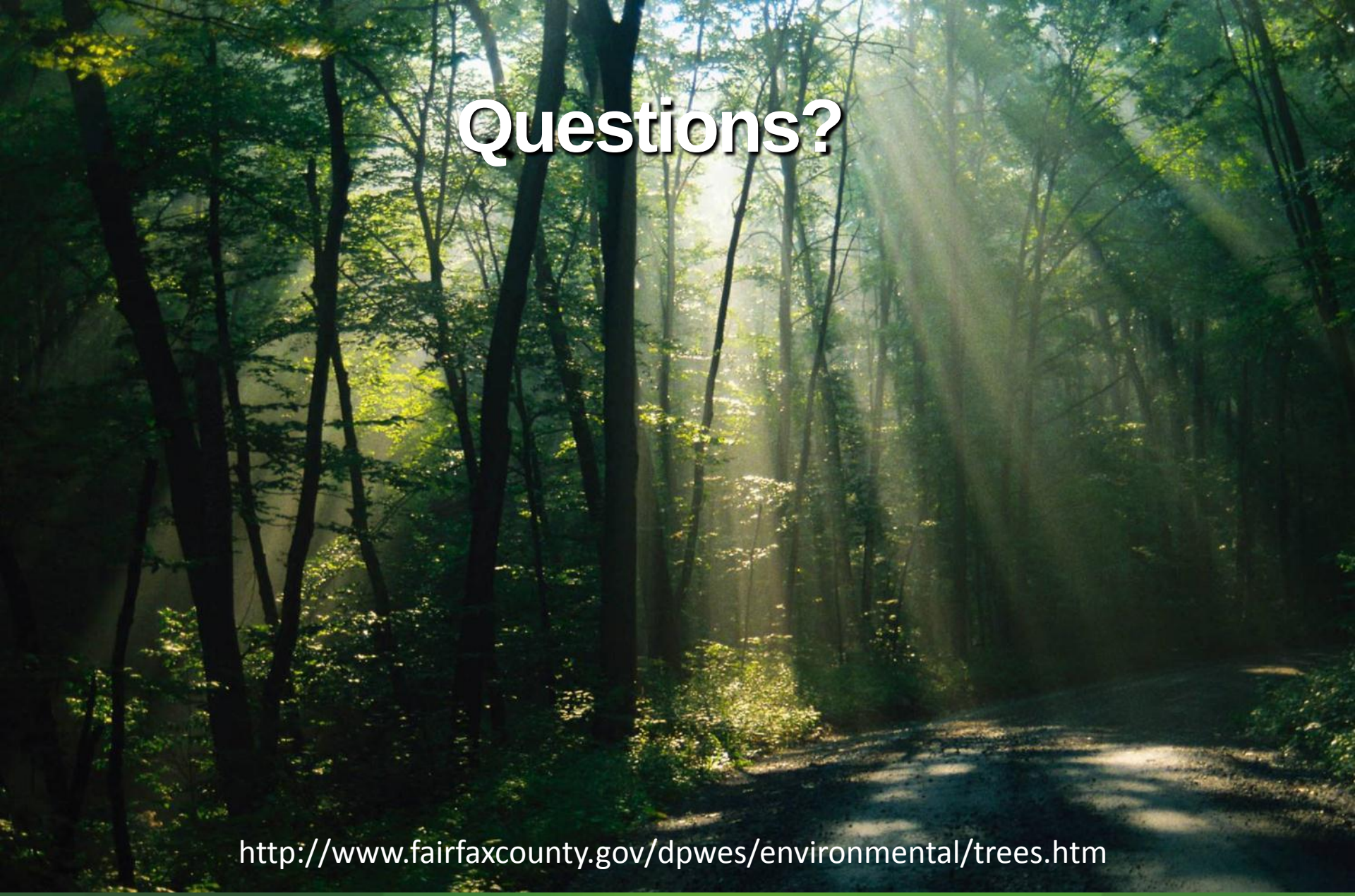
Chesapeake Bay Protection Ordinance



Resource Protection Areas

Chesapeake Bay Protection Ordinance

Tree Canopy



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