FROM THE CACAPON TO THE POTOMAC TO THE CHESAPEAKE BAY, WE PROTECT RIVERS AND WATERSHEDS USING SCIENCE AND EDUCATION

FRANK F. RODGERS

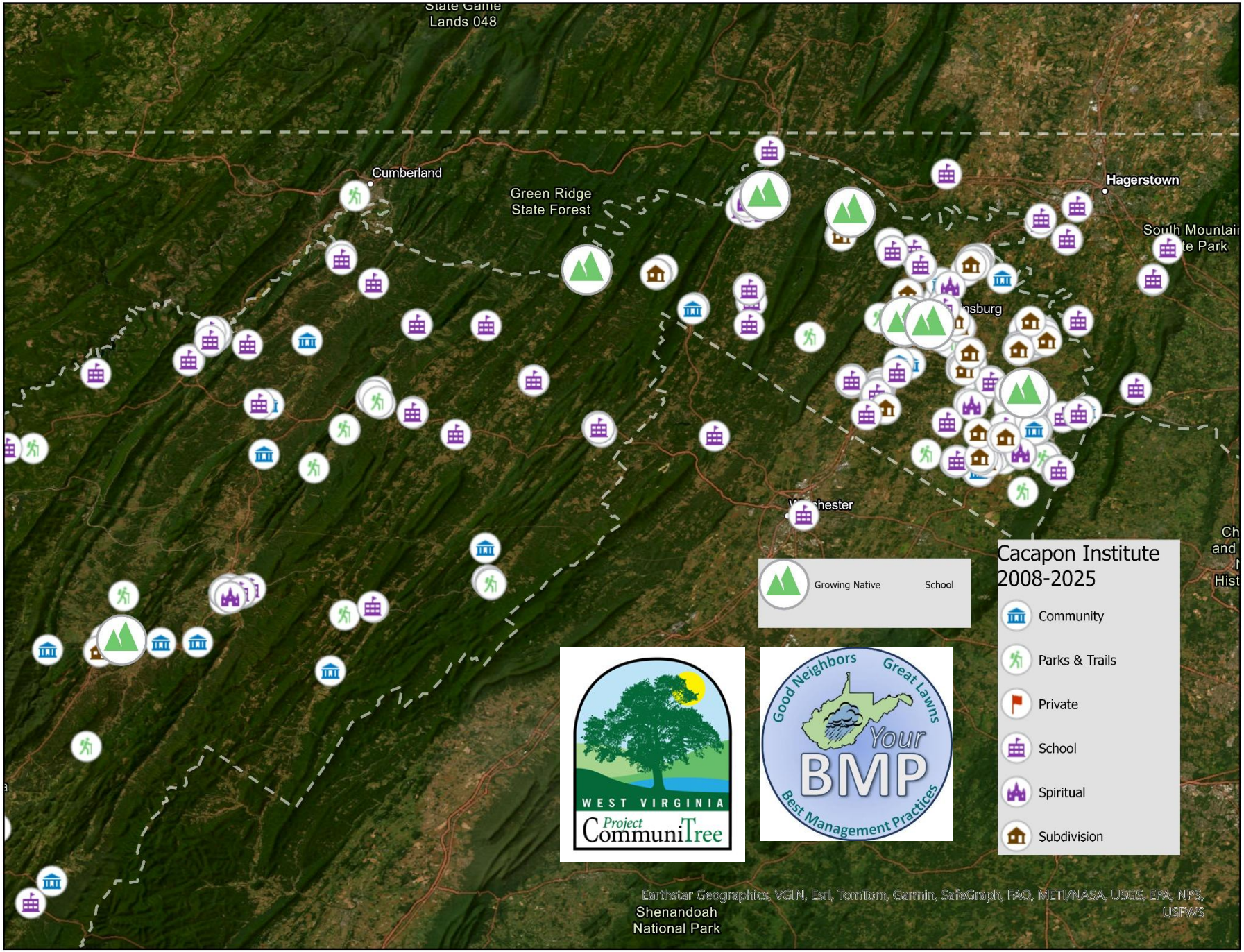
EXECUTIVE DIRECTOR

CACAPON INSTITUTE

ISA CERTIFIED ARBORIST #MA-4468A

Cacapon Institute

Protecting rivers and watersheds since 1985.


State Game Lands 048
Cumberland
Green Ridge State Forest
Hagerstown
South Mountain State Park
Winchester
Growing Native
School
Cacapon Institute 2008-2025
Community
Parks & Trails
Private
School
Spiritual
Subdivision
WEST VIRGINIA Project CommuniTree
Good Neighbors Great Lawns Your BMP Best Management Practices
Earthstar Geographics, VGIN, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS
Shenandoah National Park

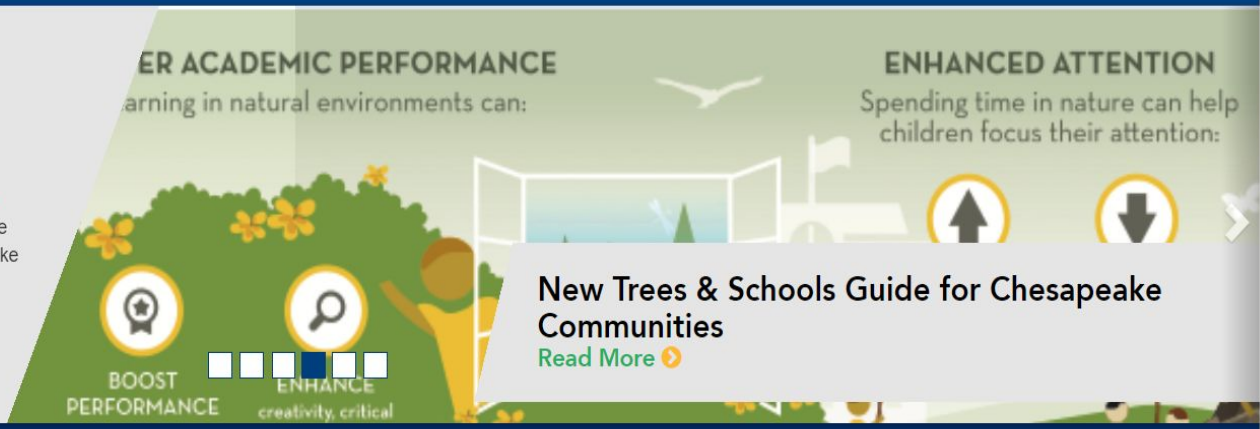
Chesapeake Tree Canopy Network

SIGN UP | NEWSLETTER ARCHIVE | ABOUT US | CONTACT US | CHESAPEAKEFORESTBUFFERS.NET

WHY TREE CANOPY? | UNDERSTAND YOUR CANOPY | EXPAND YOUR CANOPY | MAINTAIN YOUR CANOPY | MAINTAIN YOUR CANOPY

Welcome to the Chesapeake Tree Canopy Network

Connecting you with resources, stories, and best practices to understand your canopy, expand your canopy, and maintain your canopy. Learn about and make the case to others why tree canopy is so critical to a healthy, vibrant Chesapeake Bay watershed. We are building this resource as we go, so please send your ideas and suggestions for making the network most helpful.

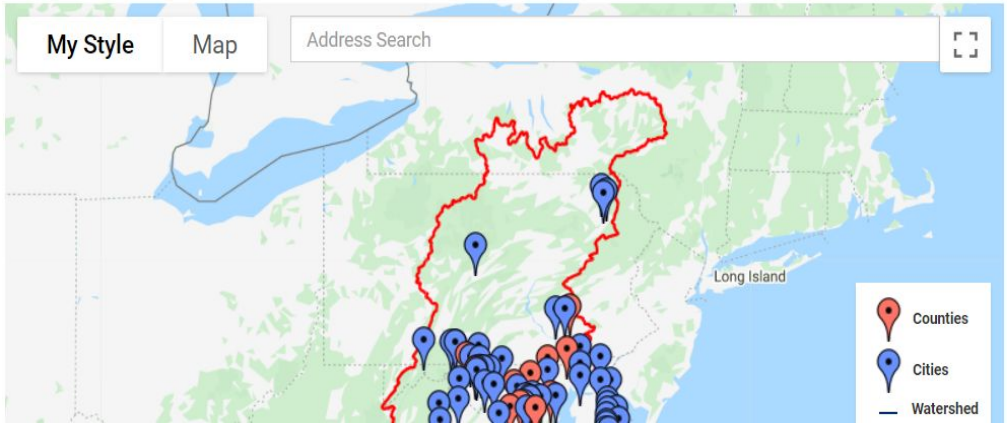


New Trees & Schools Guide for Chesapeake Communities
Read More

Get updates on tree canopy news and events! SIGN UP | NEWSLETTER ARCHIVES

Tree Canopy Initiatives

Find local tree canopy assessments, goals, and urban forestry contacts.



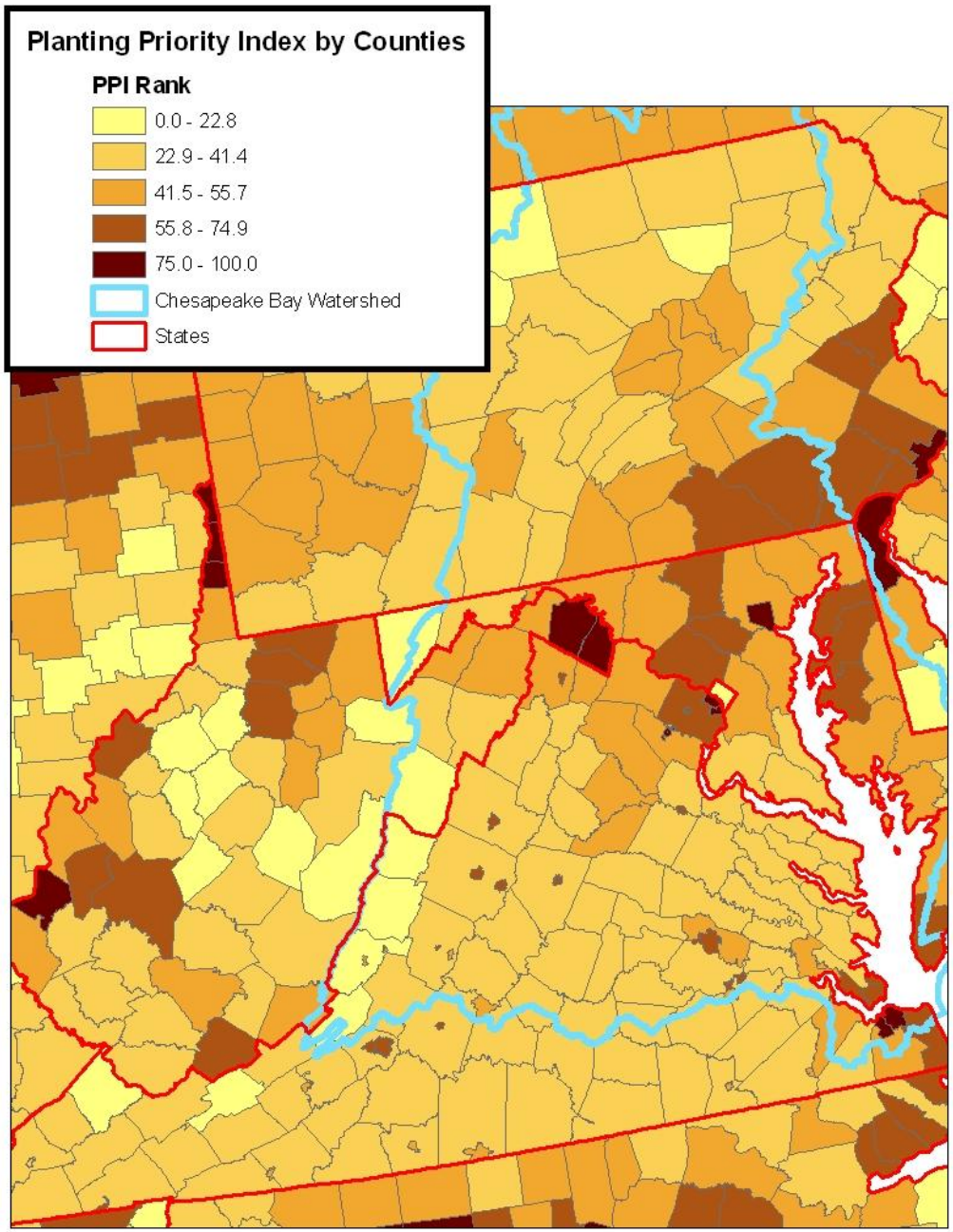
chesapeake network

Looking to participate in the tree canopy conversation? Join our group on the Chesapeake Network. Need help joining, posting, or have questions? Check out our help guide (PDF).

Privacy - Terms

Schoolyard forestry is the height of urban & community forestry

Urban Forestry is the care of the trees we live with, the trees that grace our cities and towns, schools, parks, roadsides, and neighborhoods.



Why urban forestry for WV?

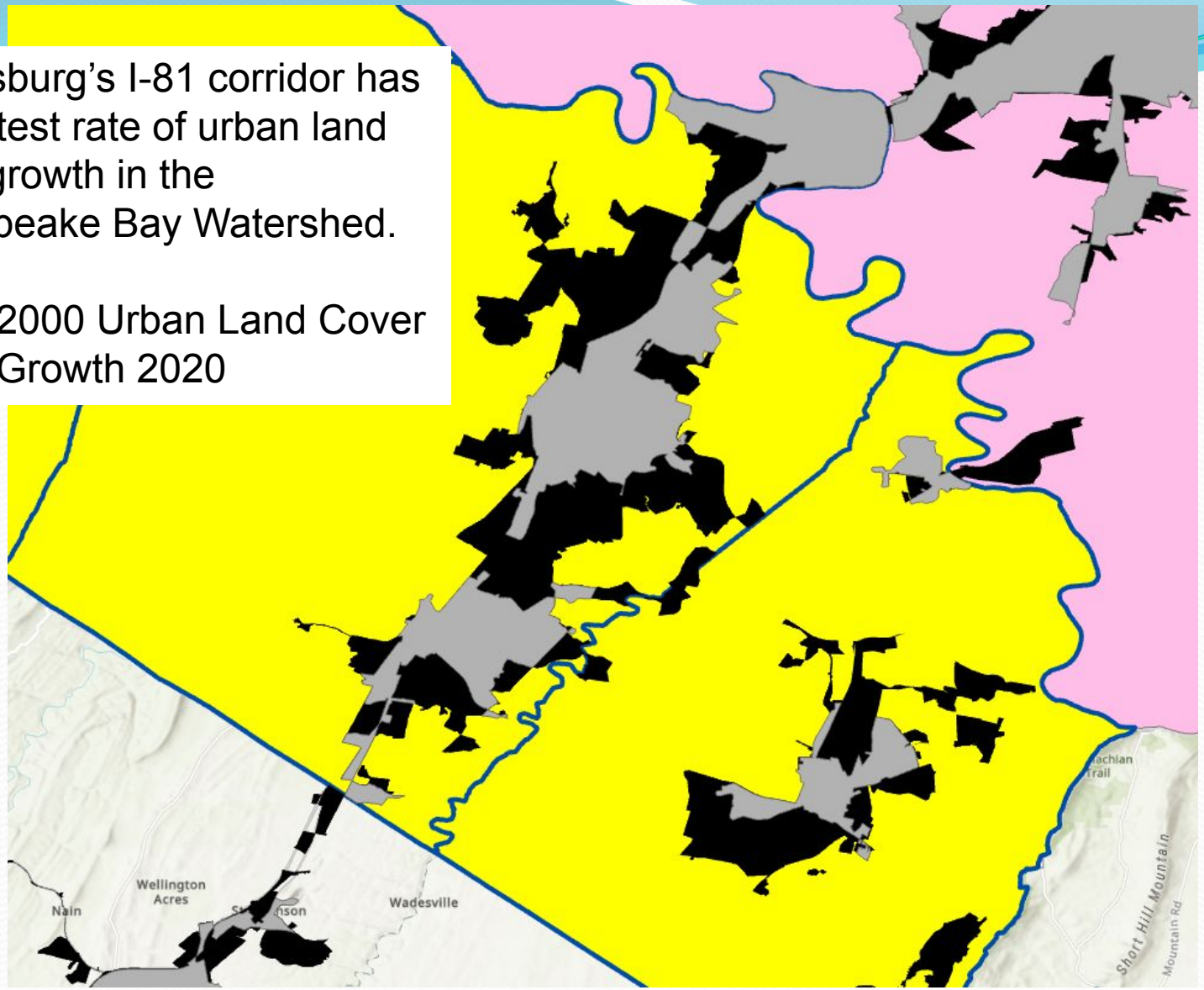
USDA Forest Service's Planting Priority Index (Nowak, 2000)

Identified, and ranked, areas of low canopy and growing population.

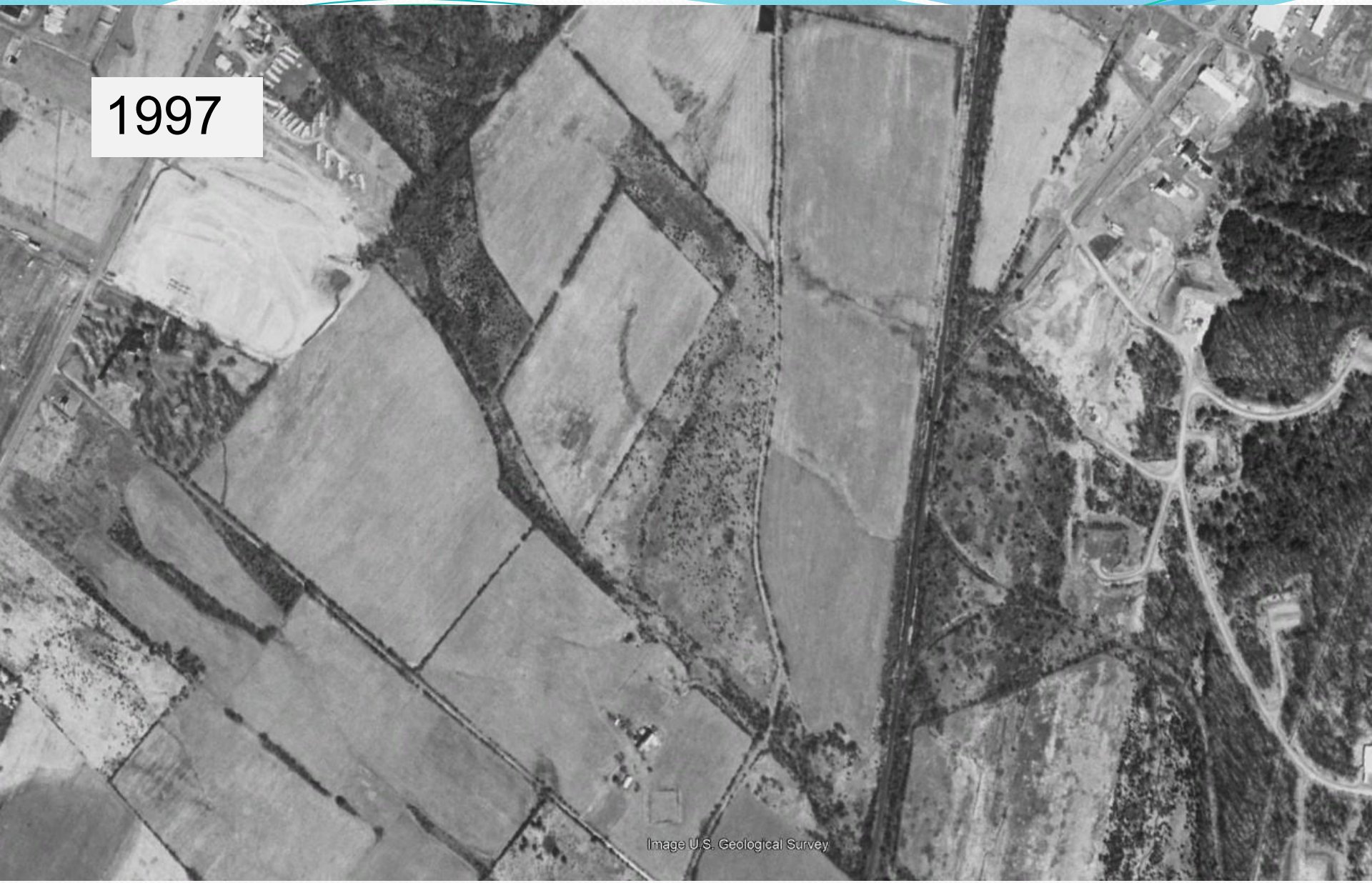
See how the E. Panhandle has a high PPI scores due to canopy loss and population growth.

Martinsburg's I-81 corridor has the fastest rate of urban land cover growth in the Chesapeake Bay Watershed.

Gray: 2000 Urban Land Cover
Black: Growth 2020



What does 73% rate of growth look like?


1997
Image U.S. Geological Survey

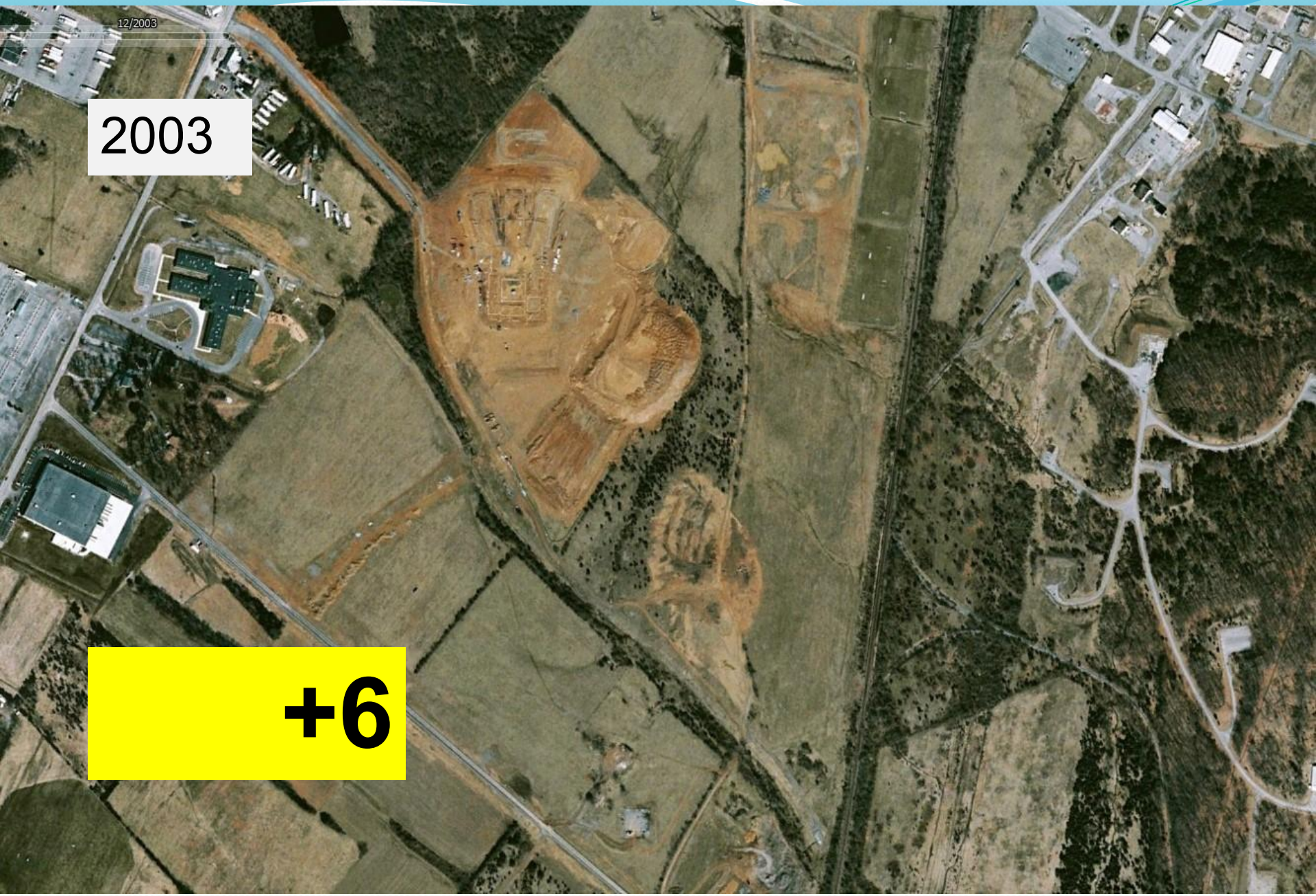
12/2003
2003

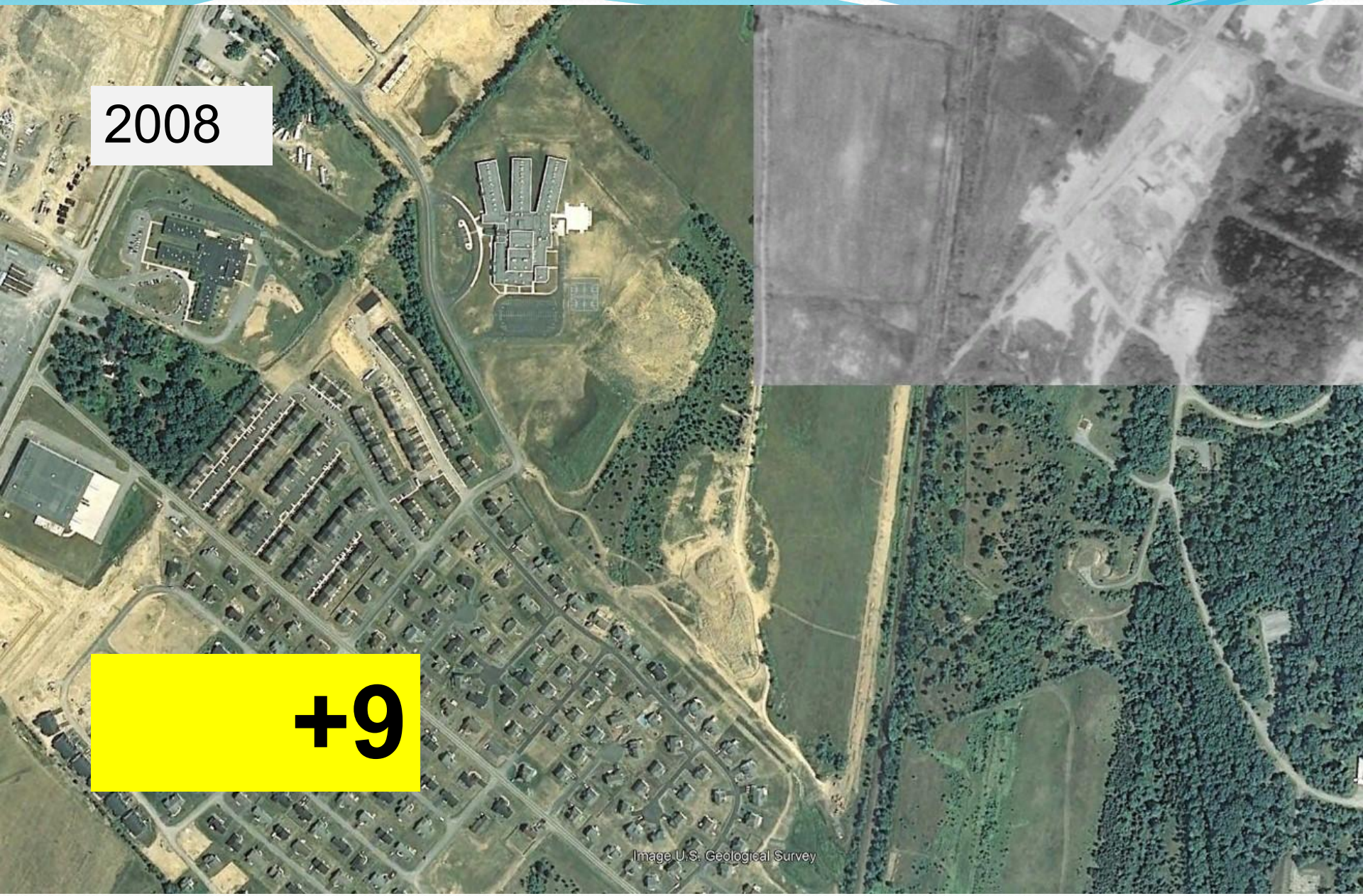
2008
Image U.S. Geological Survey

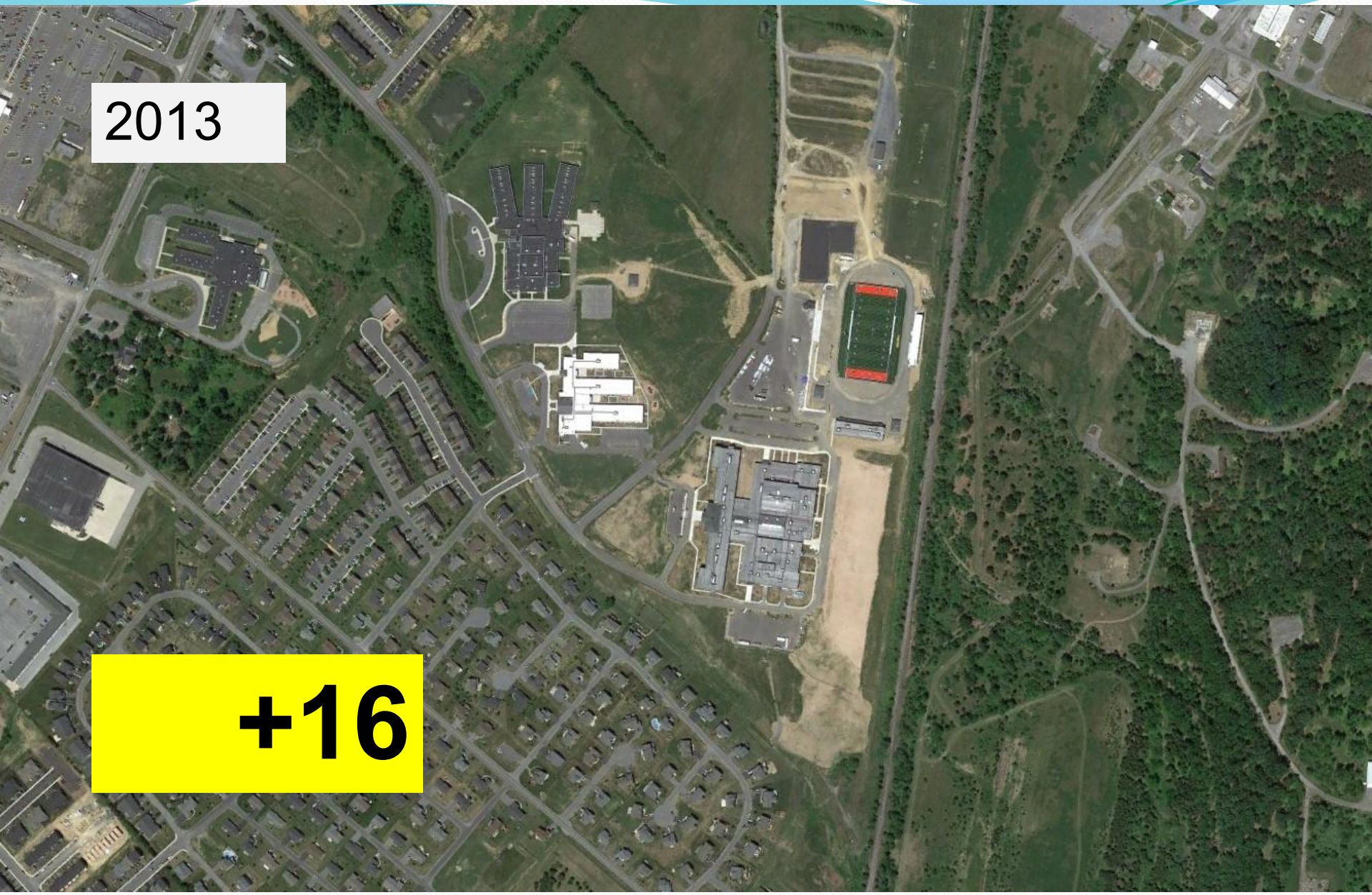
2013

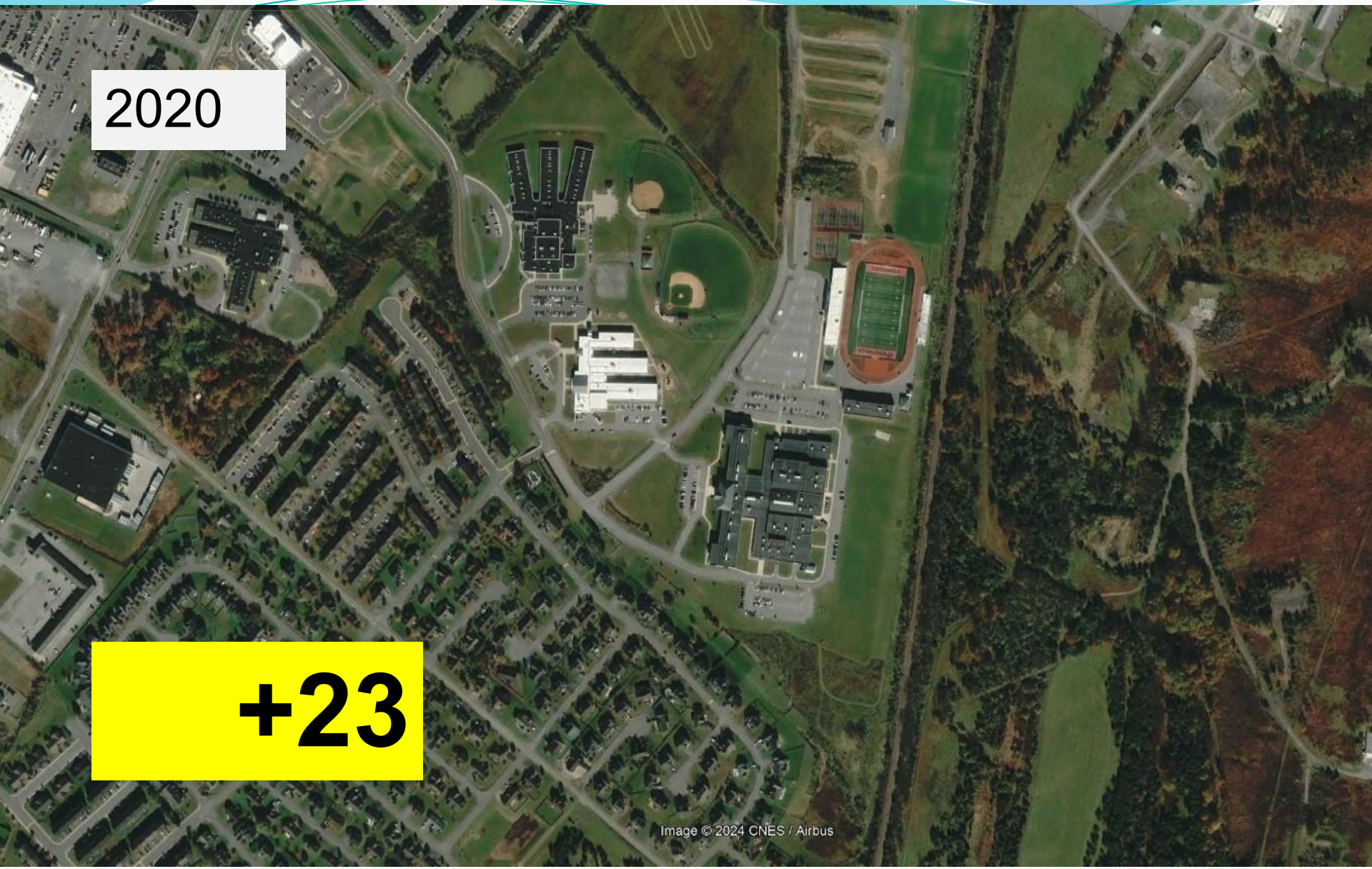
2020
Image © 2024 CNES / Airbus

1997
Again
Year 0
Image U.S. Geological Survey

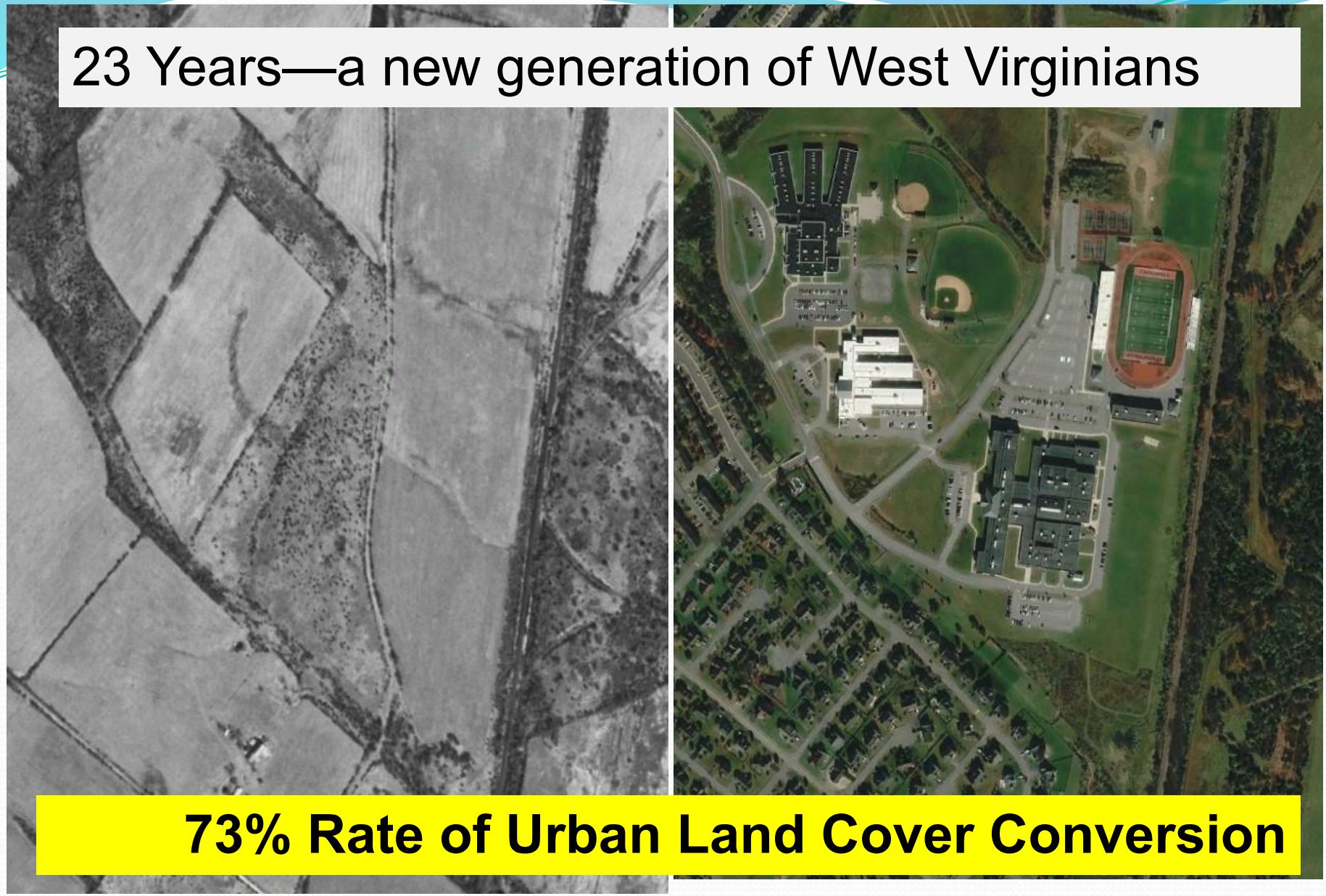

12/2003
2003
+6


2008
+9
Image U.S. Geological Survey


2013
+16


2020
+23
Image © 2024 CNES / Airbus

23 Years—a new generation of West Virginians



73% Rate of Urban Land Cover Conversion

Make it a MWEE!

CacaponInstitute.org

MWEE—Meaningful Watershed Educational Experiences

Chesapeake Bay Program
Science. Restoration. Partnership.

NOAA CHESAPEAKE BAY

FOREST SERVICE U.S. DEPARTMENT AGRICULTURE

dep

WEST VIRGINIA DIVISION OF FORESTRY

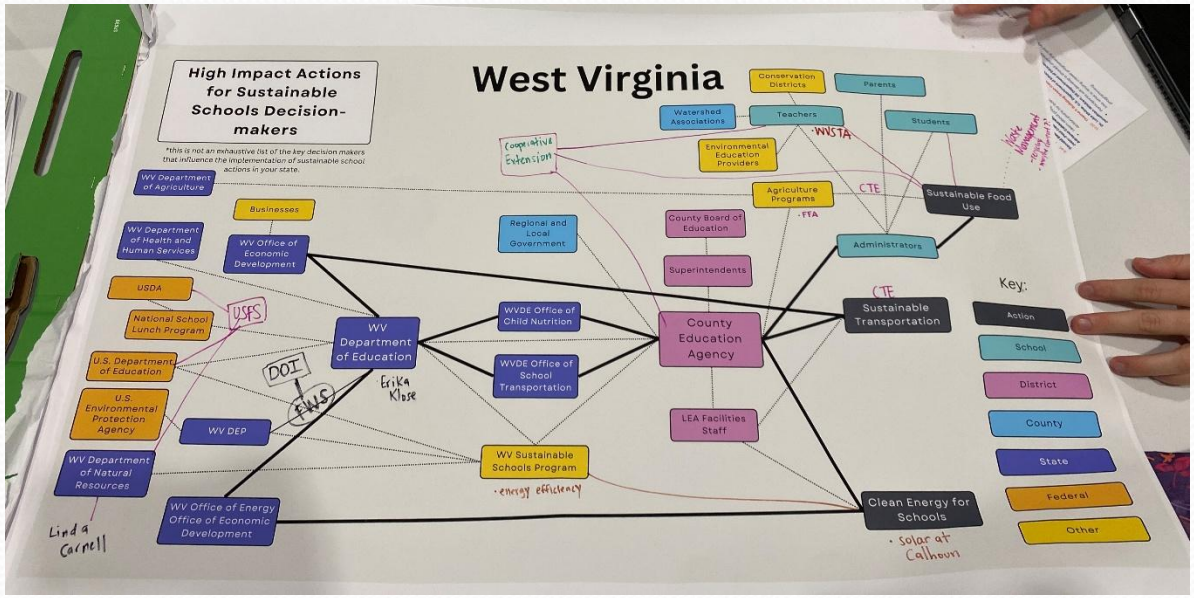
WV OLNI- Outdoor Learning Network Initiative

Cacapon Institute

Protecting Rivers and Watersheds Since 1985

50 YEARS experience LEARNING

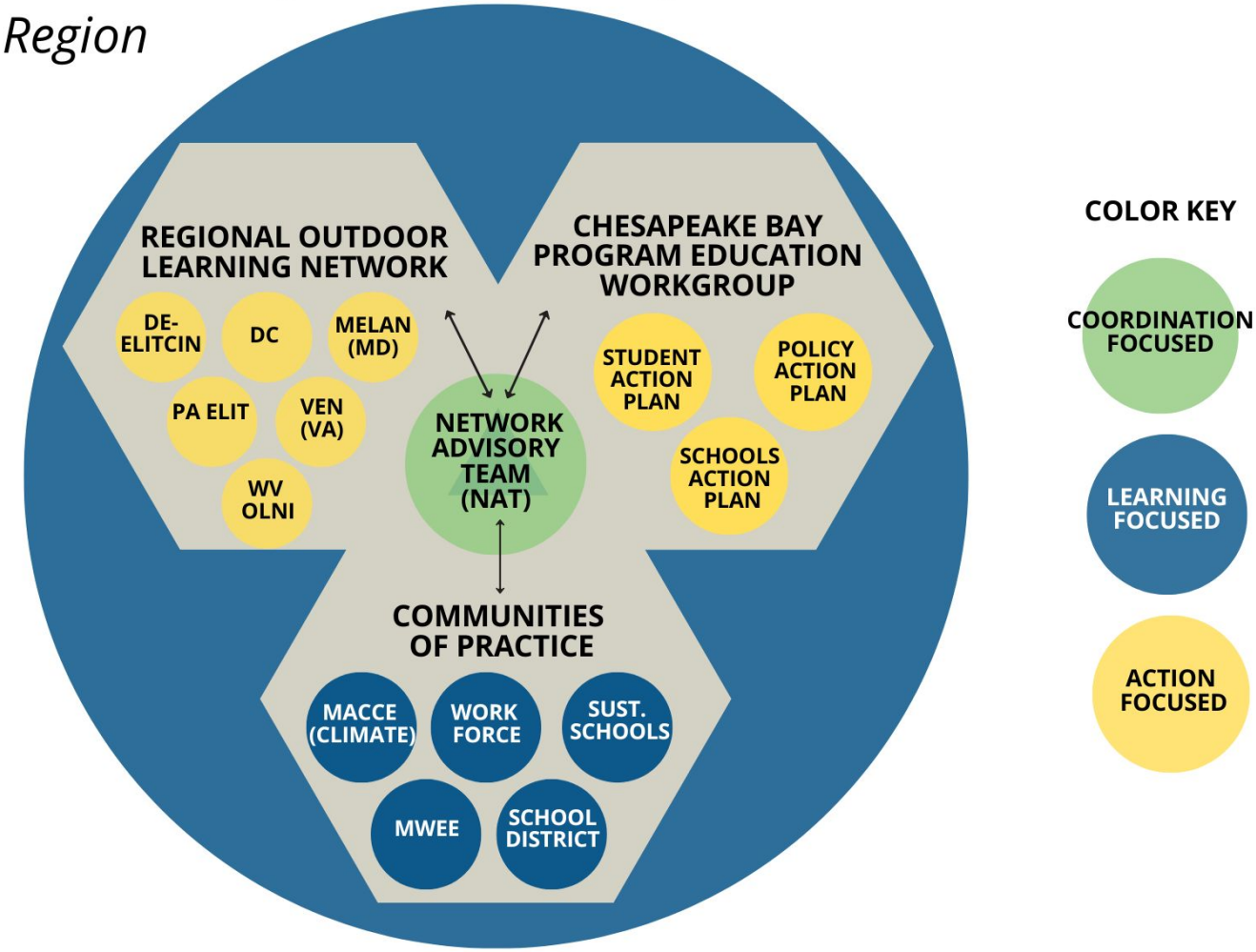
POTOMAC VALLEY AUDUBON SOCIETY



Environmental Literacy Network Ecosystem

Mid-Atlantic Region

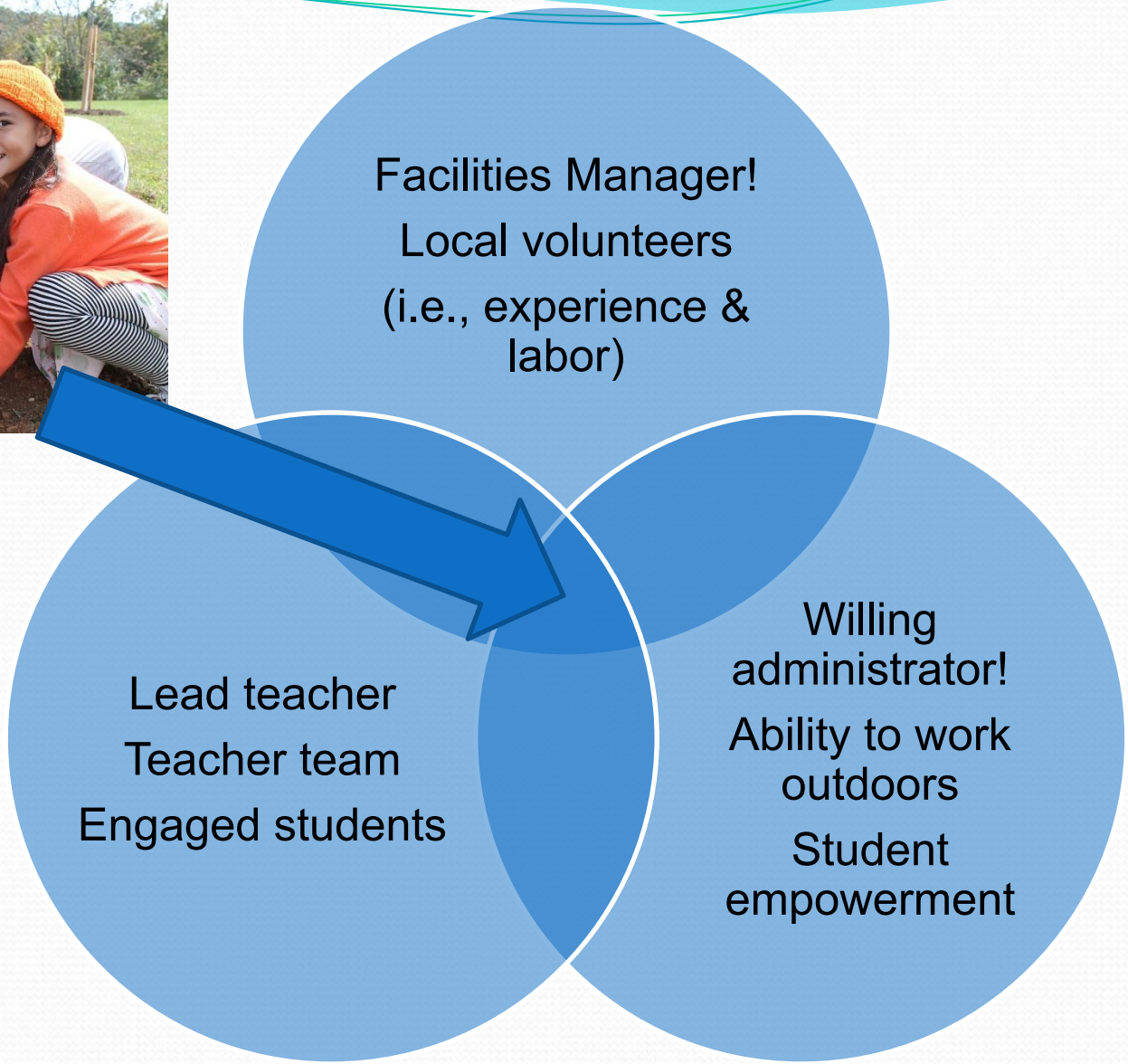
DRAFT
June 2025



This diagram represents a simplified, high-level system map of overlapping environmental literacy networks operating across the region. The Environmental Literacy Network Advisory Team (NAT) convenes quarterly to share, learn from each other, think strategically, and plan regional convenings. The colors represent the primary function of each element (as represented by the Color Key), realizing that in network life there is always a possibility for action to emerge when people come together from across sectors to share and learn together. The ROLN state networks support coordination, learning and action at the state level.

Schoolyard Tree Planting

Bring an *opportunity*—n ot a workload!



Growing Native-

Students growing trees to distribute into their communities.

Growing Native School

Hagerstown

South Mountain State Park

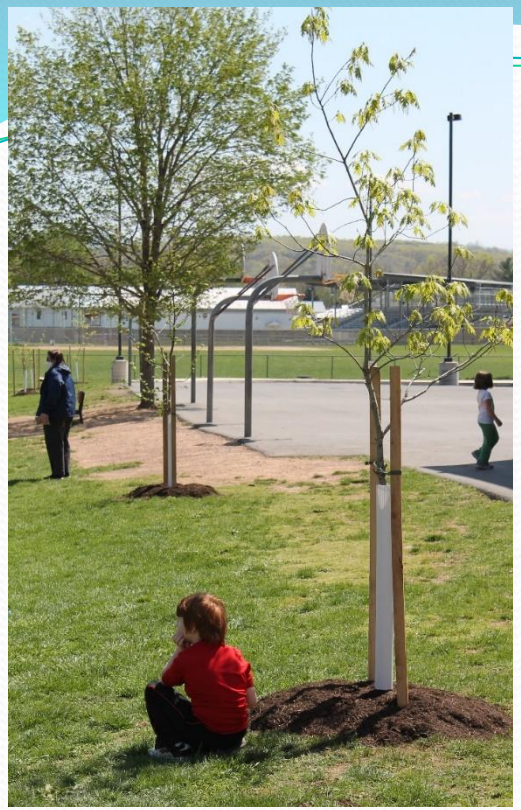
Shenandoah National Park

Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

Growing Native

Students have an opportunity for community service.

Benefits of Trees



T. Temperature

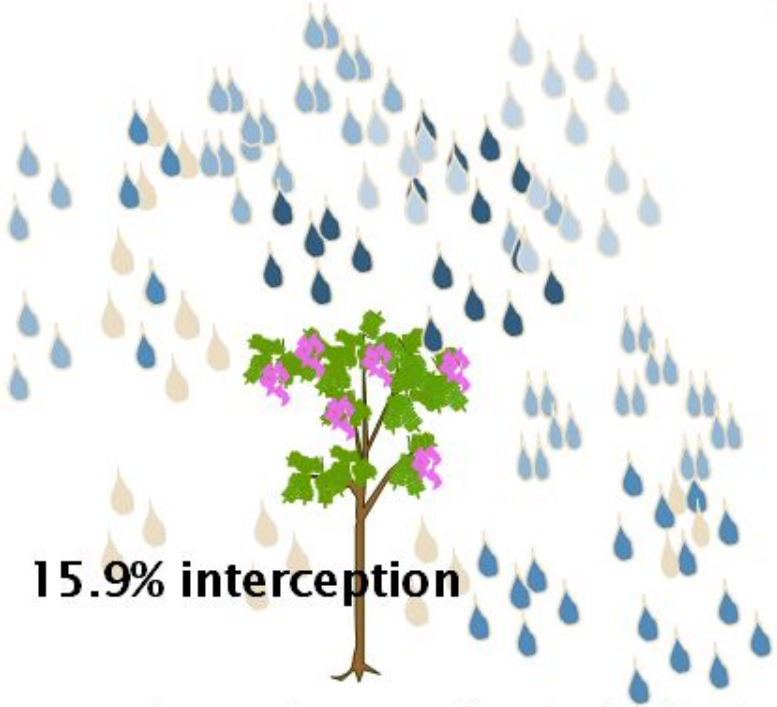
R. Runoff

E. Energy

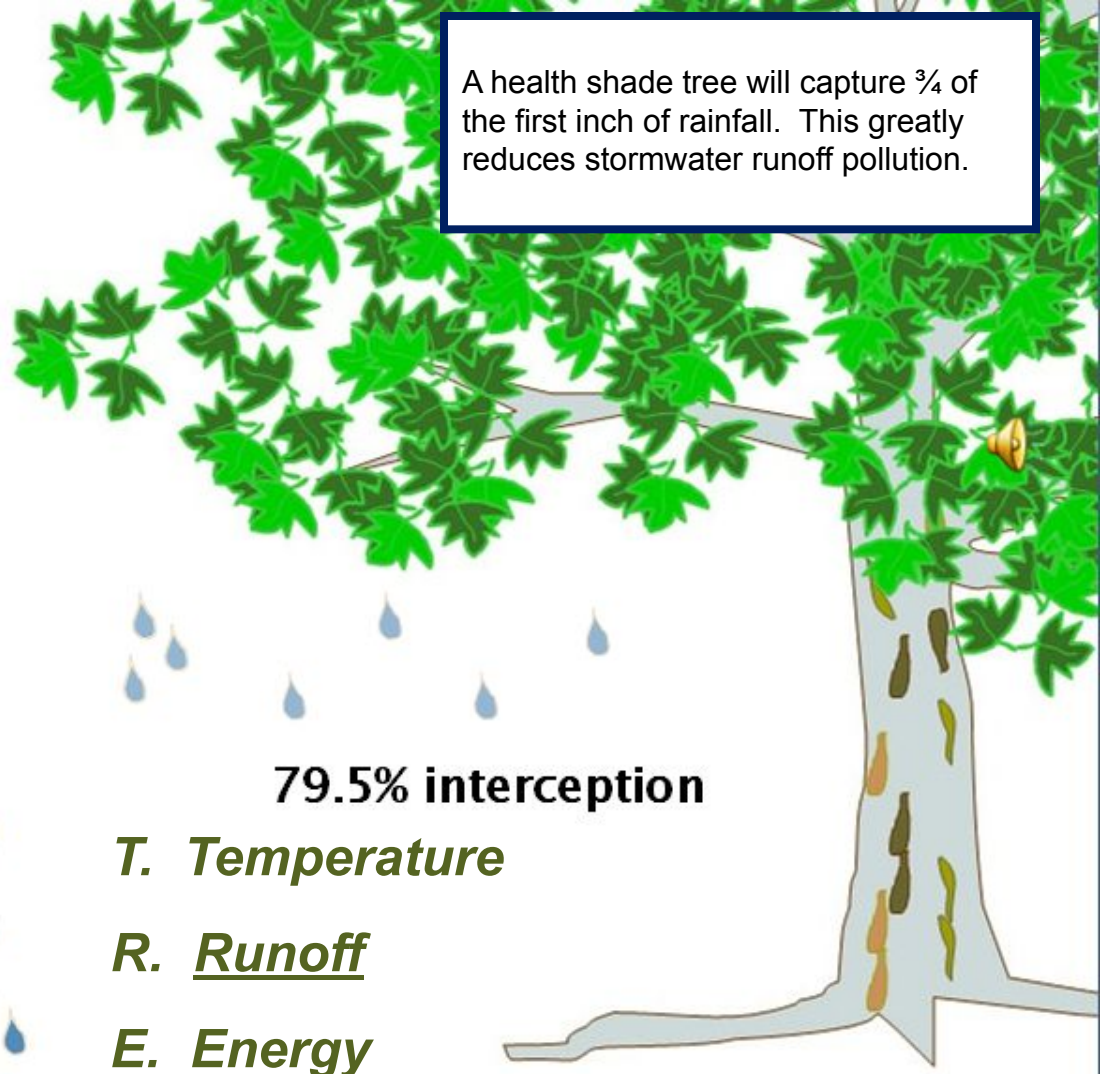
E. Environment

A health shade tree will capture ¾ of the first inch of rainfall. This greatly reduces stormwater runoff pollution.

~1 inch rainfall event (24 h)



Jacaranda mimosifolia (~2" caliper)



Platanus xacerifolia

T. Temperature

R. Runoff

E. Energy

E. Environment

Xiao Q., and E.G. McPherson. 2003. Rainfall interception by Santa Monica's municipal urban forest. Urban Ecosystems

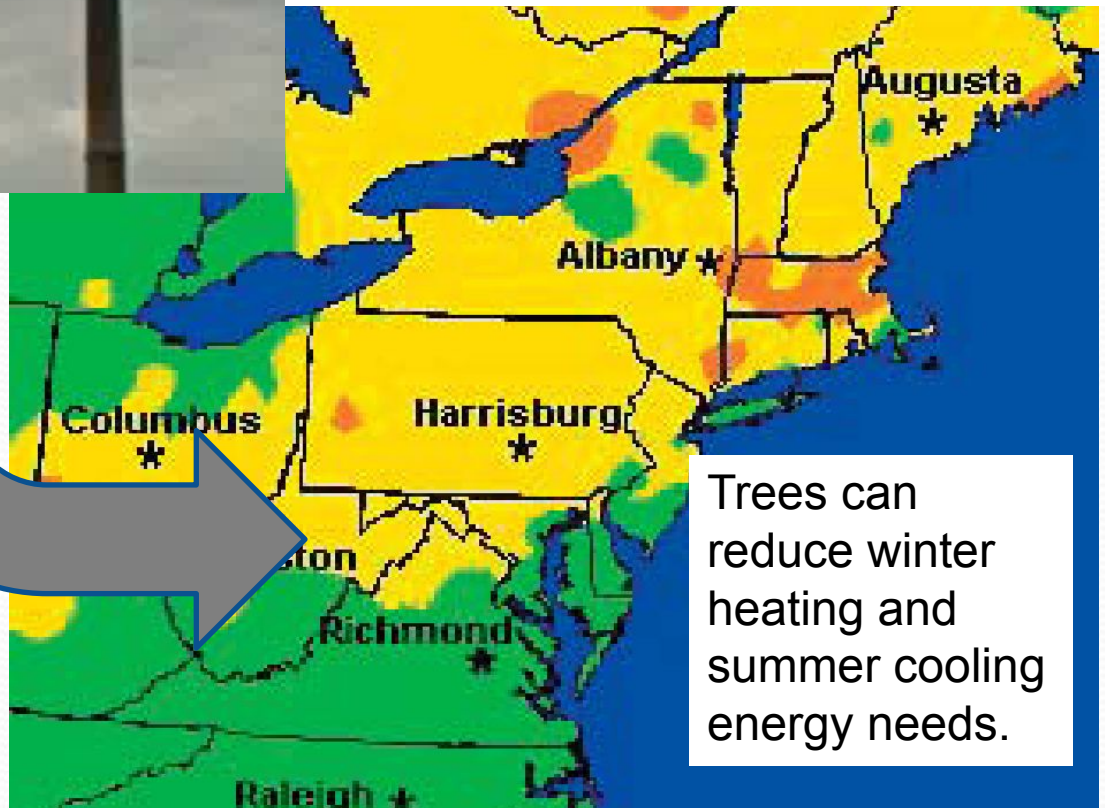
30% of the nitrogen pollution in the Chesapeake Bay is from atmospheric deposition.

T. Temperature

R. Runoff

E. Energy

E. Environment



Trees can reduce winter heating and summer cooling energy needs.

Interactive Map of Air Quality

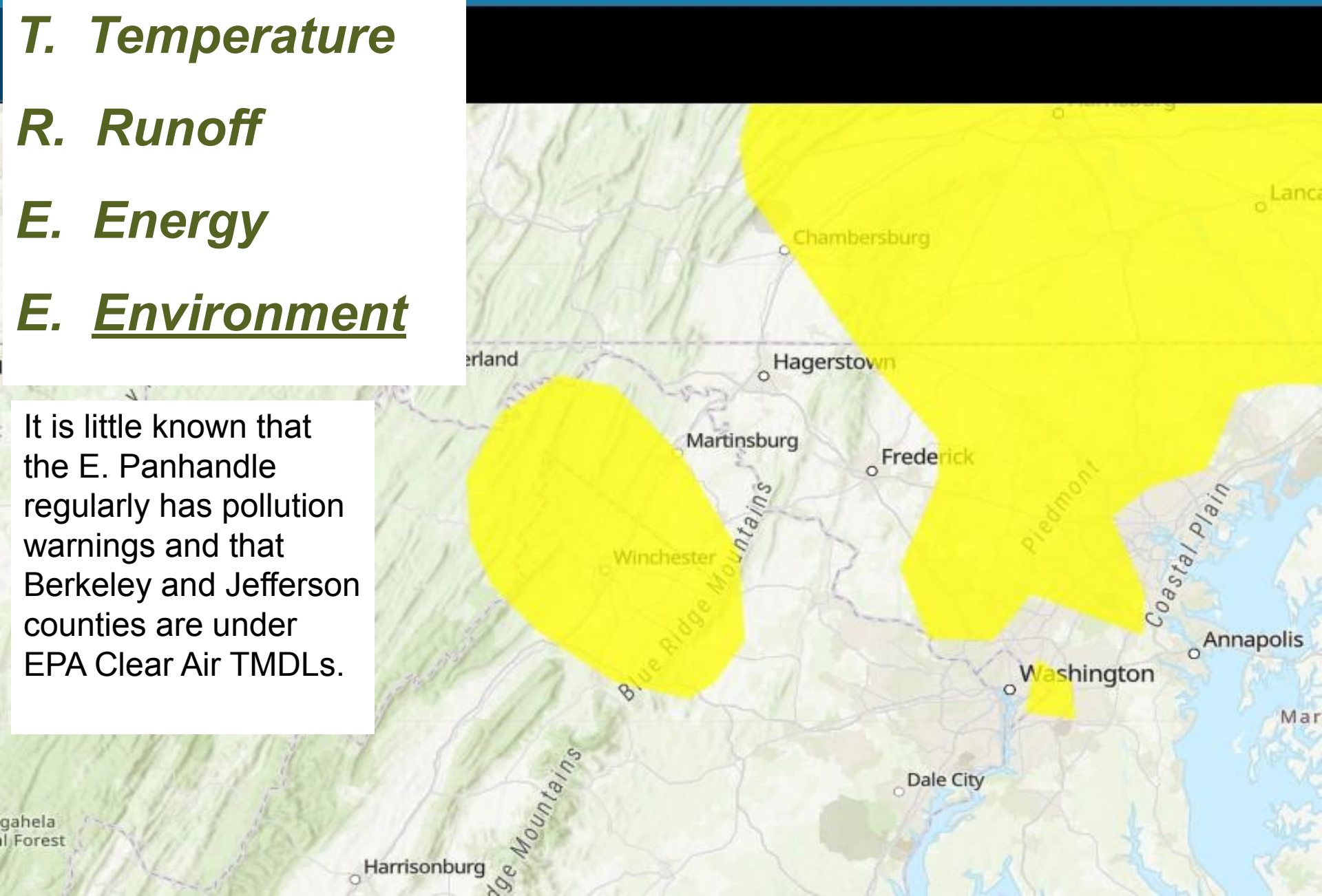
T. Temperature

R. Runoff

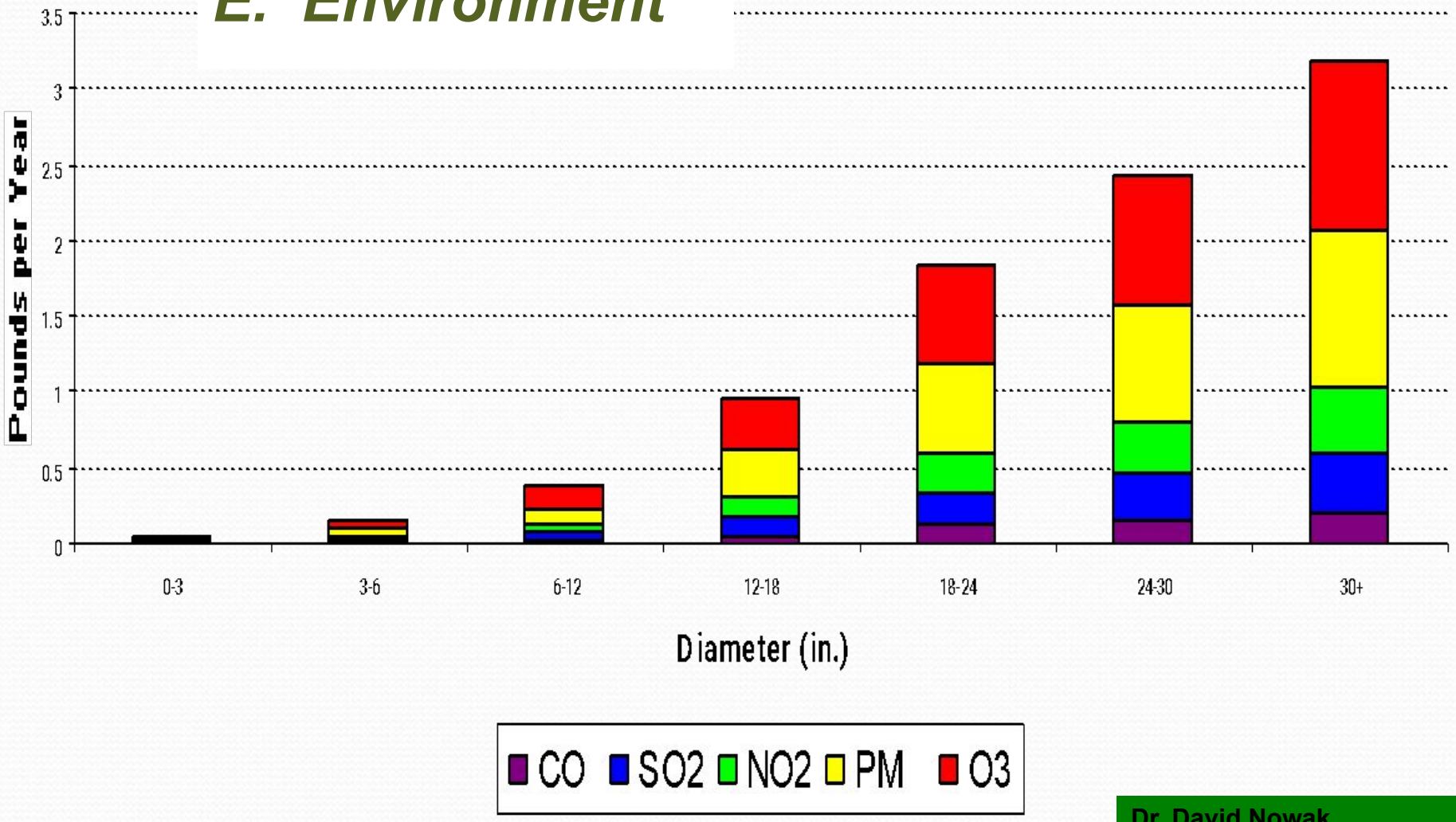
E. Energy

E. <u>Environment</u>

It is little known that the E. Panhandle regularly has pollution warnings and that Berkeley and Jefferson counties are under EPA Clear Air TMDLs.



E. Environment



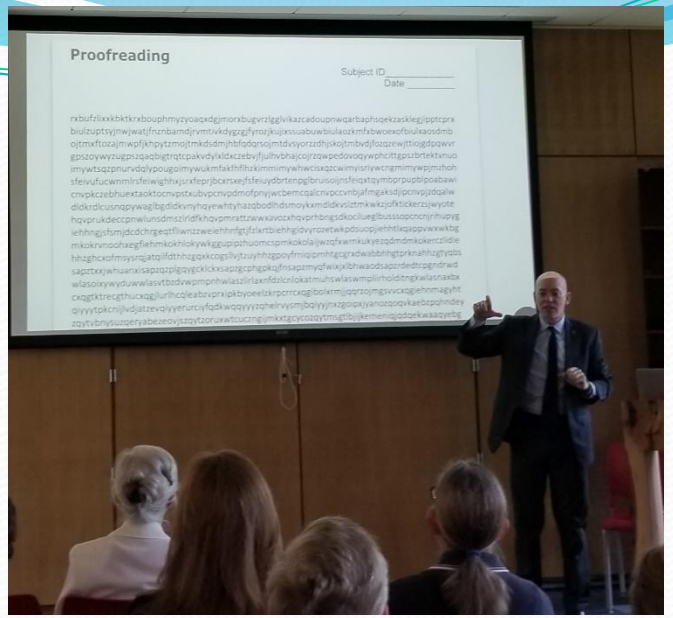
Dr. David Nowak

USDA Forest Service, NRS

Trees improve physical and mental health including improving student attention and faster recovery from stress.

Causal or coincidental?

In 2016 Dr. Sullivan's team performed the first experiment showing a causal relationship. They measured relaxation and mental attention before and after a stress test where high school students were given a break in a windowless room, a room with a built view, and a room with a view of a green environment.



Dr. Sullivan, Pittsburg, May 2018

During the experiment, sensors took physiological measures of stress measuring heart rate, skin temperature and skin moisture. The students were also asked to rate their mental fatigue and stress by filling out a questionnaire at different points during the experiment.

Students did better on the attention tests given after the break if they were in a classroom with a green view. Students showed a **13% increase in performance**. There was no statistical difference in performance for the students in the windowless room or the room with a view onto a built space.

Students in the green room **also showed a greater physiological recovery from stress** after the break than the other students.

Pre and Post Mental Tests

Color Stroop Test

Green Blue Yellow

Yellow Red Blue

Digit Forward/Backward Test. Fast as you can:

1,935 plus 13, repeat, repeat, repeat……..

1,935 minus 13, repeat, etc.

Students were assigned stressful tests and challenges.

Proofreading

Subject ID_____
Date _____

rxbufzlixxkbktkrxbouphmyzyoaqxdgjmorxbugvrzlgglvikazcadoupnwqarbaphsqekzasklegjipptcprx
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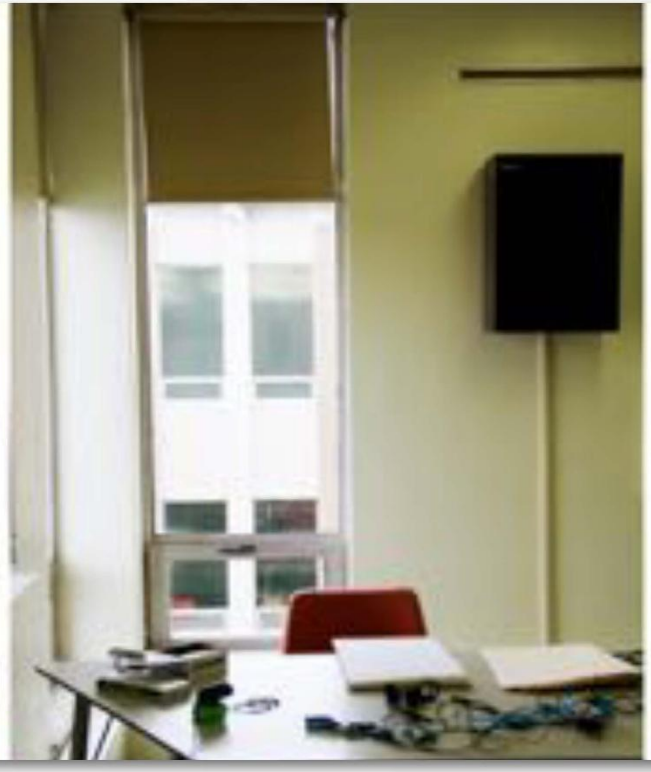
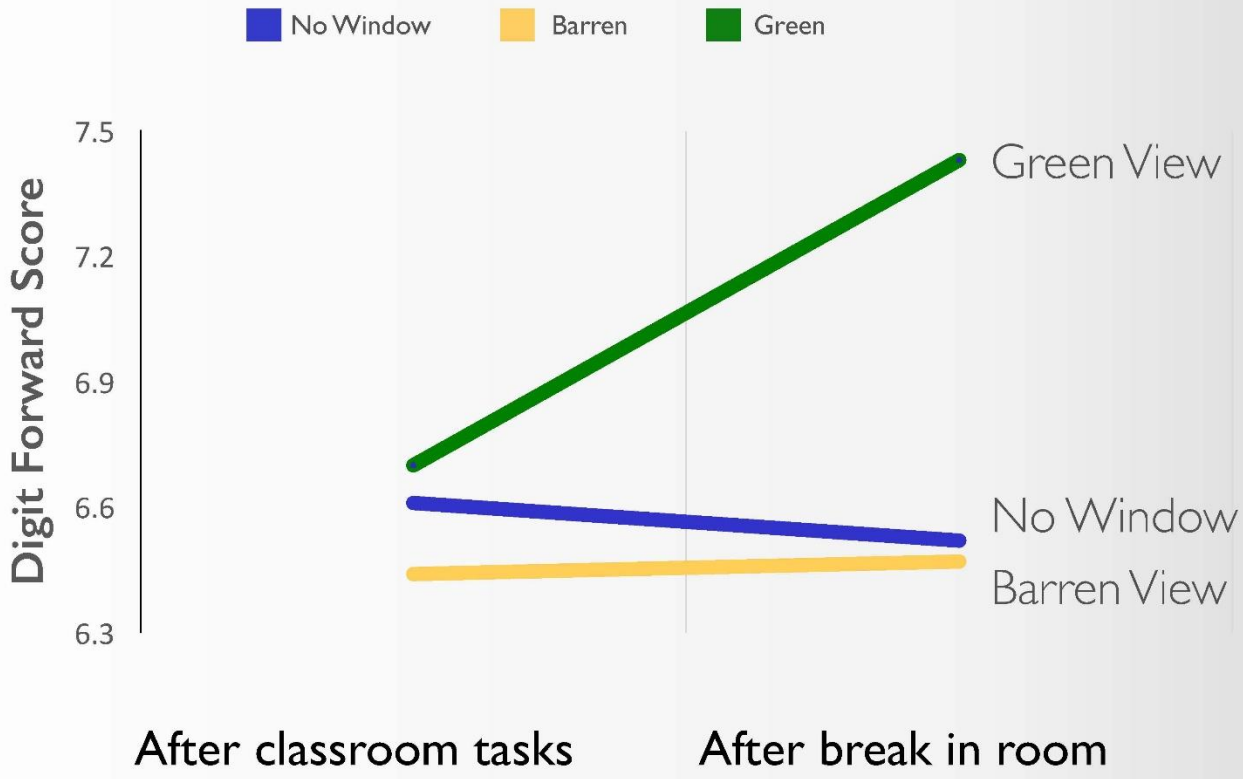
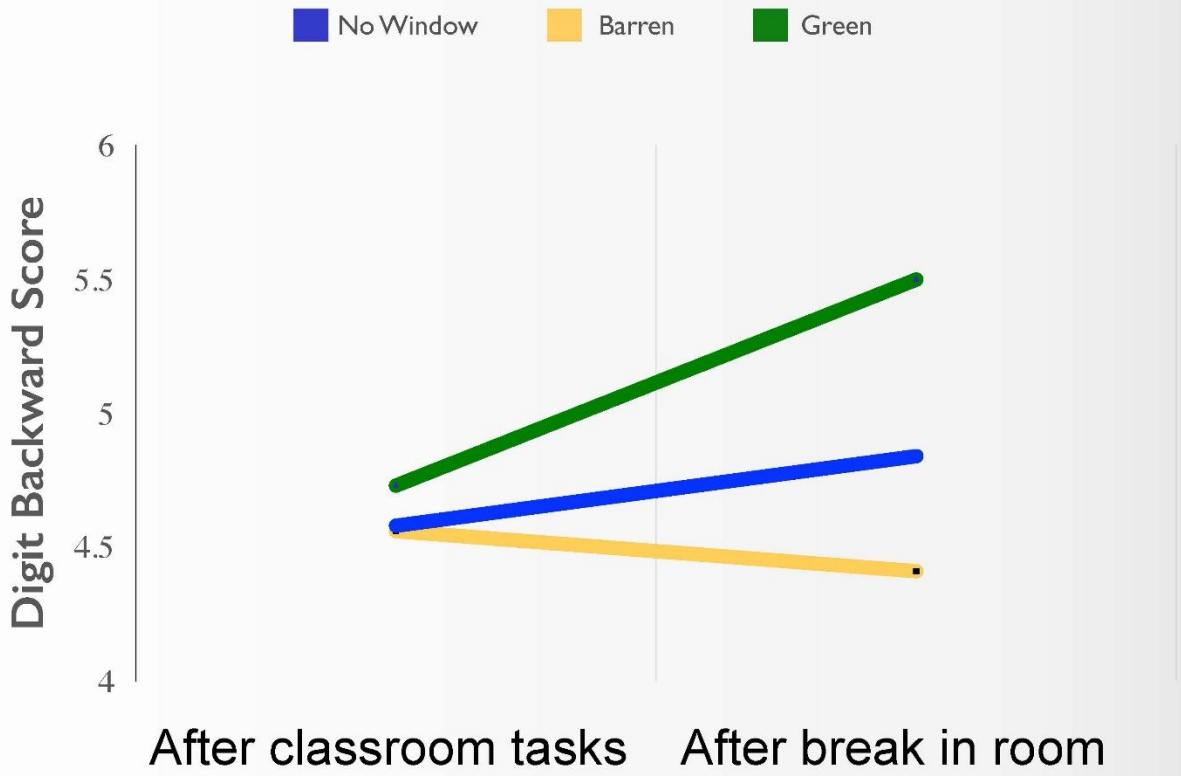
DO VIEWS TO GREEN IMPROVE ATTENTION?



EFFECT OF WINDOW VIEW ON ATTENTION



EFFECT OF WINDOW VIEW ON ATTENTION

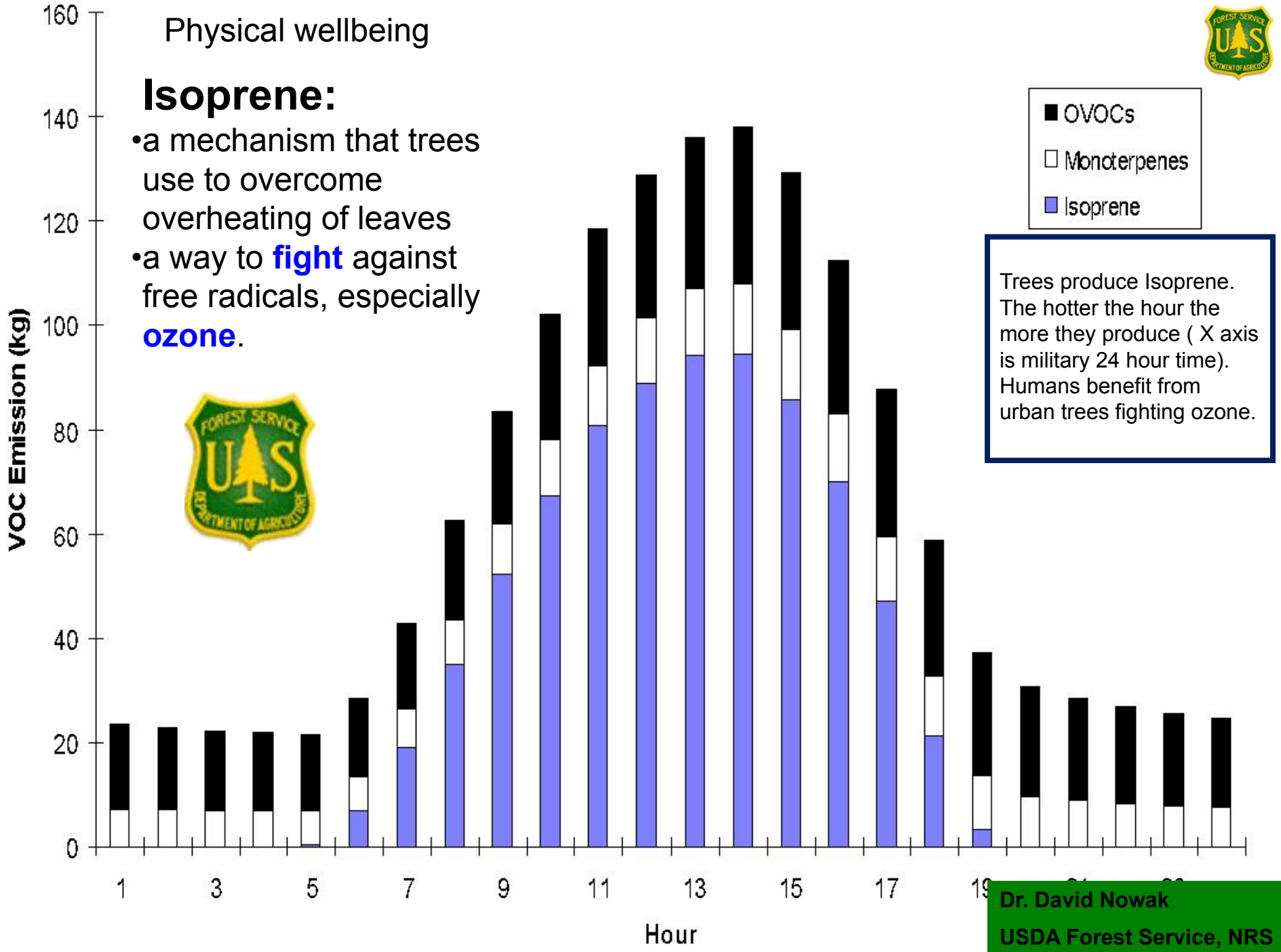


CLASSROOM WINDOW & ATTENTION

Physical wellbeing

Isoprene:

- a mechanism that trees use to overcome overheating of leaves
- a way to **fight** against free radicals, especially **ozone**.



Trees produce Isoprene. The hotter the hour the more they produce (X axis is military 24 hour time). Humans benefit from urban trees fighting ozone.

Dr. David Nowak

USDA Forest Service, NRS

Trees and Schools: Growing the Connection

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