



Benefits of Urban Trees in West Virginia

Summary of research conducted by West Virginia University



Dr. Gregory Dahle, Associate Professor of Arboriculture and Urban Forestry, WVU Davis College of Agriculture, Natural Resources and Design, conducted a study funded by a grant provided by the West Virginia Division of Forestry. The goal was to quantify ecosystem services provided by urban trees within Tree City U.S.A (TCUSA) communities throughout West Virginia.

Dr. Dahle, undergraduate student Angela Sakazaki, and graduate students Matthew Walker and Robert Eckenrode, utilized USDA Forest Service software, i-Tree Canopy, to estimate canopy cover and calculate the ecosystem services provided by urban forests within TCUSA communities. Results document that West Virginia’s urban forests make significant contributions to communities including sequestering 2,847,190 tons of carbon providing a total benefit of \$53,308,328 in stored carbon. Additional ecosystem services involve the annual capture of 4,348,592 pounds of pollutants with an estimated value of \$6,441,179 across TCUSA communities.

| Pollution Removal | |
|-------------------|--------------------|
| City | Benefit (\$) |
| Bath | 5,301 |
| Bluefield | 1,057,616 |
| Elkins | 187,526 |
| Follansbee | 137,671 |
| Harpers Ferry | 44,457 |
| Hinton | 435,164 |
| Huntington | 1,472,972 |
| Lewisburg | 116,606 |
| Morgantown | 453,356 |
| Parkersburg | 373,394 |
| Romney | 73,131 |
| Ronceverte | 72,579 |
| Shepherdstown | 18,689 |
| Summersville | 279,607 |
| Vienna | 161,498 |
| Wheeling | 1,498,111 |
| Williamstown | 48,457 |
| WVSU Campus | 5,041 |
| TOTAL: | \$6,441,179 |

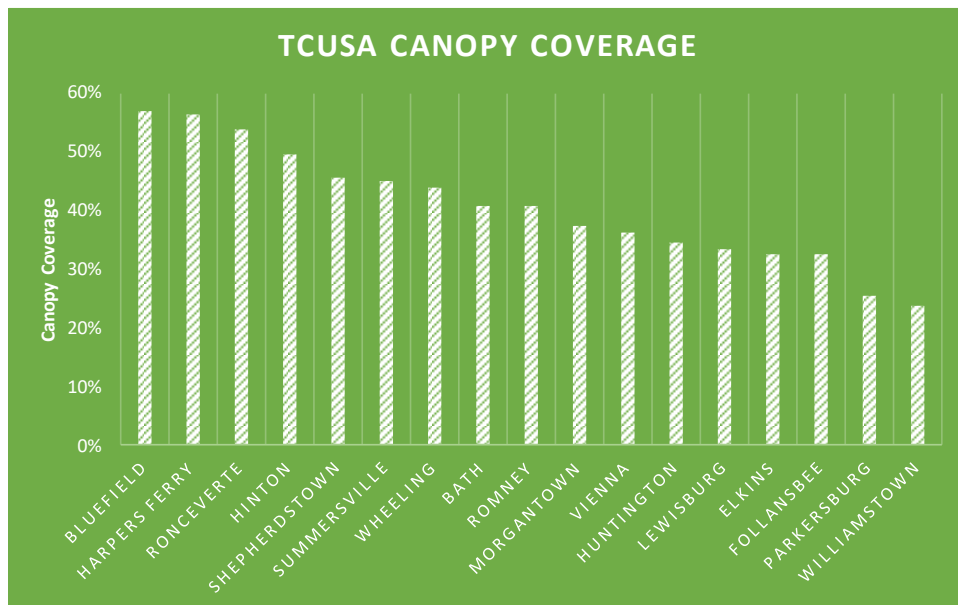
Estimated annual pollution removal benefits. The values were obtained by summing the annual benefits (CO, NO², O³, PM_{2.5}, PM₁₀, CO²_{seq}) calculated by i-Tree Canopy.

| Carbon Captured | | |
|-----------------|------------------|---------------------|
| City | Amount (tons) | Value (\$) |
| Bath | 7,936 | 153,673 |
| Bluefield | 402,638 | 7,796,418 |
| Elkins | 82,105 | 1,589,817 |
| Follansbee | 54,660 | 1,058,399 |
| Harpers Ferry | 27,964 | 541,474 |
| Hinton | 121,685 | 1,178 |
| Huntington | 508,010 | 9,836,776 |
| Lewisburg | 102,235 | 1,979,603 |
| Morgantown | 317,303 | 6,144,052 |
| Parkersburg | 257,358 | 4,983,309 |
| Romney | 29,600 | 1,071,116 |
| Ronceverte | 63,634 | 1,232,158 |
| Shepherdstown | 11,756 | 227,627 |
| Summersville | 154,128 | 2,984,428 |
| Vienna | 111,311 | 2,155,357 |
| Wheeling | 559,428 | 10,832,400 |
| Williamstown | 33,399 | 646,710 |
| WVSU Campus | 2,040 | 73,833 |
| TOTAL: | 2,847,190 | \$53,308,328 |

Estimated total carbon stored in trees, amounts derived from iTree Canopy.

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The study categorized each of WV's TCUSA communities and Wheeling into one of three groups: cities with greater than 40% canopy coverage, cities between 30-40% canopy coverage, and cities with less than 30% canopy coverage. These categories help communities set management objectives, prioritize budgets, and increase canopy coverage.



According to the study, optimal canopy coverage for an urban area is 40% or greater. The study provides management suggestions based on overall urban forest canopy coverage. See below for suggestions on how to manage your urban forest.

| TCUSA Urban Canopy Management Suggestions | | |
|---|-----------------|---|
| TCUSA Cities | Canopy Coverage | Management Suggestions |
| Bluefield | 40% and above | Budget Primarily for maintenance, maximization of ecosystem services; with planting new trees as a secondary role. Managing for species diversity, removal of invasive species, staggered age distribution, equal access to urban forest resources across demographics, increasing canopy coverage to 51% in riparian areas to increase storm water mitigation. |
| Harpers Ferry | | |
| Ronceverte | | |
| Hinton | | |
| Shepherdstown | | |
| Summersville | | |
| Wheeling | | |
| Bath | | |
| Romney | 30% to 40% | Managing to obtain the ultimate goal of 40% canopy coverage by budgeting for both new plantings and maintenance of existing canopy. |
| Morgantown | | |
| Vienna | | |
| Huntington | | |
| Lewisburg | | |
| Elkins | | |
| Follansbee | | |
| Parkersburg | Below 30% | Budget primarily for new plantings and increasing the urban canopy; routine and emergency maintenance should be accounted for appropriately. |
| Williamstown | | |

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Reasons to Increase Urban Canopy Cover

Urban forests. . .

- Mitigate storm water runoff by utilizing waste water that would otherwise end up in storm drain systems. Tree roots provide critical soil stabilization and reduce soil erosion.
- Conserve energy. In summer, trees providing shade which reduces cooling costs. In winter, trees act as a windbreak which reduces heating costs.
- Increase property values and increase economic stability. Studies show, people spend more time on tree lined streets, attracting tourists and business to urban forests. Real estate with healthy trees can increase property values by up to 15%.
- Create habitat for wildlife and foster plant diversity by providing food and shelter.
- Improve the health of individuals that live and work in urban areas by creating feelings of relaxation and promoting a sense of privacy.
- Reduce air pollution in urban areas. Perhaps the most relevant reason for urban forests is their ability to capture carbon and release oxygen. The urban forests of Wheeling, for example, has captured nearly 560,000 tons of carbon which is the equivalent of burning 56,000,000 gallons of gasoline.



Gray Squirrel in Ritter Park Huntington, WV. Photo provided by: www.wvgazetteemail.com



Crocheted oak tree, Morgantown WV. Photo provided by: www.wv-art.com

For more information on Urban Forestry in West Virginia contact:

WV Division of Forestry Urban and Community Forestry Staff

- ***Bob Hannah, Urban Forestry Coordinator***

Grant assistance & information, technical assistance

Farmington Office, Region 1

Robert.L.Hannah@wv.gov

(304) 825-6983 office

- ***Sam Adams, Urban Forester***

Technical assistance (grants, education, training & consulting)

Farmington Office, Region 1

Samuel.T.Adams@wv.gov

(304) 216-1254 cell

- ***Andy Sheetz, Partnership Coordinator***

Project funding assistance, Volunteer group coordination, Project Learning Tree

Charleston Office, State Headquarters

Andy.I.Sheetz@wv.gov

(304) 558-1264 office

For more information on the Tree City USA program visit:
<https://www.arborday.org/programs/treecityusa>