Appendix C: Key National Technology Transfer Products

Air Photo Interpretation Tool

http://www.fs.fed.us/ne/syracuse/Tools/downloads/Aer_phot_interp.zip

Description: A Geographic Information System (GIS) tool to speed up the photo interpretation of digital images (e.g., DOQs, scanned aerial photos). The tool creates a dialog box containing user-defined categories that moves the view from one photo interpretation point to the next. Points can be arranged randomly or on a regular grid. This tool is an extension file for ArcView 3.2.

Benefits: Ability to quickly assess urban cover characteristics over large or small areas with a statistical accuracy assessment.

Funded by: Forest Service, U.S. Department of Agriculture (USDA).
Location: Northern Research Station.

Air Pollution Removal Calculator

http://www.fs.fed.us/ne/syracuse/Tools/downloads/Air%20Pollution.zip
http://www.fs.fed.us/ne/syracuse/Tools/pollution/PollutionProgram.php

Description: This program estimates pollution removal and value for urban trees based on basic user inputs about the study area (e.g., a park). This program uses local data analyzed for various cities by the Urban Forest Effects (UFORE) model.

Benefits: Ability to quickly assess urban cover characteristics over large or small areas with a statistical accuracy assessment.

Funded by: Forest Service, Trust for Public Lands.
Location: Northern Research Station.
Partners: Forest Service, Trust for Public Lands.

Appreciation Tool Kit for Urban and Community Forestry

http://www.na.fs.fed.us/urban/inforesources/ucftoolkit/ucftoolkit.shtm

Description: The tool kit was developed to promote Urban and Community Forestry (U&CF) as a crucial component of livability in communities and targets decisionmakers as champions for message delivery. The "Bring Life to Your Community Plant Trees" logo, developed with U&CF challenge cost-share program funding recommended by the National Urban and Community Forestry Advisory Council (NUCFAC), is used throughout the kit.

Benefits: This kit makes it easy for users to educate community leaders about all the ways community trees contribute to quality of life and a city/town's social, economic and environmental well-being. These outreach materials show that trees are a critical component of urban infrastructure and that they require financial commitment for care.

Funded by: Forest Service, U&CF challenge cost-share program.
Location: Forest Service, Northeastern Area State and Private Forestry (S&PF).
Partners: Forest Service, Northeastern Area State and Private Forestry, District of Columbia Urban Forestry Administration, Delaware Department of Agriculture, New Jersey Forest Service, Maryland Department of Natural Resources Forest Service, West Virginia Division of Forestry, Pennsylvania Department of Conservation and Natural Resources, and Ohio Department of Natural Resources.

Biogenic VOC Emission Estimated Rates for Common U.S. Tree and Shrub Genera

http://www.fs.fed.us/ne/syracuse/vocrates.pdf

Description: Volatile Organic Compound (VOCs) emissions contribute to ozone and carbon monoxide formation. Tree species differ in the amount of VOCs emitted per gram of leaf mass. This document lists the estimated amount of isoprene and monoterpene emission (the two dominant VOC chemicals emitted by trees) for numerous genera. Emission rates are in micrograms of C/g of leaf dry weight/hr (standardized to 1,000 $\mu mol\ m^{-2}\ s^{-1}$ of photosynthetically active radiation and 30 ^{o}C). Some emission rates on list were not measured; rather they are median values of botanical relatives.

Benefits: Understanding the differences in VOC emission rates among species to aid in proper species selection to improve air quality.

Funded by: Forest Service.
Location: Northern Research Station.

CanVis: Image Editing for Resource Planning

http://www.unl.edu/nac/simulation/products.htm#canvis

Description: The CanVis image editing software is an entry-level program that enables resource professionals to create photorealistic simulations that can demonstrate to decision-makers what a potential project will look like. It runs on a Windows-based computer and requires a Pentium 166 MHz or faster processor with 32 MB of RAM or higher.

Benefits: Photorealistic simulations provide a powerful planning tool to communicate ideas visually, leading to better decision-making. Simulations can improve adoption and support for natural resource management. Although image-editing software has been available for some time, the CanVis software, Visual Simulation Guide, and Self-pace Tutorials fill an important niche.

Funded by: U.S. Environmental Protection Agency (EPA), Mid-America Regional Council, Forest Service Research and Development (R&D)/S&PF, USDA Natural Resources Conservation Service (NRCS).
Location: USDA National Agroforestry Center, Lincoln, NE.
Partners: Mid-America Regional Council, USDA NRCS.

Cooperating Across Boundaries: Partnerships To Conserve Open Space in Rural America

http://www.fs.fed.us/projects/four-threats/documents/cooperatingacrossboundaries.pdf

Description: S&PF and R&D have released this new publication, which highlights the importance of open space, explores how growth trends in rural America are changing the Nation's forests, and offers practical ideas for balancing growth and conservation.

Benefits: Developed as part of the Forest Service's emphasis on the "Four Threats," the publication focuses on the benefits of partnerships and working across jurisdictional boundaries to conserve open space in rural America. It also kicks off the development of a national strategy and implementation plan to identify ways for the Forest Service to help conserve open spaces.

Funded by: S&PF and R&D, Forest Service.
Location: Washington Office, Washington, DC.
Partners: Numerous public and private organizations.

Effect of Urban Trees on Air Quality

http://www.fs.fed.us/ne/syracuse/TREE%20Air%20Qual.pdf

Description: A short document summarizing the research on the effects of urban trees on air quality.

Benefit: A relatively simple summary of an important and complicated subject.

Funded by: Forest Service.
Location: Northern Research Station.

Electronic Mailing Lists (LISTSERV)

ufresearch@list.treelink.org
LISTSERV@unri.org.
http://www.interfacesouth.org/swuinet/listserve.html

Description: An electronic mailing list, a type of Internet forum, is a special usage of e-mail that allows for widespread distribution of knowledge to many Internet users. One type of electronic mailing list is an announcement list, which is used primarily as a one-way conduit of information and can be "posted to" only by selected people. A more common type of electronic mailing list is a discussion list, in which any subscriber may post.

Benefit: On either type of list, announcement or discussion, the subscriber receives a lot of information at no cost. The added benefit of the discussion list is that the subscriber can use the mailing list to send messages/questions to all the other subscribers, who may answer in similar fashion. Thus, actual discussion and information exchanges can happen. Mailing lists of this type are usually topic oriented.

Funded by: Forest Service.
Location: TreeLink.
Partners: Forest Service, TreeLink.

Other active LISTSERVs:

- Alliance for Community Trees: act@list.treelink.org.
- California Department of Forestry and Fire Protection: urbanforest@yahoogroups.com.
- International Society of Arboriculture (ISA): isa@isa-arbor.com.
- Trees: trees@list.treelink.org.
- Society of Municipal Arborists: sma@urban-forestry.com.
- National Association of State Foresters: nasf@stateforesters.org.

Flammability Key

http://www.interfacesouth.org/products/flammability_key.html

Description: This flammability key can be used to determine whether a species is appropriate for a firewise plant list.

Benefits: The preparation of outreach materials on firewise plants may present a challenge to natural resource professionals because information is not widely available, particularly for local circumstances. This step-by-step method assists natural resource professionals, such as extension agents, urban foresters, landscape architects, nursery personnel, and others, with the development of local firewise plant lists that can assist local homeowners with firewise landscaping.

Funded by: National Fire Plan and Southern Research Station.
Location: InterfaceSouth Web site, Fact sheet.
Partners: University of Florida, Southern Group of State Foresters.

Additional resource: http://www.interfacesouth.org/products/fact_sheets/Preparing_Firewise_Plant_List.pdf

Green Infrastructure Resources Web Site

http://www.greeninfrastructure.net/

Description: This Web site is a collection of the latest knowledge on Green Infrastructure. It provides solutions to users to ensure environmental protection and a higher quality of life for communities as well as regulatory predictability for landowners and investors.

Benefits: Just as all forms of built infrastructure are promoted for the wide range of public and private benefits they provide, this Web site promotes Green Infrastructure systems for the wide range of essential ecological and social functions, values, and benefits that accrue to people and nature.

Funded by: Forest Service.
Location: The Conservation Fund, Arlington, VA.
Partners: Forest Service, The Conservation Fund.

Guideline Specifications for Nursery Tree Quality

http://www.urbantree.org/specs.asp

Description: A committee composed of municipal arborists, urban foresters, nurserymen, U.C. Cooperative Extension horticultural advisors, landscape architects, nonprofit tree groups, horticultural consultants, etc., developed the specifications to ensure high-quality landscape trees. After more than a year of work, they succeeded in drafting a document entitled Specification Guidelines for Container-grown Trees for California.

Benefits: The intent of the Guidelines is to help landscape professionals develop their own comprehensive and detailed specifications to ensure that they obtain high-quality container-grown nursery trees. The document is also intended to help nursery professionals in their efforts to improve the quality of trees grown in California. These specifications can be modified for specific simulations.

Funded by: California Department of Forestry and Fire Protection, Forest Service, SafeTree.
Location: Urban Tree Foundation, Visalia, CA.
Partners: Urban Tree Foundation, California Department of Forestry and Fire Protection, California ReLeaf, Western Chapter ISA.

Guidelines for Developing and Evaluating Tree Ordinances

http://phytosphere.com/treeord/index.htm

Description: This Web site provides a variety of tools and resources for citizens and local governments interested in developing, revising, or evaluating local tree ordinances.

Benefits: Rather than using a "model ordinance" approach, the site describes how tree ordinance development can be integrated with an overall community tree management program. The site includes annotated examples of effective tree ordinance provisions used throughout the country. It also provides detailed descriptions of practical methods used to monitor community tree resources, tree management activities, and community attitudes.

Funded by: Forest Service, ISA, and ESRI, Inc.
Location: Phytosphere, Vacaville, CA.
Partners: Forest Service, ISA, and ESRI, Inc., Phytosphere Research, American Forests, Society of Municipal Arborists, International City Management Association, National Association of State Foresters, Alliance for Community Trees, California ReLeaf, American Planning Association.

Individual Tree Carbon Calculator

http://www.fs.fed.us/ne/syracuse/Tools/downloads/Individual%20Tree%20Carbon%20Estimator.xls

Description: Spreadsheet programs to estimate the carbon storage and sequestration rates for a sugar maple and a white pine. These EXCEL spreadsheets provide a rough approximation of tree carbon storage and sequestration rates based on user inputs of tree growth rates. Urban tree diameter growth rates are typically between 0.1 and 0.4 inches per year.

Benefits: These programs are designed to provide quick and easy estimates of individual tree carbon.

Funded by: Forest Service.
Location: Northern Research Station.

i-Tree

http://www.itreetools.org/

Description: i-Tree is a state-of-the-art, peer-reviewed software suite, developed by Forest Service researchers and partners, that provides U&CF analysis and benefits assessment tools. In addition to the Street Tree Resource management and Analysis Tool for Urban forest Managers (STRATUM) and Urban Forest Effects model (UFORE) applications, i-Tree brings together other complimentary urban forestry utilities: Tree Inventory PDA—Personal Digital Assistants Utility, Sample Inventory Generator, MCTI—Mobile Community Tree Inventory, and Storm Damage Assessment Protocol. Some of these tools were designed to facilitate and support inventory data collection and management needed for UFORE and STRATUM projects. Other utilities provide analyses that go beyond the reporting features of STRATUM and UFORE.

Benefits: The current release of the i-Tree suite has been in development for more than 10 years as individual components. For the first time, complete support of the software is available to the user through Davey Tree Expert Company staff—Web site, e-mail, regular mail, or phone.

Funded by: Forest Service, The Davey Tree Expert Company.
Location: The Davey Tree Expert Company, Stow, OH.
Partners: Forest Service, The Davey Tree Expert Company, National Arbor Day Foundation, and Society of Municipal Arborists.

Lessons Learned in the Inner City

http://www.na.fs.fed.us/urban/hottopics/05_UF_Inner_City_Forum_Aug5.pdf

Description: This publication shares the voices, experience, and expertise of individuals striving to engage community residents, catalyze a stewardship ethic, and build local capacity in some of the most challenging urban environments in America.

Benefits: Readers will use this knowledge to spark ideas, replicate success, avoid failure, and speed their own efforts in improving environmental equity, public health, economic development, and quality of life in distressed communities nationwide.

Funded by: Forest Service.
Location: Forest Service Northern Area.
Partners: Forest Service and numerous nonprofit tree organizations.

Natural Inquirer: Urban Forest Edition (vol. 6, no. 1)

http://www.urbanforestrysouth.org/Resources/Collections/Collection.2005-04-22.3503/view

Description: The Natural Inquirer is a journal of scientific research written for middle school teachers and students. This volume highlights Forest Service research related to urban forestry.

Benefits: This urban forest edition includes research related to ultraviolet radiation, street trees, parking lot shade, residential property value, stormwater runoff, and park visitation. Children (elementary through high school) will obtain a better understanding of the role trees play in their lives.

Funded by: Washington Office R&D and S&PF U&CF.
Location: Washington Office.
Partners: Washington Office Research, Forest Service Researchers, and Research Stations.

OASIS NYC

http://oasisnyc.gc.cuny.edu

Description: The New York City Open Accessible Space Information System Cooperative (OASIS) is a one-stop, interactive mapping and data analysis application that is available via the Internet to enhance the stewardship of open space for the benefit of New York City residents.

Benefits: OASIS enables New York City community residents to: create maps of open space by ZIP code, borough, tax block and lot, and/or neighborhood; identify key open space resources within or near a user-defined area; locate these resources by name, type, and other attributes in addition to geographic-based searches; identify other natural resources and landmarks near or adjacent to open spaces in the city; calculate statistics based on open space patterns by ZIP code, borough, tax block and lot, and/or neighborhood; undertake "what if" scenarios, such as, what would my neighborhood look like if these vacant lots remained community gardens, or how would new bike lanes or bus routes improve my access to a park in the Bronx; and use other mapping and data analysis tools.

Funded by: Forest Service, NRCS.
Location: New York, NY.
Partners: Partnership of more than 30 Federal, State, and local agencies, private companies, academic institutions, and nonprofit organizations, including Forest Service, EPA, U.S. Geological Society (USGS), New York Dept. of Environmental Conservation, New York City Dept. of Environmental Planning, New York Restoration Project, and Trees New York.

OUTCOMES Model

http://www.fs.fed.us/ne/syracuse/Projects/OUTCOMES.zip

Description: Trees modify air temperature, solar and thermal radiation exchanges, wind, and humidity of the air, and all of these influence human comfort. A computer program has been developed to predict human comfort and evaluate the impact of trees on comfort. The program, OUTCOMES (OUTdoor COMfort Expert System), is a Windows® program that was written with the goal of providing an easy to use interface and ample on-screen help. OUTCOMES shows the shade pattern of a tree and calculates a human comfort index considering the full range of weather variables, the density of a tree that shades a person, and other features of the surrounding neighborhood.

Benefits: Trees influence solar radiation, wind speed, air temperature, and humidity. The program permits predictions of the combined tree influences on the weather variables for human comfort.

Funded by: Forest Service.
Location: Northern Research Station.
Partners: The SUNY College of Environmental Science and Forestry assisted in programming OUTCOMES.

Recycling Municipal Trees—A Guide for Marketing Sawlogs From Street Tree Removals in Municipalities

http://www.fs.fed.us/na/morgantown/frm/cesa/rmt/rmt_index.html

Description: The purpose of this guide is to increase the awareness of officials of municipalities regarding an alternative strategy for using their street tree removals; a "recycling" strategy, which can potentially turn a cost-burden scenario into an income-generating opportunity. The strategy involves

merchandising sawmill-size logs from street tree removals to sawmills or other companies that have unique uses for street tree logs.

Benefits: Recycling municipal trees by converting street tree removals to valuable sawlogs could potentially generate income as well as reduce the amount of time and labor costs involved in processing this material into firewood.

Funded by: Forest Service, NA.
Location: Forest Service, Morgantown, WV.
Partners: Forest Service, S&PF, New Jersey Forest Service, West Virginia University, School of Journalism.
Similar Resource: Utilizing Municipal Trees: Ideas from across the country. By Stephen Bratkovich, 2001. http://www.na.fs.fed.us/spfo/pubs/misc/umt/index.htm.

SEED

http://publicecology.org/seed/

Description: SEED is an open-source content management system and Web site development tool for use by civic and conservation organizations.

Benefits: It is designed specifically for building the capacity of local organizations and their networks (at local to global scales) to more effectively communicate amongst themselves and their target audiences to more effectively achieve their conservation goals.

Funded by: Forest Service.
Location: Public Ecology, Lynchburg, VA.
Partners: Forest Service, Public Ecology, and Virginia Tech.

SelecTree

http://selectree.cagr.calpoly.edu/

Description: The guide lists 1,481 trees with up to 49 attributes and more than 6,278 photos for 1,056 trees available from tree detail records. Search by tree attribute or by name.

Benefits: Provides users with a comprehensive list of tree species and their attributes to guide them to the proper species for their location/site.

Funded by: California Department of Forestry and Fire Protection, Forest Service.
Location: Urban Forest Ecosystems Institute, Cal Poly State University, CA.
Partners: California Department of Forestry and Fire Protection, Forest Service, PG&E, Caltrans, SafeTree, and Sempra Energy.

State Urban Forest Reports

Description: As part of the urban forest Resource Planning Act (RPA) assessment, State reports are being developed that detail tree and impervious cover and population characteristics for every community, county, and county subdivision. Each community is being graded on its cover characteristic and tree stocking levels; and areas of highest priority for tree plantings are suggested. Urban forest benefits at the State level are also detailed.

Benefits: Reports provide detailed cover and stocking information to aid in regional, State, and local urban forest planning and management decisions.

Funded by: Forest Service RPA program, U&CF Program, and the Northeastern Area.
Location: In progress, State reports will be released as the cover data becomes available from the USGS.
Partners: USGS, RPA, Washington Office U&CF, and NA.

STRATUM

http://www.itreetools.org/street_trees/introduction_step1.shtm

Description: STRATUM, a Street Tree Resource management and Analysis Tool for Urban forest Managers, uses tree inventory data to quantify the dollar value of annual environmental and aesthetic benefits: energy conservation, air quality improvement, CO_2 reduction, stormwater control, and property value increase. STRATUM is included in the i-Tree suite of tools.

Benefits: The tool is an easy-to-use, computer-based program that enables any community to conduct and analyze a street tree inventory. Baseline data can be used to effectively manage the resource, develop policy, and set priorities. Using a sample inventory or an existing inventory of street trees, this software enables managers to evaluate current benefits, costs, and management needs.

Funded by: Forest Service and The Davey Tree Expert Company.
Location: The Davey Tree Expert Company.
Partners: Forest Service, The Davey Tree Expert Company, National Arbor Day Foundation, and Society of Municipal Arborists.

TreeLink

http://www.treelink.org/

Description: The TreeLink Web site was created to provide information, research, and networking for people working in U&CF. For the researcher, the arborist, the community group leader, the volunteer—the purpose of the site is to inform, educate, and inspire.

Benefits: TreeLink serves as a knowledge repository and networking center for urban forestry professionals while providing outreach to land agencies, academics, green industry, and the general public.

Funded by: Forest Service.
Location: TreeLink, Salt Lake City, UT.
Partners: Forest Service, Bartlett Tree Experts, and The Kenerson Group.

TREEORD

http://www.mnstac.org/RFC/treeord_software.htm

Description: TREEORD is software for tree ordinance development.

Benefits: TREEORD enables cities to develop a tree ordinance that reflects the unique assets of their community. It contains a database of more than 1,800 clauses from more than 200 ordinances from throughout the United States. Cities tap into this information as they respond to the interview format of the software. The software is designed to be easy to use and covers many difficult issues related to setting up a Tree Board, handling planning and zoning conflicts, inventorying trees, managing responsibilities for tree maintenance, etc. It includes guidance on bringing together a constituency to develop and review the ordinance.

Funded by: Forest Service.
Location: Minnesota Tree Trust.
Partners: Forest Service and Minnesota Shade Tree Advisory Committee.

Treesearch

http://treesearch.fs.fed.us/

Description: Treesearch is an online system for locating and delivering publications by Research and Development scientists in the Forest Service. Publications in the collection include research monographs published by the agency as well as papers written by Forest Service scientists but published by other organizations in their journals, conference proceedings, or books. Research results behind these publications have been peer reviewed to ensure the best quality science.

Benefits: Before Treesearch, each of the regional Stations handled distribution of their publications differently. Now all new books, chapters, and articles beginning with January 2004 are available to the public in a standard format. Older publications will be added as rapidly as possible. At the start of 2004 the collection contained more than 7,000 publications, making it the largest freely available collection of online forestry research in the world.

Funded by: Forest Service.
Location: Forest Service, Washington, DC.

Trees in Our City PowerPoints

http://www.fs.fed.us/psw/programs/cufr/TreesInOurCity/

Description: These PowerPoints are a product of research that was conducted to identify barriers and obstacles that prevent the effective delivery of urban forestry technology and information. They are short 10-minute PowerPoints designed to be shown to local elected officials. They are being customized for the 19 climate regions using local data generated by the Center for Urban Forest Research.

Benefits: The results of the center's research, along with Everett Rogers' pioneering work on the art of persuasion, guided the development of these products. They allow supporters of urban

forests to better communicate the messages to their community leaders and take urban forestry to the next level.

Funded by: Forest Service.
Location: Center for Urban Forest Research, Davis, CA.
Partners: Forest Service, California Urban Forest Council, Crocker/Flanagan Marketing, Inc., and Hal Voege Consulting.

Trees—The Air Pollution Solution (Research Summary)

http://www.fs.fed.us/psw/programs/cufr/products/cufr_658_Air%20Research%20Summary_3-06.pdf

Description: Research summaries are four-page documents that provide a quick look at a research project, and its findings, in an easy-to-read, comprehensible format. This particular summary discusses the role trees play in cleaning the air and making communities healthier places to live. Other summaries from the Center for Urban Forest Research can be found at http://www.fs.fed.us/psw/programs/cufr/research_summaries.php.

- The Large Tree Argument—The case for large-stature trees vs. small-stature trees.
- Is all your rain going down the drain?
- Where are all the cool parking lots?
- Where's the fire?
- Green plants or power plants?
- Save dollars with shade.

Benefits: The publication provides knowledge on how trees clean the air and offers ways readers can expand the role of trees as pollution control devices.

Funded by: Forest Service.
Location: Center for Urban Forest Research, Davis, CA.
Partners: Forest Service, California Department of Forestry, Sacramento Air Quality Management District, and Sacramento Tree Foundation.

U&CF TT Web Sites

http://www.fs.fed.us/psw/programs/cufr/
http://www.na.fs.fed.us/urban/index.shtm
http://www.unri.org/
http://www.urbanforestrysouth.org/
http://www.interfacesouth.org/
http://www.interfacesouth.usda.gov
http://www.unl.edu/nac/

Description: Seven Web sites are specifically designed and operated as technology transfer Web sites. Each has a slightly different focus, but all provide a user-friendly, accessible, and relevant Internet site that helps their customers easily find the information and services they need. The primary audiences also differ somewhat, although it is generally agreed to target State foresters, State urban forestry coordinators, staff of nonprofit tree groups, and U&CF professionals, including researchers, State extension foresters, university service and outreach representatives, municipal arborists and urban foresters, and other urban foresters and arborists (consulting and commercial). Secondary audiences usually include staff and elected officials of local governments and their volunteers serving on tree boards or other advisory committees that deal with U&CF issues.

Benefits: The customers of these Web sites have instant access to a multitude of products and services on any one of the six sites. The sites are user friendly, products are of a low resolution to facilitate downloading, and customers can expect to find something new on a regular basis.

Funded by: Forest Service and various State and local agencies.
Location: Forest Service, Technology Transfer facilities.
Partners: Forest Service Northern, Southern, and Pacific Southwest Research Stations, Northeast Area S&PF, and TreeLink.

Urban Forest Effects Model

http://www.fs.fed.us/ne/syracuse/Tools/UFORE.htm
www.itreetools.org
www.ufore.org

Description: The Urban Forest Effects (UFORE) model (included in the i-Tree suite of tools) is designed to use standardized field data from randomly located plots and local hourly air pollution and meteorological data to quantify urban forest structure and numerous urban forest effects for cities across the world. The model currently quantifies the following:

- Urban forest structure by land use type (e.g., species composition, tree density, tree health, leaf area, leaf and tree biomass, species diversity).
- Hourly amount of pollution removed by the urban forest, and its associated percent air quality improvement throughout a year. Pollution removal is calculated for ozone, sulfur dioxide, nitrogen dioxide, carbon monoxide, and particulate matter (<10 microns).
- Hourly urban forest VOC emissions and the relative impact of tree species on net ozone and carbon monoxide formation throughout the year.
- Total carbon stored and net carbon annually sequestered by the urban forest.
- Effects of trees on building energy use and consequent effects on carbon dioxide emissions from power plants.
- Compensatory value of the forest, as well as the value of air pollution removal and carbon storage and sequestration.
- Potential impact of Gypsy moth and Asian longhorned beetle infestation.

Benefits: Ability to analyze urban forest structure and ecosystem services and values for any size area (individual tree, neighborhood, city, to statewide areas) in an easy and statistically valid way.

New tools in development for UFORE include the following:

- UFORE Hydro—estimates effects of tree and impervious cover changes on hourly stream flow and water quality.
- UFORE Population Projector—quantifies future tree cover, number of trees, diameter distribution, and tree benefits over a 100-year period based on user-defined mortality rates. Estimates the number of trees needing to be established annually to meet a user-specified tree cover goal in a sustainable fashion.
- UFORE Functional Species Selector—selects the most appropriate trees for an area given the user-specified desired functions desired for the trees.
- UFORE Mapper—A GIS-based program designed to display forest benefits, find the most appropriate locations to plant trees, and map future changes to urban forest benefits.

Funded by: Forest Service, Northeastern Area, U&CF Program, The Davey Tree Expert Company, and SUNY College of Environmental Science and Forestry.
Location: Northern Research Station, The Davey Tree Expert Company.
Partners: Forest Service Northeastern Area, U&CF Program, The Davey Tree Expert Company, SUNY College of Environmental Science and Forestry, National Arbor Day Foundation, and Society of Municipal Arborists.

Urban Forestry Carbon Sequestration

http://www.dnr.state.wi.us/org/aw/air/registry/quantexamples/example10.html

Description: The Urban Forestry Carbon Sequestration tool calculates direct carbon sequestration from tree growth. The tool displays total carbon sequestered (aggregated over all the years since the first tree was planted, available in the "Total Storage" field), and individual year carbon sequestered (this is the "Annual Increase" field). The individual year amount employs varying growth rates and survival rates for any population of up to six different categories of trees.

Benefits: With the workbook provided with the tool, all users have to do is enter the number and type of trees planted by year. From the sequestration page within the Excel tool, the user can then determine the amount of carbon sequestered over the years.

Funded by: Forest Service.
Location: Wisconsin Department of Natural Resources.
Partners: Wisconsin Department of Natural Resources, Forest Service.

Urban Forestry Images

http://www.designcenter.umn.edu/nucfac/

Description: The Metropolitan Design Center Image Bank is one of the largest free online image collections on the Internet. Approximately 26,000 photos are available for free. This collection is one of the first to systematically catalog a large collection of land use and urban design images.

Benefits: The Urban Forestry Images add to that resource and create online slide shows linked to downloadable images in the Image Bank to provide easy access for professionals and civic groups interested in locating images that can demonstrate the value of urban forestry and to connect to other collections of urban forestry related images and information.

Funded by: Forest Service, U&CF challenge cost-share program.
Location: University of Minnesota, Minneapolis, MN.
Partners: University of Minnesota, Metropolitan Design Center.

Urban Forestry Index (UFind)

http://www.urbanforestryindex.net/

http://www.UrbanForestrySouth.org is the national repository of this database and provided the mechanism for TreeLink (and anyone) to search the Web site remotely. The Southern Center also downloads and pre-processes the citations from the University of Minnesota Forestry Library.

Description: The Urban Forestry Index (UFind) is a database of current and historic urban forestry and arboriculture publications and other media that can be searched by topic, author, title, description, or keyword.

Benefits: The Urban Forestry Index provides one comprehensive place to search (searchable database) for informational resources that have been produced by a wide variety of organizations—in all types of formats. The goal is to increase awareness of urban forestry publications and other media, increase access to these materials, and prevent duplication of products that have already been developed. The database makes use of existing indices, when available, and existing Internet technology. The database can also support many users.

Funded by: Forest Service—Washington Office and Urban Forestry Centers.
Location: Coordinator is based at the Forest Service, St. Paul Field Office (MN).
Partners: Forest Service, University of Minnesota Forestry Library, and TreeLink.

Urban Natural Resources Institute (UNRI)

http://www.unri.org/

Description: Web site designed to facilitate scientific interactions and receive and address questions from the general public.

Benefit: Increased collaboration and ability to address questions.

Funded by: Forest Service Northern Research Station.
Location: Northern Research Station.

Urban Tree Cover and Air Quality Planning

http://www.treescleanair.org

Description: This Web site is dedicated to building the case for urban tree canopy cover inclusion in State Implementation Plans (SIPs). On this Web site are documents critical to (1) understanding the link between trees and air quality and (2) navigating the State air quality improvement planning process.

Benefit: The creation and preservation of tree canopy is an innovative strategy being proposed to improve urban air quality and thus help to meet Clean Air Act standards. This project provides a resource center for materials concerning the rationale and process of incorporating urban tree planting into SIPs. It also aims to foster the dialogue between policymakers, air quality regulators, foresters, individuals, and organizations interested in air quality improvement and community forestry.

Funded by: Forest Service.
Location: Northern Research Station.
Partners: Forest Service, National Tree Trust, Center for Chesapeake Communities, and The Davey Tree Expert Company.
Additional resource: Strategic Tree Planting as an EPA Encouraged Pollutant Reduction Strategy. http://www.fs.fed.us/ne/syracuse/Emerging%20Measures%20Summary.pdf.

Visual Simulation Kit

http://www.unl.edu/nac/simulation/index.htm

Description: The visual simulation kit consists of three distinct and complementary pieces. The first is CanVis, an entry-level, image-editing software program that enables resource professionals to create photorealistic simulations with minimal

computer skills. These simulations can be used to depict proposed conservation practices or urban forestry projects to assist in the planning and decisionmaking process. It runs on a Windows-based computer and requires a Pentium 166 MHz or faster processor with 32 MB of RAM or higher. The second component is the Visual Simulation Guide; a multimedia CD reference manual on how to use image-editing software to create visual simulations for natural resource planning. The guide provides instruction on how to plan a simulation project, acquire images, and accurately locate and size imported objects. The third component is a series of self-paced tutorial modules that guides the user through hands-on activities for developing skills necessary to create effective visuals.

Benefits: The software enables users to edit a scanned photograph or an image from a digital camera. CanVis includes tutorial videos, which show how to use each editing tool, and a collection of object libraries, which contain images of plants, agricultural features, people, wildlife, and park elements that can be quickly added to the base image.

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