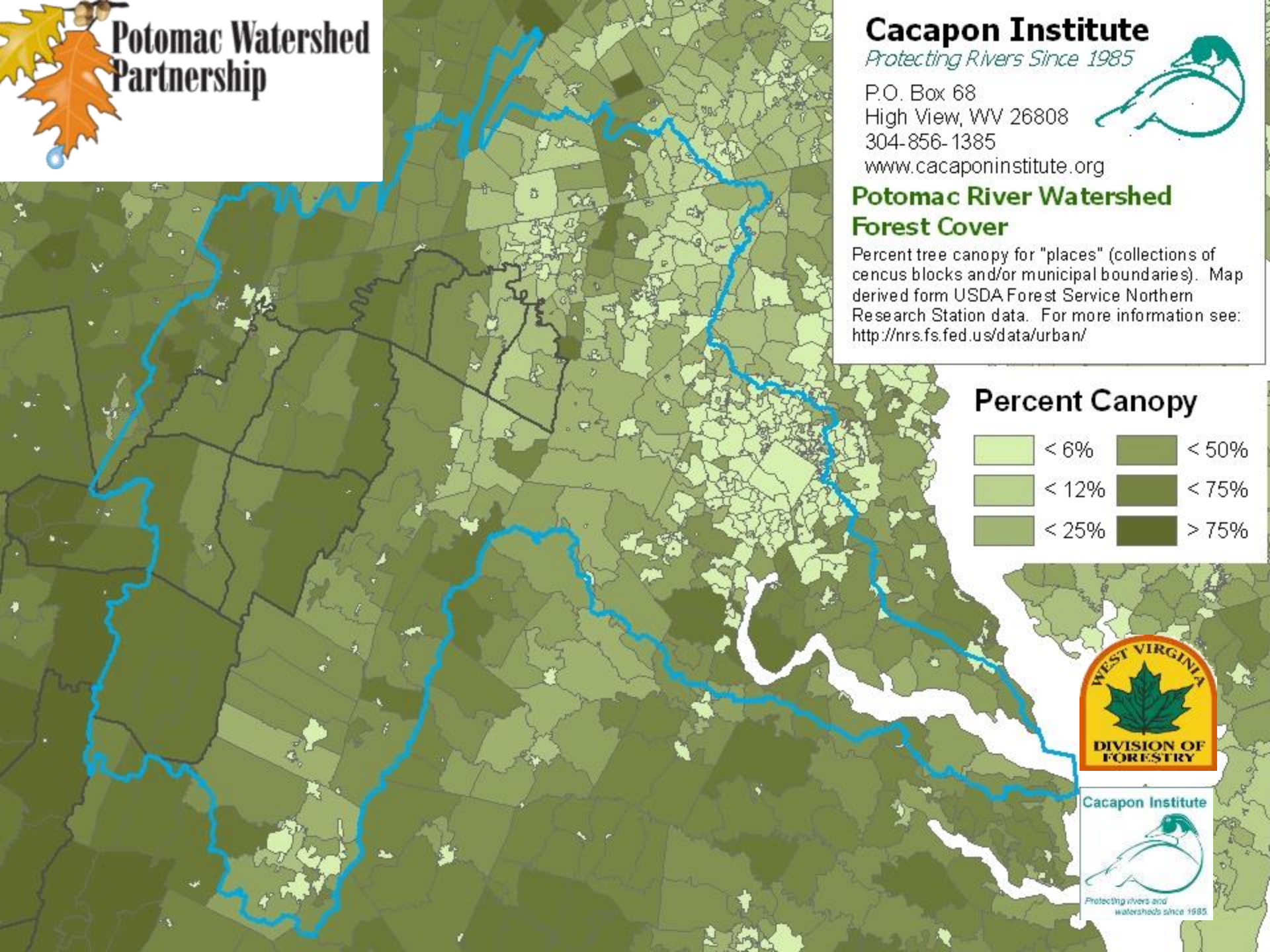
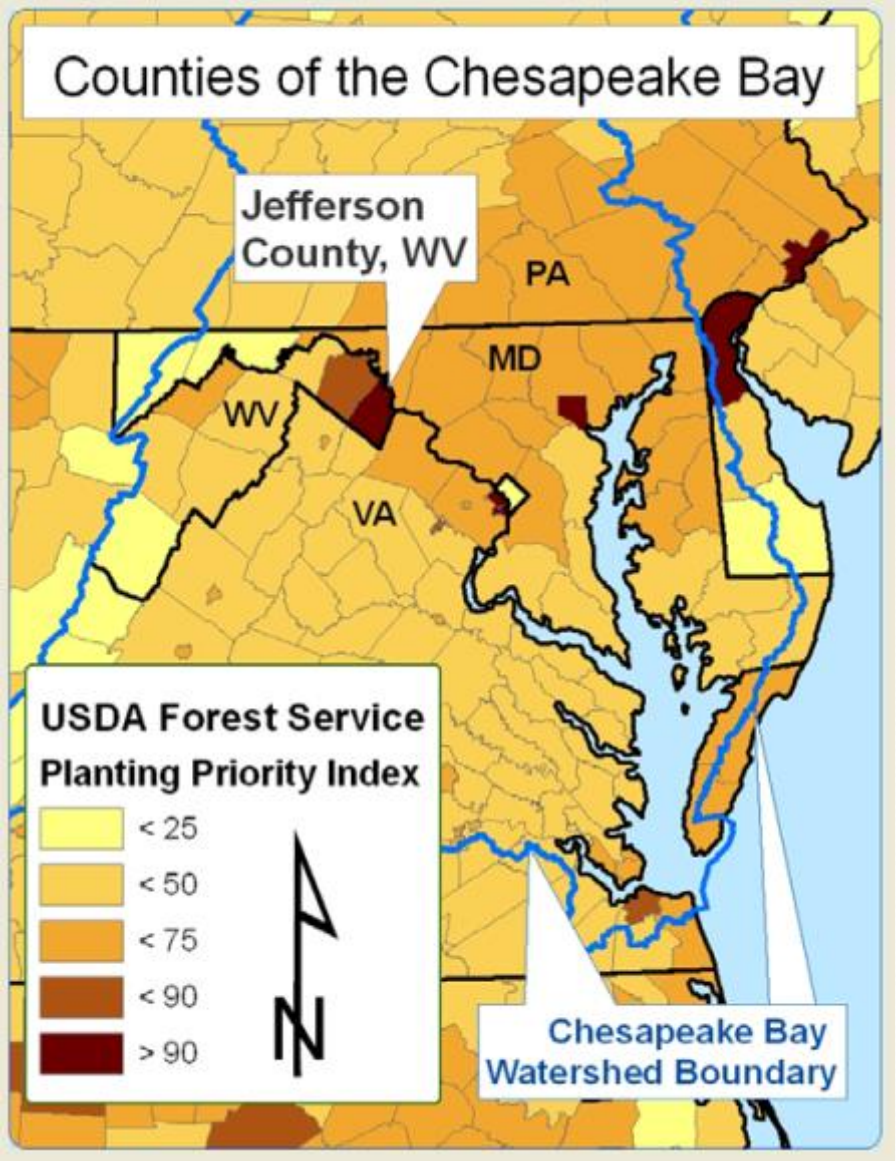
West Virginia
UTC Assessment & Enhancement
Bay UTC Summit 2014


Potomac Watershed Partnership
Cacapon Institute
Protecting Rivers Since 1985
P.O. Box 68
High View, WV 26808
304-856-1385
www.cacaponinstitute.org
Potomac River Watershed Forest Cover
Percent tree canopy for "places" (collections of cencus blocks and/or municipal boundaries). Map derived form USDA Forest Service Northern Research Station data. For more information see: http://nrs.fs.fed.us/data/urban/
Percent Canopy
< 6%
< 12%
< 25%
< 50%
< 75%
> 75%
WEST VIRGINIA
DIVISION OF FORESTRY
Cacapon Institute
Protecting rivers and watersheds since 1985

USDA Forest Service 2010 Priority Planting Index (PPI)

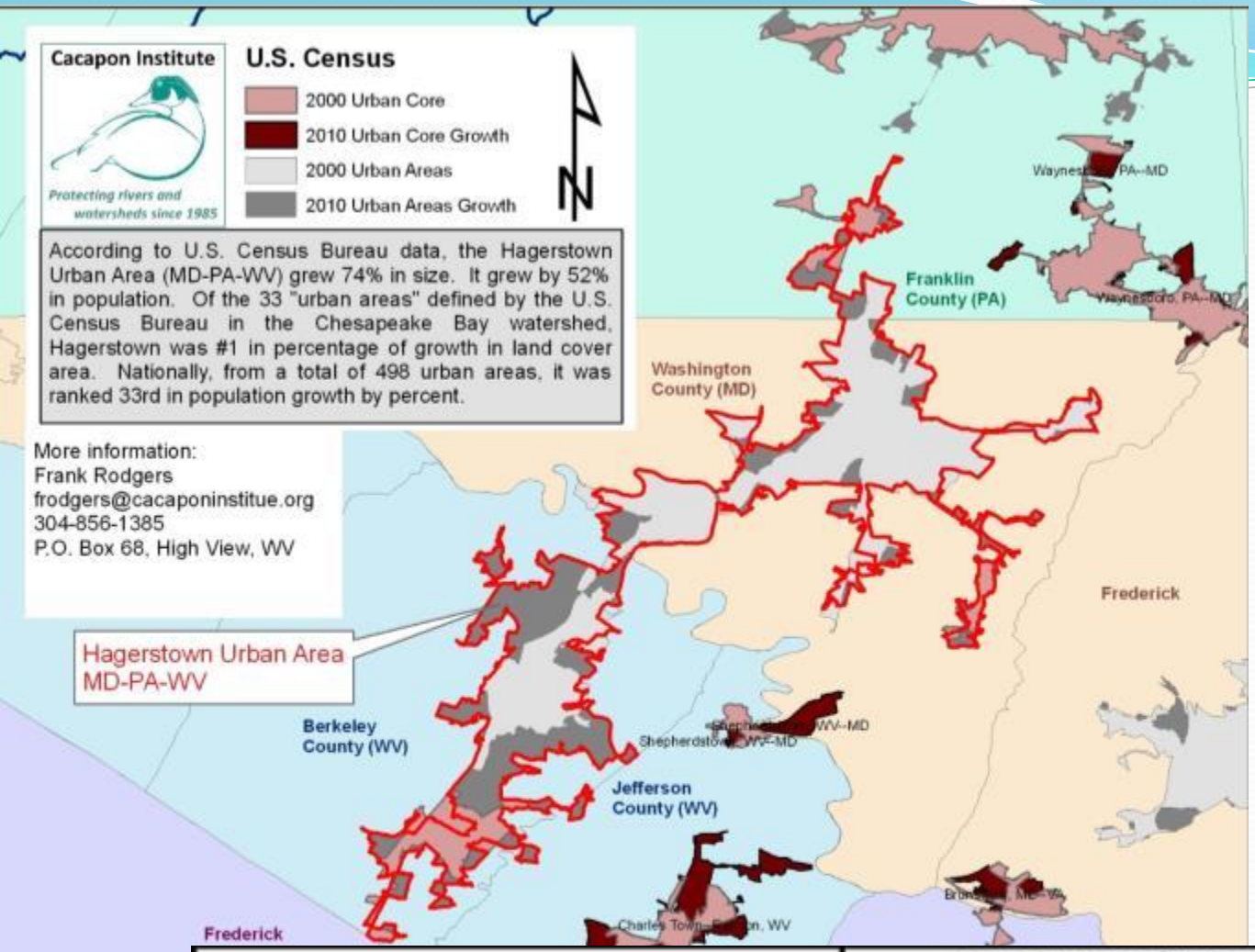


PPI Rankings

- **Berkeley = 87.5%**
- **Jefferson = 93.8%**

Based on:

- **Population density**
- **Canopy Green Space**
- **Tree Canopy Cover per Capita**



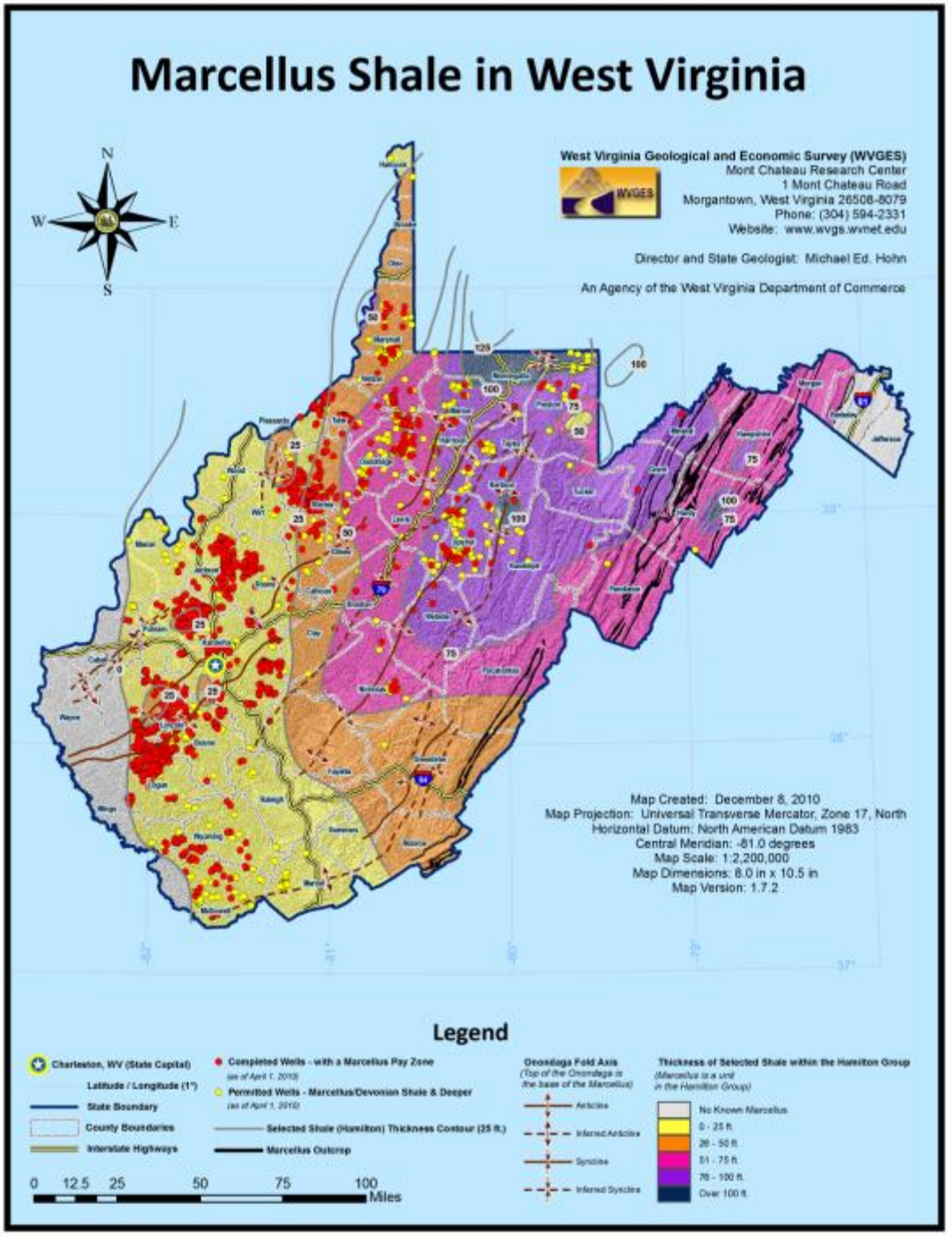
GROWTH
74% Land Area
52% Population

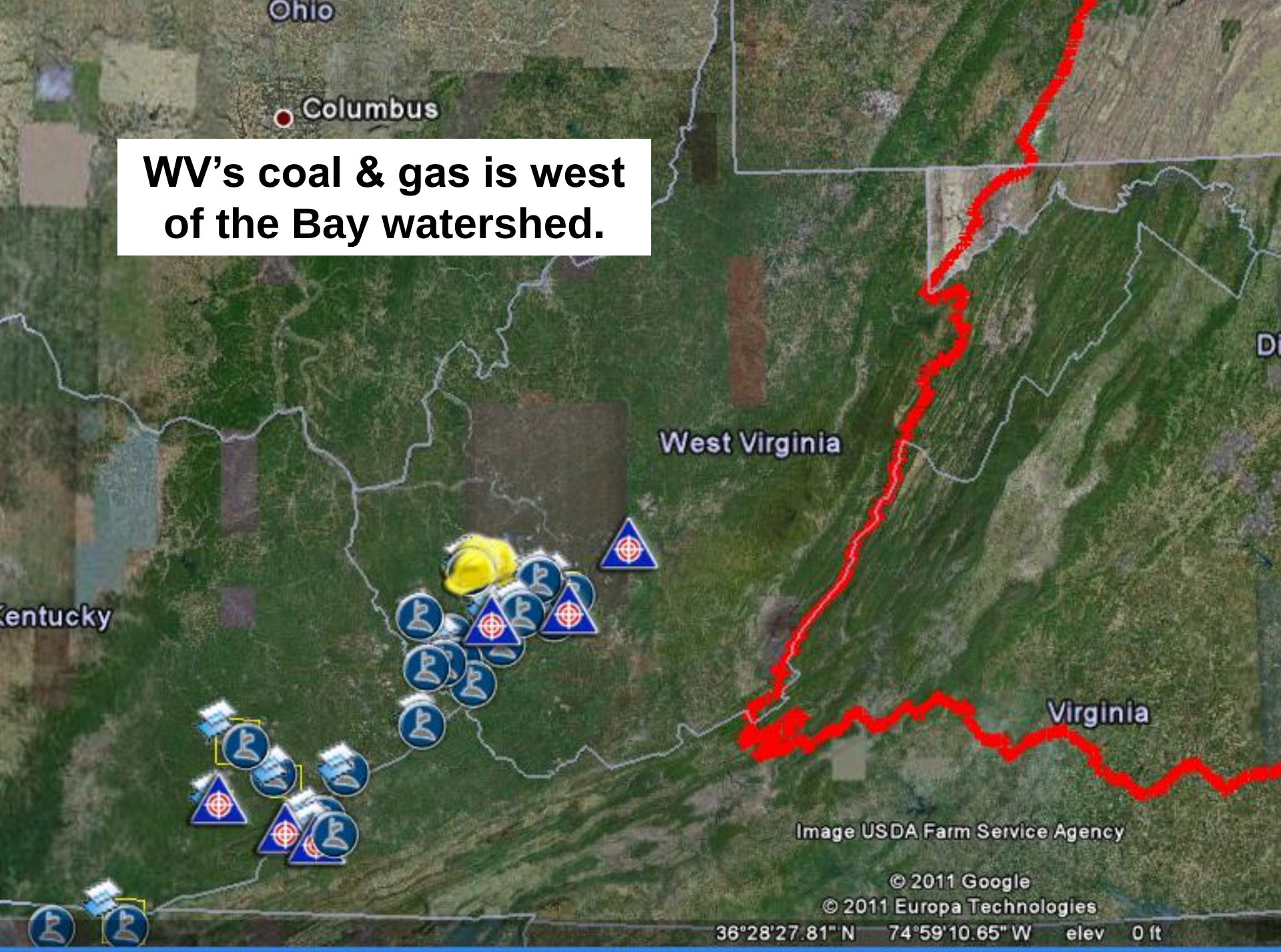
Urban Area Name	Land Area (Sq miles)				Pop	
	Percent Change	2010	2000	Change	Percent Change	2010
Hagerstown, MD--WV--PA	74	133	77	57	52	1826
Salisbury, MD--DE	65	71	43	28	65	980
Lebanon, PA	51	45	30	15	21	770
Waldorf, MD	47	68	46	22	47	1099
Lexington Park--California--Chesapeake Ranch Estates, MD	43	50	35	15	36	588

“The Chesapeake Bay watershed has lost forestland at a rate of 100 acres per day since the mid-1980s.”

State of the Chesapeake Forests
The Conservation Fund, 2006

WV's coal & gas is west of the Bay watershed.




Ohio
Columbus
WV's coal & gas is west of the Bay watershed.
West Virginia
Kentucky
Virginia
Image USDA Farm Service Agency
© 2011 Google
© 2011 Europa Technologies
36°28'27.81" N 74°59'10.65" W elev 0 ft

WV and the Bay. Up to 15% of nitrogen is from the west.

Jefferson Counties air is worse than Baltimore or D.C.’s air.

WV is a destination for the urban population to the east.
WEST VIRGINIA
DIVISION OF FORESTRY
Cacapon Institute
Protecting rivers and watersheds since 1985

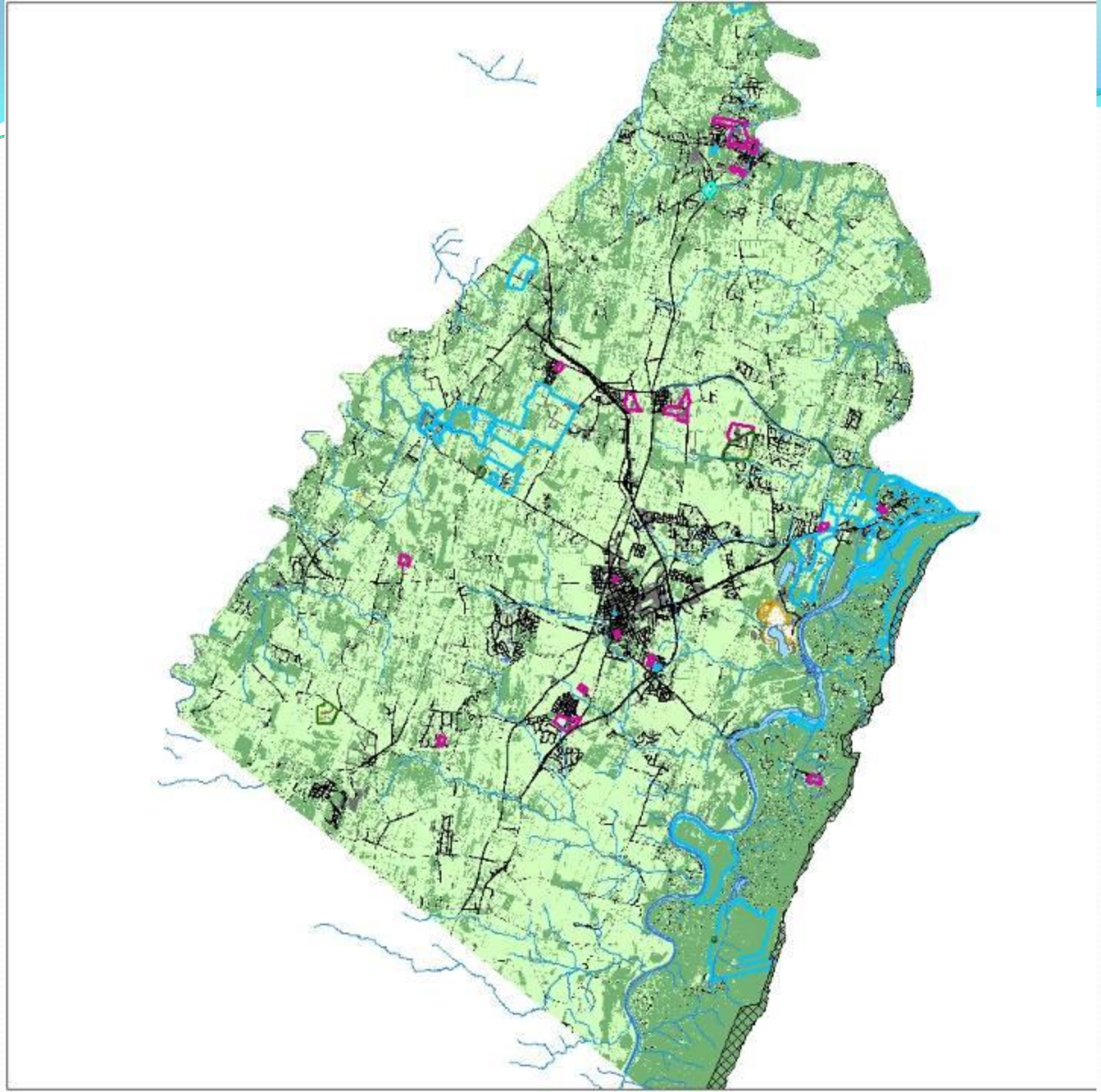
Urban Forestry in WV

ACCOMPLISHMENTS:

- **UTC Studies**
- **Plans & Goals**
- **i-Tree Street, Canopy & View in use**

STRATEGIES

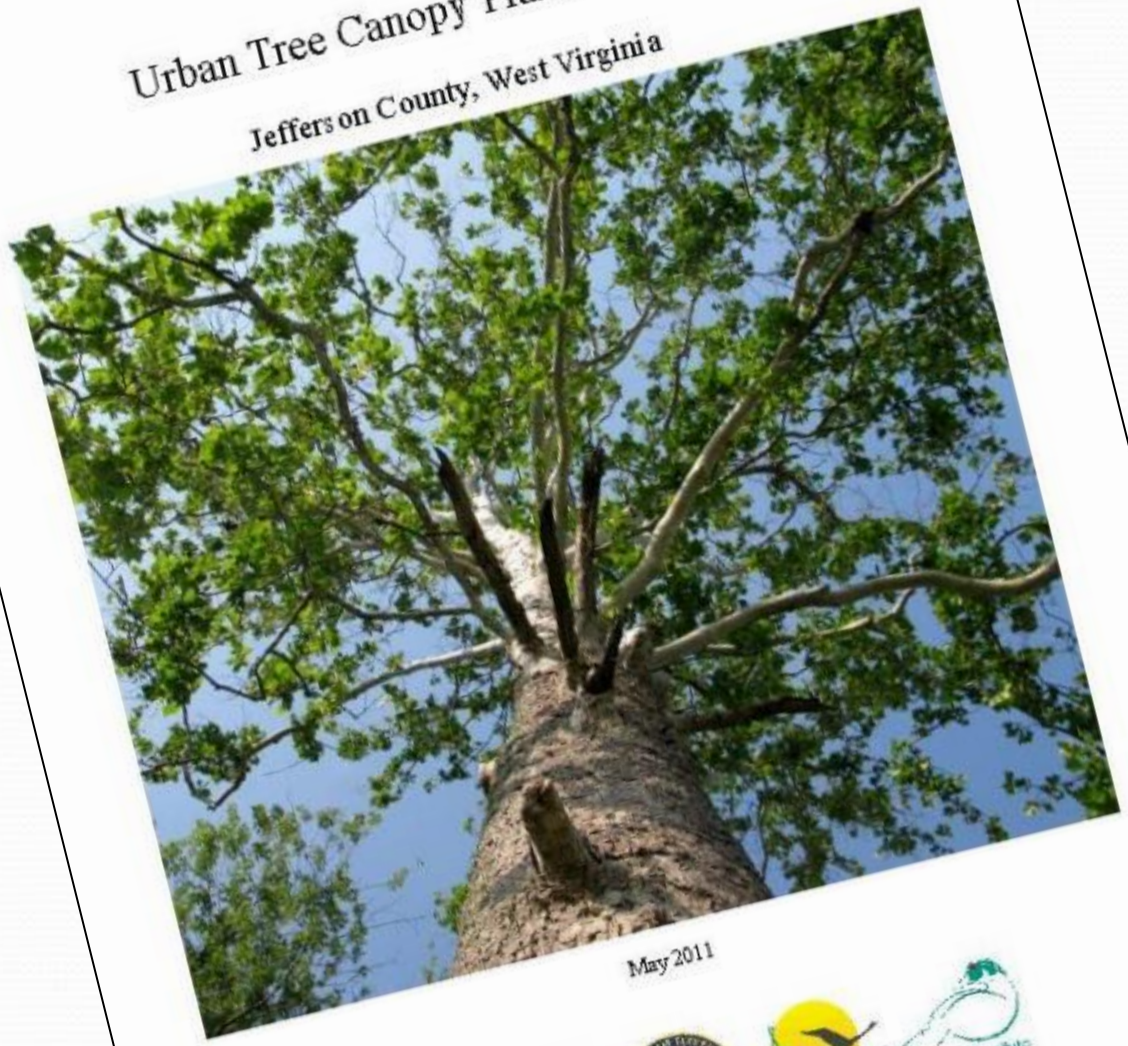
- **WV Bay Tree Grants**
- **WV Project CommuniTree**
- **PHLOW**
- **Community Environmental Management**



JEFFERSON

Urban Tree Canopy Plan and Goals

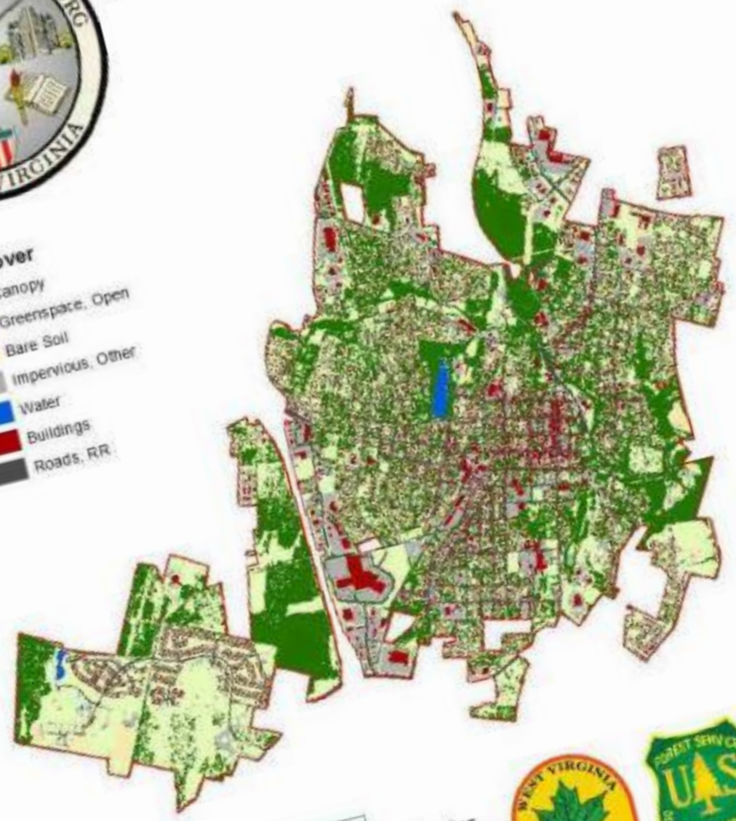
Jefferson County, West Virginia



May 2011

JEFFERSON

The City of Martinsburg
Urban Tree Canopy Analysis



Report Prepared By:

Cacapon Institute

Funding Provided By:

WEST VIRGINIA DIVISION OF FORESTRY

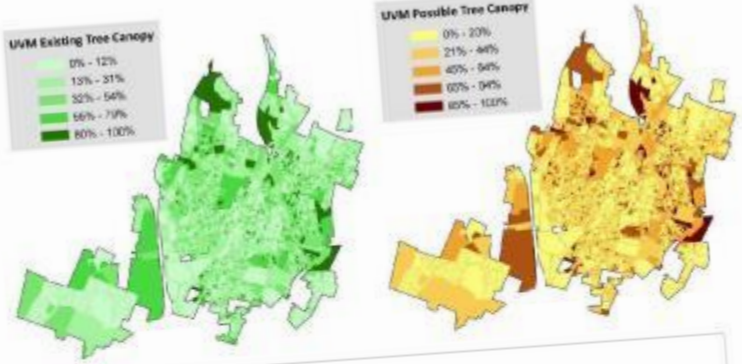
FOREST SERVICE US

January 2014

MARTINSBURG

When applied city-wide the UVM-USFS Possible Tree Canopy model converts all the green, soil, and impervious landcover to tree canopy without changing existing acres of water, building or road-railroad landcover types.

The UVM-USFS Existing and Possible Tree Canopy by parcel for Martinsburg.[6]



UVM "Possible Tree Canopy." One option.

[6] "A Report on Berkeley County's Existing and Possible Tree Canopy" [illegible] is available at the "Publication Tab" at www.cacaponinstitute.org

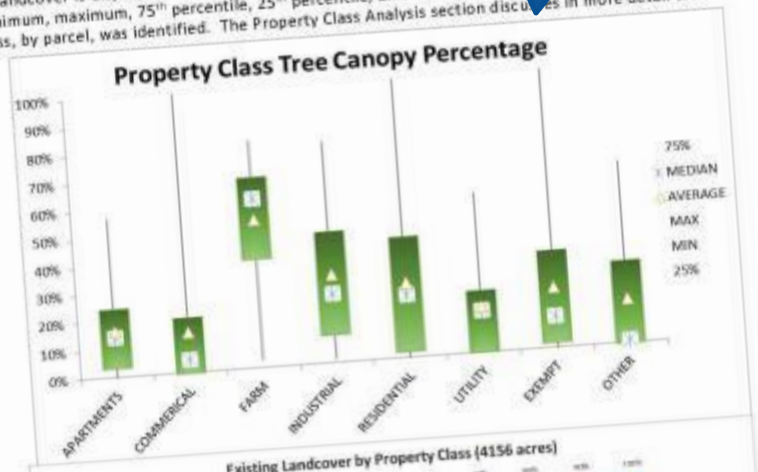
January 2014

Page 5

WV four options considered including "UTC Average"

Landuse and Landcover

There are 7,568 property parcels in Martinsburg in nine "property clas[illegible]nduse segmented by landcover is displayed in relative acres in a 100% stacked bar graph [illegible]roperty class. The minimum, maximum, 75th percentile, 25th percentile, and average tree c[illegible] for each property class, by parcel, was identified. The Property Class Analysis section discu[illegible]es in more detail the



landcover by each property class and discusses tree canopy on parcels in each property class based of the 100%, 60%, 40% and Average Hypothetical canopy. Landcover (canopy, green space, etc.) vis-à-vis landuse (apartment, commercial, farm, etc.) was analyzed. The majority of tree canopy is in the residential and farm property classes. The largest property class is residential, by acre and by number of parcels.

January 2014

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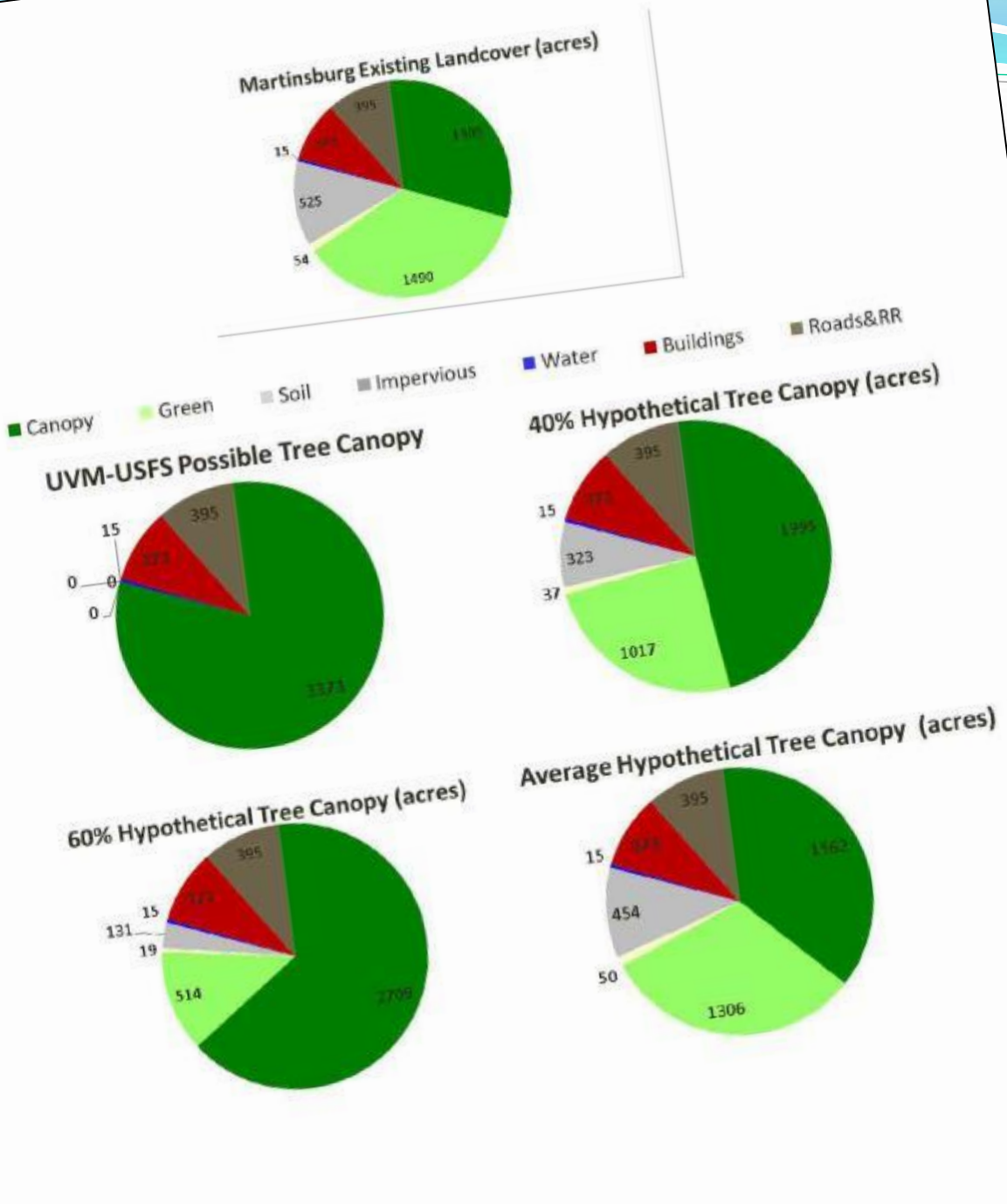


Martinsburg UTC
Five “options”

ETC - Existing
PTC – UVM Possible

Hypothetical TC

- **HTC60%**
- **HTC40%**
- **HTC Average**

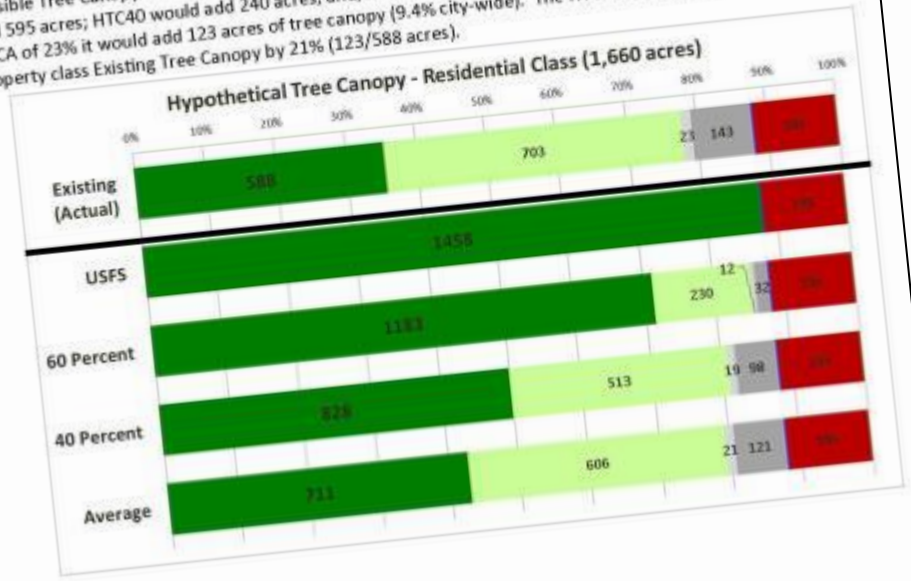
Residential Class Parcels

Analysis

Six thousand three hundred and ninety-eight (6,398) property parcels are classified as Residential. This represents 85% of all property parcels in Martinsburg (6398/7568 parcels). The class covers 40% of the city (1,660/4,156 acres). Statistics show:

Residential	Size (Acres)	Canopy Acres	Canopy Percent
MAX	119.66	56.14	100%
75%	0.24	0.08	44%
25%	0.10	0.00	2%
MEDIAN	0.16	0.03	23%
AVERAGE	0.26	0.09	27%
MIN	0.01	0.00	0%

Possible Tree Canopy with full conversion of suitable landcover would add 870 acres of canopy; HTC60 would add 595 acres; HTC40 would add 240 acres; and, if all residential class properties with the potential to reach the HTCA of 23% it would add 123 acres of tree canopy (9.4% city-wide). The HTCA would increase residential property class Existing Tree Canopy by 21% (123/588 acres).



January 2014

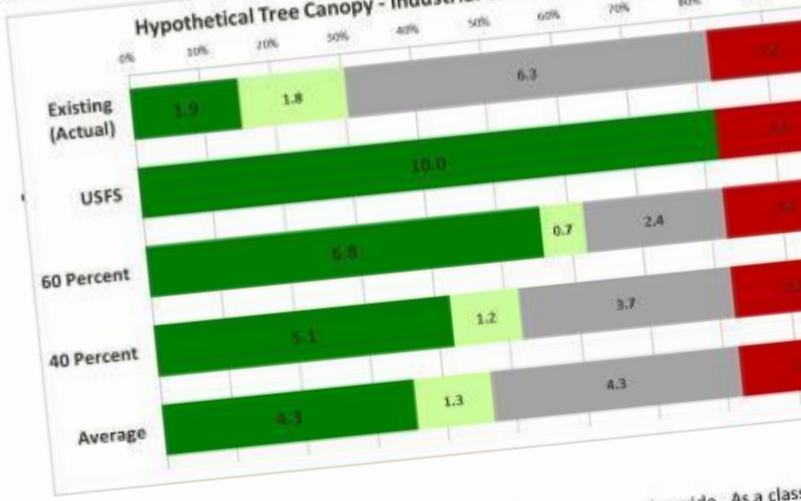
Industrial Class Parcels

Analysis

Nine (9) property parcels are classified as Industrial. This represents 0.1% of all property parcels in Martinsb (9/7568 parcels). The class covers 0.3% of the city (12/4,156 acres). Statistics show:

Industrial	Size (Acres)	Canopy Acres	Canopy Percent
MAX	7.78	0.78	79%
75%	1.18	0.23	47%
25%	0.12	0.02	10%
MEDIAN	0.24	0.06	25%
AVERAGE	1.35	0.21	32%
MIN	0.07	0.00	2%

Possible Tree Canopy with full conversion of suitable landcover would add 8.1 acres of canopy; HTC60 w add 4.9 acres; HTC40 would add 3.2 acres; and, if all industrial class properties reached HTCA of 25% it w add 2.4 acres of tree canopy (0.18% city-wide). The HTCA would increase industrial class Existing Tree C by 126% (2.4/1.9 acres).



Conclusion

As a property class Industrial has an insignificant impact on the tree canopy city-wide. As a class Industrial has the highest potential rate of canopy increase. The USDA Forest Service Possible T full conversion of suitable land is a 226% increase (4.3 Possible / 1.9 Existing). Even an increase than doubles the Existing Tree Canopy. Given the importance trees can play in improving lands visual screens and for noise reduction, trees might be incorporated into industrial parcels to be surrounding neighborhoods. Given the small overall landuse in acres, and the small number o additional detailed investigation could lead to quick benefits.

Martinsburg
i-Tree Streets

i-Tree Streets Inventory
The City of Martinsburg

What is i-Tree Streets?

The City of Martinsburg worked with the Martinsburg Shade Tree Commission to conduct an i-Tree Streets ("i-Tree") inventory of trees in the public right of way. Martinsburg appreciates the technical support provided by Cacapon Institute and the WV Division of Forestry in conducting the survey and drafting this report. i-Tree Streets is a USDA Forest Service assessment tool used to gauge the "ecosystem services and structure of a city's street tree population." Based on a random sample of street segments and user defined input i-Tree estimates a value on trees' annual environmental and aesthetic benefits.

Purpose

Street trees provide a variety of functions and play a crucial role in creating healthy, vibrant communities. Street trees provide shade and wind protection for pedestrians, clean the air and water, lower ambient air temperatures, reduce the urban heat island effect, beautify neighborhoods, and increase property values.

The purpose of the i-Tree inventory was to assess the **structure, function, value, and management needs** of Martinsburg's street trees.

- **Structure**: The species composition and size distribution assists City officials in anticipating future planting opportunities and the potential for engaging the community in education and action.
- **Function**: i-Tree analyzes the ecosystem services, i.e., the function, the urban forest is providing. Functions include energy conservation, air quality improvement, stormwater management, and carbon dioxide reduction, among others.
- **Value**: i-Tree quantifies the environmental and other benefits that the urban forest is providing, both in unit terms (e.g., kilowatt hours of electricity conserved) and in dollar terms. Based on historic management costs, i-Tree can determine the return on investment that the trees are providing. This assists City officials in developing cost-effective street tree management programs.
- **Management Needs**: Based on tree condition data collected in the random sample, i-Tree forecasts maintenance requirements and priority tasks based on infrastructure conflicts to help City officials effectively resolve community street trees.

Crabapple tree in planting strip on Martin Street

Project Development

The City of Martinsburg has a total of 715 street segments (blocks or portions of roads and drives). To maximize the cost benefit, the inventory focused on municipally controlled streets. Segments less than 50 feet in length were excluded (e.g. alleys and driveways). This resulted in a total of 413 street segments under investigation. To achieve a high degree of statistical confidence in the results, 10% of these street segments were randomly selected (this exceeds the 6% recommended by the USDA Forest Service for similar municipalities). Based on the 10% sample, results were extrapolated in i-Tree to estimate the total City owned street tree population. A total of 6 miles of street segments were inventoried.

City of Martinsburg outlined in white with the 42 randomly selected street segments highlighted in red.

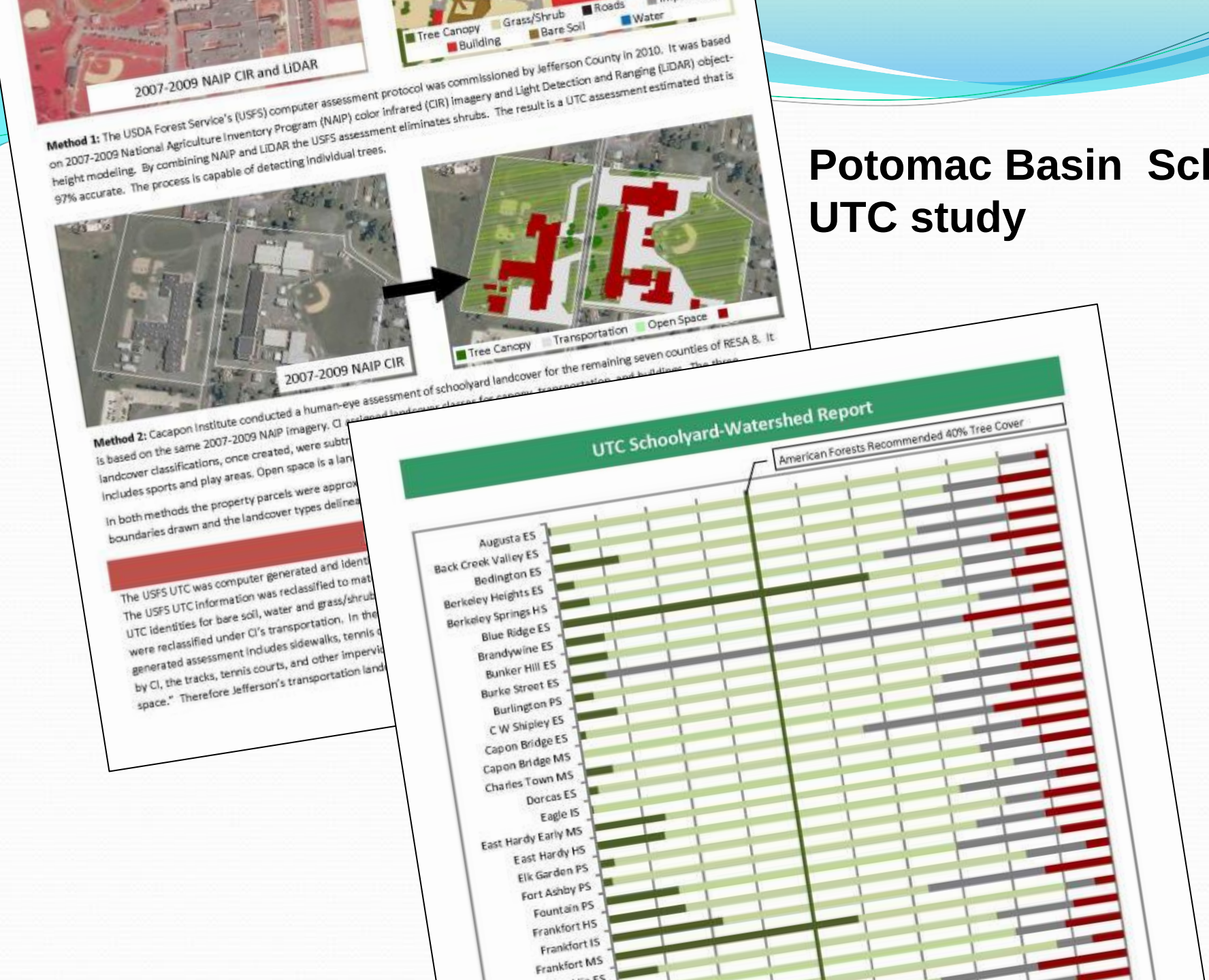
Key Terms

Street Tree—Defined as any tree that is located in between the road and the sidewalk OR any tree that has a canopy which extends beyond the centerline of road

Tree Canopy—Tree Canopy is the layer of leaves, branches, and stems of trees that cover the ground when viewed from above.

i-Tree Software Suite—a state-of-the-art, peer-reviewed software suite from the USDA Forest Service that provides urban forestry analysis and benefits assessment tools.

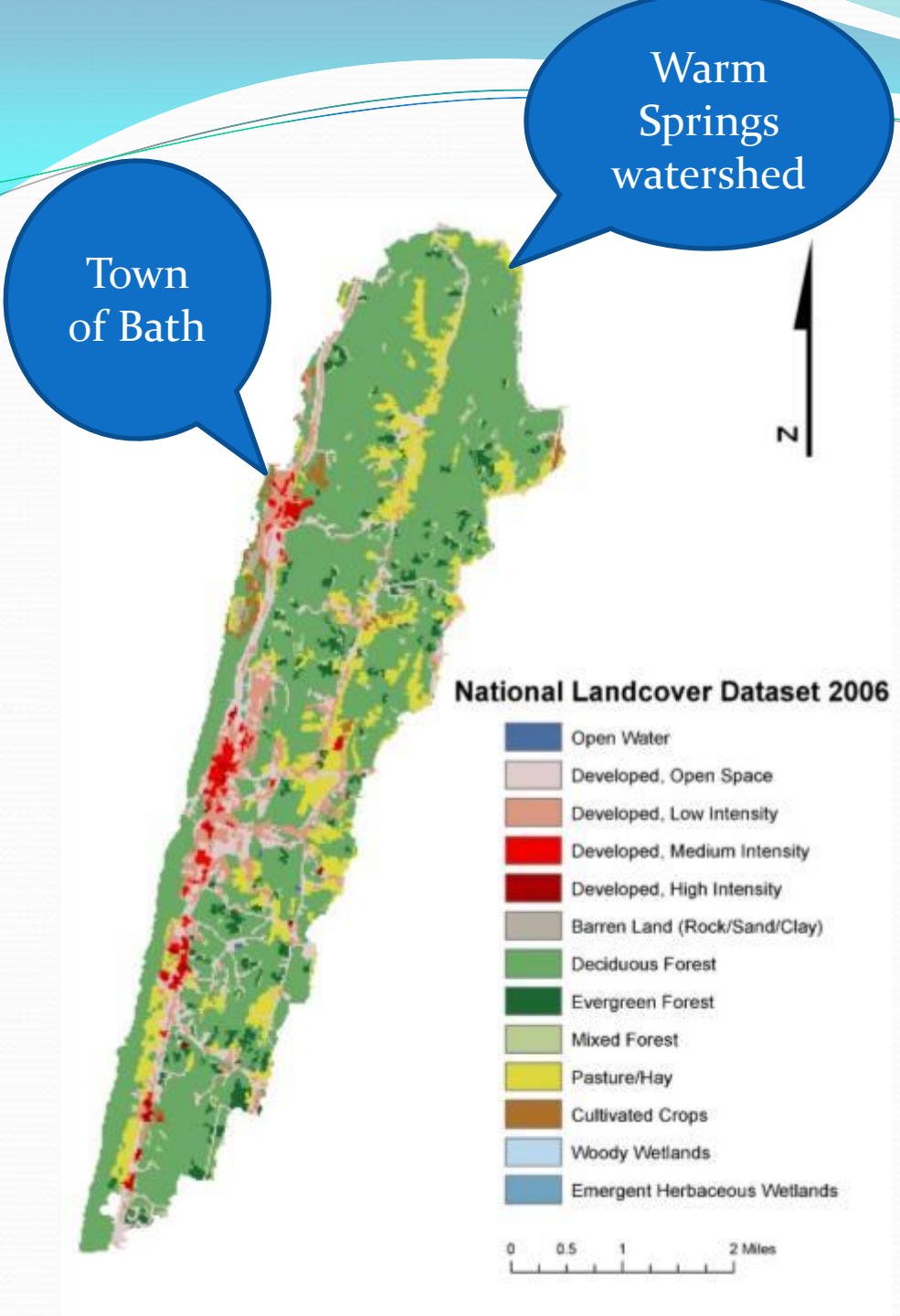
Potomac Basin School UTC study



Urban Forestry in WV

STRATEGIES

- **WV Bay Tree Grants**
- **WV Project CommuniTree**
- **Community Environmental Management**
- **PHLOW**

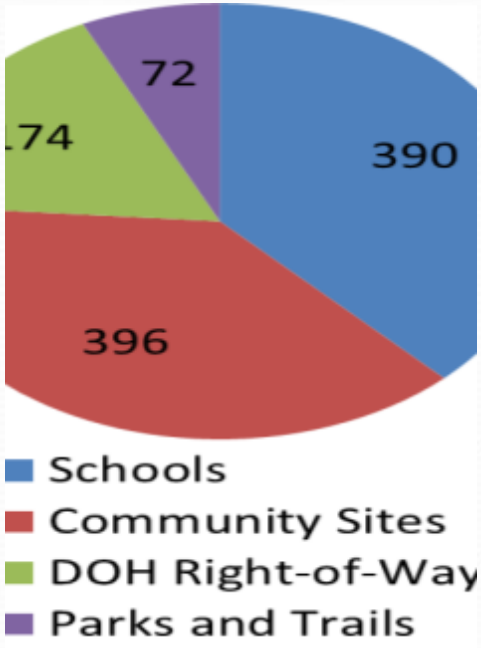


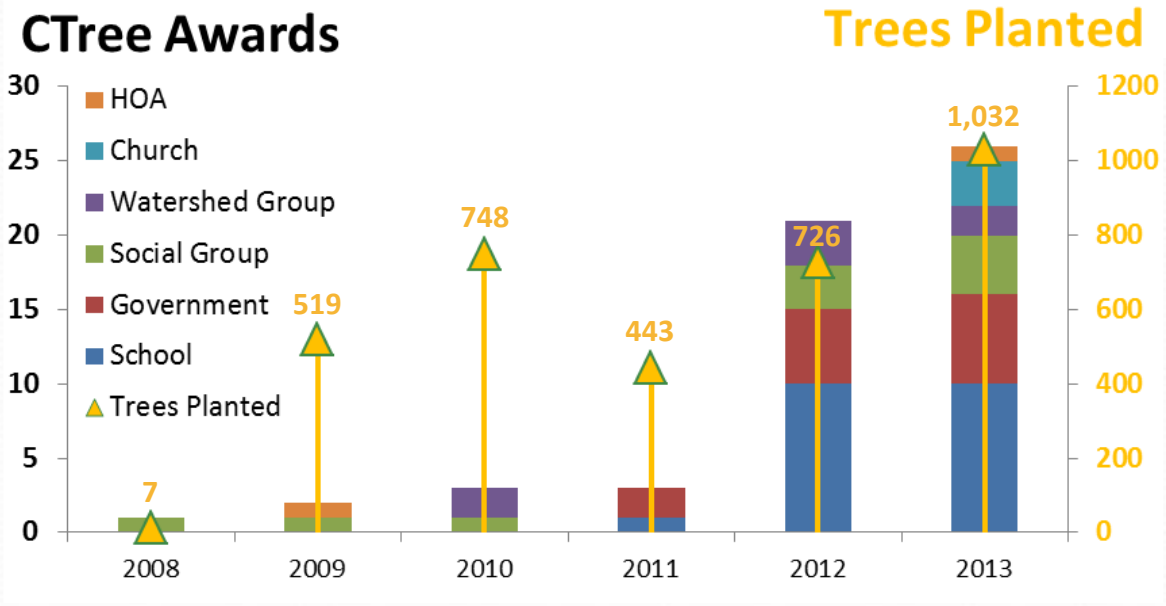
Bay Trees Grants

- **UTC analysis**
- **Technical assistance with plans & goals**
- **Demonstration tree plantings**

Bay Trees take a holistic view of urban-suburban communities and their watersheds.

Trees Planted 2013





Potomac Headwaters

PHLOW

Leaders Of Watersheds

Cacapon Institute

Potomac Headwaters

PHLOW

Leaders Of Watersheds

Cacapon Institute

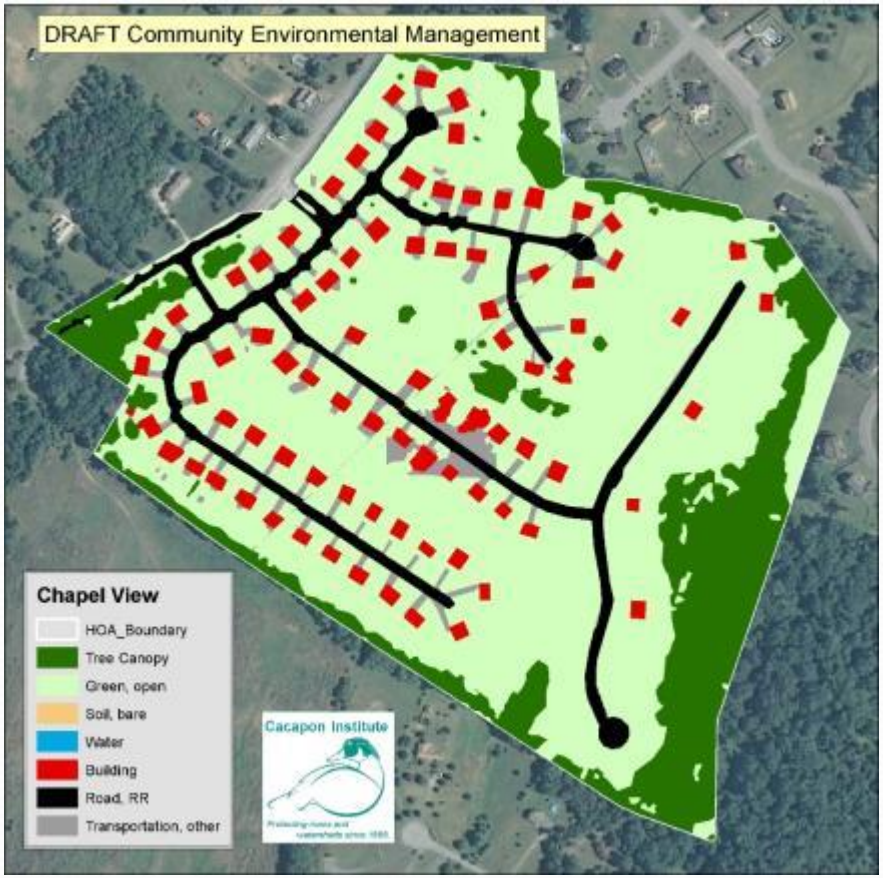
Community Environmental Management (CEM)

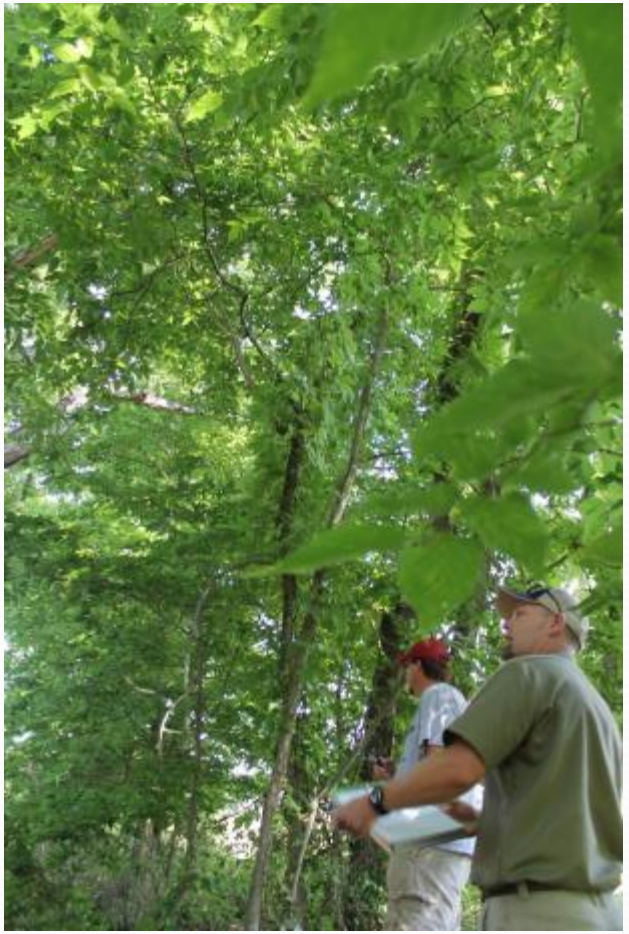
Partnership of the WV Chesapeake Bay Tributary Team

CEM Focuses on Mitigating NPS stormwater runoff pollution

- **Green infrastructure**
  - **tree plantings**
  - **rain gardens**
  - **rain barrels**
  - **bio-swales**
  - **improve the health of streams & watersheds**

UTC and forestry management





West Virginia

UTC Assessment & Enhancement

Bay UTC Summit 2014

WV DOF: Robert Hannah, Urban Forestry Coordinator
Herb Peddicord, Chesapeake Bay Forester

Trees 101: Shawn Walker

Cacapon Institute: Tanner Haid, Urban Watershed Forester
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304-240-2721

Chesapeake Bay Program
Science. Restoration. Partnership.

FOREST SERVICE U.S. DEPARTMENT OF AGRICULTURE

WEST VIRGINIA DIVISION OF FORESTRY

Cacapon Institute
Protecting rivers and watersheds since 1985