FINAL REPORT
FOREST SERVICE GRANT NO. 05-DG-11052021-097
Period covered by this report: June 3, 2005 through November 30, 2006

NOTE: Please review the following information and revise/complete as necessary.

Issued to: ICLEI: International Council for Local Environmental Initiatives, USA Inc.

Address: 436 14th Street, Suite 1520, Oakland, CA 94612

Congressional District Number: 9

Project Name: Talking Trees: Integrating Urban Forestry into Local Government's Sustainability and Emissions Reduction Initiatives

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Please provide an abstract on your project and its results. This abstract will be posted on the NUCFAC internet site. (approximately 200 words or less).

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Through the Talking Trees: Integrating Urban Forestry into Local Governments' Sustainability and Emissions Reduction Initiatives project, ICLEI has worked closely with a group of local governments and forestry experts to develop and distribute a toolkit of outreach materials and tools to help local jurisdictions consider and include urban forestry as a component of their emissions reduction and sustainability programs. This toolkit includes fact sheets geared to a local government audience, case studies on successful urban forestry programs, guidance on including urban forestry in local emissions reduction plans, a resource guide, and a review of tools currently available to quantify the benefits that urban trees provide. This toolkit has been distributed to ICLEI's national network of local governments and debuted at a series of training sessions to educate local governments on the benefits of urban forestry. The toolkit is available on both of ICLEI's websites: www.iclei.org/usa and www.coolmayors.org as well as upon request.

Project objectives:

ICLEI's local government members frequently inquire about the proper method for accounting for the effects of urban tree cover and changes in tree cover within any jurisdiction's local climate protection plans. These local government practitioners need information on the tangible ways that urban forestry benefits local communities and relates to broader sustainability goals. The Talking Trees project has addressed this need by assisting jurisdictions in integrating, quantitatively and qualitatively, urban forestry into their emissions reduction and sustainability plans.

The objectives of the Talking Trees project were to:
- Bring information to a wide distribution of local governments to raise awareness of the benefits that urban trees provide in terms of carbon storage and sequestration, air pollution removal, energy savings, water runoff, and increasing social and economic sustainability.
- Develop a toolkit aimed specifically at the local government audience that provides leaders with the resources needed to make informed decisions about tree cover in their communities.
- Aid local governments in quantifying the impacts of their urban forestry decisions so that tree cover considerations can be better integrated into jurisdictions' emissions reduction and sustainability programs.

Objectives met successfully:

ICLEI met all project objectives successfully. These objectives were met through completion of the urban forestry toolkit, convening of training workshops for local government staff and officials, and provision of technical assistance to local governments regarding the inclusion of urban forestry in climate protection plans.

Toolkit Development
ICLEI completed development of the toolkit entitled "Talking Trees: An Urban Forestry Toolkit for Local Governments" in November 2006. This toolkit is designed to communicate the benefits of urban forests and provide policy guidance to enable municipalities to move toward achieving a sustainable urban ecosystem. Fact sheets about carbon dioxide, energy, air quality, water quality and runoff, economics, social benefits, and planting and maintenance describe the various benefits that urban trees provide in a form that is both understandable and informative. Three case studies describe innovative and successful municipal urban forestry programs. A best practices guide presents tips for effective program management as well as tree planting and maintenance. A quantification protocol discusses issues surrounding

inclusion of urban forests in emissions inventories and climate protection plans and how to account for urban forest benefits under ICLEI's existing emissions analysis protocols. A review of common tools available to local governments for management and quantification of urban forests offers perspective on the benefits and requirements of each tool. Finally, a series of resource links enables local governments to expand their research beyond the contents of this toolkit.

ICLEI developed the toolkit after first vetting the project scope with interested local governments to identify topics deserving inclusion and successful urban forestry strategies employed to date. In developing the fact sheets, policy guidance, review of available tools and resource links, ICLEI's research surveyed the best literature and experts available.

The urban forestry toolkit was distributed in draft form to those attending the three local government urban forestry training workshops (described below), and the final version was distributed to attendees electronically following these events. In addition, the toolkit was distributed via ICLEI's listsery to all staff and elected liaisons from over 200 local governments throughout the United States.

<u>Training workshops</u>
ICLEI convened three primary training workshops to educate local government staff and officials on the benefits of urban forestry and to engage them in discussions regarding effective urban forest management and the inclusion of urban forestry in local climate protection plans. All three of these workshops were co-funded through assistance received from the US Environmental Protection Agency for the convening of workshops to address urban heat island issues. ICLEI capitalized on the natural synergy between efforts to mitigate the urban heat island (UHI) effect and urban forestry projects (a primary UHI mitigation strategy) to maximize the value of these workshops for participants.

The first training workshop was held as a forestry session at ICLEI's North American Regional Congress in Chicago on July 13th, 2006. This session was considered to be a full success as reported by the participants. Approximately 27 local government officials took part in this session entitled, *Urban Planning Tools for Creating a Cooler, Greener Community.* This session received relatively high attendance among workshops at the Congress, indicating the desire of local government officials for more information on this topic. Participants included city and county governments from the United States and Canada, along with some representatives of other non-profits and state and federal agencies. The primary speakers included:

- Greg Ina, General Manager, The Davey Tree Expert Co. made a presentation on the tools that the U.S. Forest Service has that local governments can use in there emissions reduction and sustainability work to quantify the impacts of urban forestry. Specifically, his presentation focused on the i-Tree software suite, including how to use STRATUM, UFORE, and the Storm Damage Assessment Tool. As part of his overview of these tools he discussed how they were developed, data needs and outputs, and provided examples of how communities of various sizes could use these tools most effectively to expand their planning efforts to include urban forestry.
- Dr. David Sailor, Portland State University presented on the new urban heat island mitigation impacts screening tool (MIST). This tool has recently been released by the EPA. Local governments can use MIST to estimate the impacts that will come from efforts taken to reduce the urban heat island effect. He focused specifically on how an increase in urban vegetative cover can reduce temperatures, decrease energy use, and prevent the formation of ozone. His presentation also took a more general focus, looking at how urban design has environmental impact for a community and the impacts that warmer climates can have on energy use and smog formation.
- ICLEI staff also made a presentation on ICLEI's new urban forestry toolkit that has been developed under this grant. I general overview was provided on the toolkit, the information it contains, and how local governments can use it to advance their forestry programs as part of their emissions reduction and sustainability plans.

ICLEI convened a second urban forestry workshop in Miami, FL on October 30 th, 2006. This session was hosted by Miami-Dade County and attended by approximately 30 participants from the County and five additional local governments in the region. The agenda from this workshop is attached to this report. Speakers included:

- Dr. David Sailor of Portland State University presented on the new urban heat island mitigation impacts screening tool (MIST). This tool has recently been released by the EPA. Local governments can use MIST to estimate the impacts that will come from efforts taken to reduce the urban heat island effect. He focused specifically on how an increase in urban vegetative cover can reduce temperatures, decrease energy use, and prevent the formation of ozone. His presentation also took a more general focus, looking at how urban design has environmental impact for a community and the impacts that wanner climates can have on energy use and smog formation.
- Larry Kalkstein of the University of Miami presented on connections between extreme heat events and public health issues.
- Eva Wong of the US Environmental Protection Agency presented on the EPA's current programs and offerings related to urban heat island mitigation.
- Dr. Francisco Escobedo of the University of Florida presented on the benefits of urban forestry and the results of urban forestry studies conducted in Florida.
- Jose Montes of Murton Roofing presented on the results of green roof projects implemented in Florida.
- Garrett Fitzgerald of ICLEI presented on ICLEI's new urban forestry toolkit for local governments, and facilitated throughout the workshop.

ICLEI convened a third workshop in San Jose, CA on November 20 th, 2006. This session was hosted by the City of San Jose. This workshop received a smaller attendance of approximately 12 participants, but also resulted in deeper conversation amongst officials from the City of San Jose who identified the need for and agreed to form new partnerships cutting across municipal departments that all expect will help to improve the City's urban forestry efforts. The agenda from this workshop is attached to this report. Speakers included:

- Dr. Hashem Akbari of Lawrence Berkeley National Laboratory presented on the urban heat island effect and strategies local governments can adopt to mitigate the UHI effect.
- Kathy Diehl of the US Environmental Protection Agency Region 9 Office presented on EPA's current programs and offerings related to urban heat island mitigation.
- Peter Turnbull of the Pacific Gas & Electric Company and the Cool Roofs Rating Council presented on cool roofing strategies as tools for heat island mitigation.
- Connie Gallippi of the Sacramento Tree Foundation (STF) presented on Greenprint, STF's innovative urban forestry program. All participants discussed the Greenprint model and considered its potential applicability to the City of San Jose.
- Ralph Mize, Arborist for the City of San Jose, presented on the City's urban forestry efforts to date.
- Rhonda Berry, Director of the locally based community forestry organization Our City Forest, presented on her organization's efforts to plant trees throughout the San Jose community in partnership with the City.

In addition, ICLEI hosted heat island mitigation workshops in the cities of Tucson, AZ and San Diego, CA through separate funding sources into which ICLEI was able to integrate urban forestry as a significant component. These workshops were not planned under the original project proposal, but ICLEI was happy to have the opportunity to further engage local governments in the subject of urban forestry.

At a workshop in Tucson, ICLEI was able to bring Dr. Robert Brown, Landscape Architecture and Forestry Professor from the University of Guelph (Ontario, Canada), to make presentations at a series of three workshops. The audience for these events included city staff, members of the City Manager's Ex-

ecutive leadership team and members of the public and municipal advisory boards. His presentations focused on the benefits of urban forestry and methods for integrating tree cover into the city's urban fabric and were followed by discussions on modifying the municipal landscaping policy and the need for inter-departmental collaboration to improve vegetative cover in the city.

The San Diego workshop focused on using urban trees to slow stormwater runoff, reduce energy use. and cool urban temperatures. Presentations were made to city staff and members of the public on current projects and programs, future initiatives, and the city's new urban land cover modeling tool. Discussions focused on the need to better integrate the multiple initiatives being undertaken, more fully documenting in staff reports the benefits that trees provide to the community, and making quantification tools available to staff so that they can better analyze the impacts off their actions on the urban forest.

Technical Assistance
Throughout the course of the project, ICLEI provided technical assistance to local government officials on integrating consideration of urban forestry into local climate protection and sustainability initiatives. For example, ICLEI discussed protocols for integrating forestry efforts into emissions reduction plans with the City of Philadelphia, along with a number of additional local governments. ICLEI also provided guidance to local government participants on how to account for the climate protection benefits of urban forests during several web-cast software trainings on its emissions analysis software during the project period.

ICLEI also had the opportunity to participate in a green roofs training conference hosted by the City of Oakland. At this event, ICLEI led a session for the public on using vegetation for heat island mitigation. A strong component of this session was the benefits on tree planting as part of a holistic program for increasing green space in urban areas and the benefits of doing so.

Objectives not met:

All objectives of this project were met.

List the major research or policy findings of your project?

While this project was not designed to perform original scientific research, ICLEI produced a toolkit collecting and translating the results of past research in the field of urban forestry into policy-relevant guidance for local government audiences. The major original policy guidance offered within the toolkit concerns how to account for the benefits of urban forestry within local climate protection plans. In general, the toolkit recommends that building-related heating and cooling energy savings produced by urban trees should be accounted for where possible, while the carbon sequestration benefits of trees should often be omitted. For circumstances where local governments may choose to count these carbon sequestration benefits as equivalent emissions reductions, the toolkit offers advice on how to enter these benefits into ICLEI's existing emissions analysis software.

If not apparent in the above, or if your project did not involve research, how did the project increase the knowledge we have about urban forestry? How did/will the public benefit?

The urban forestry toolkit ICLEI has produced under this project contains fact sheets on the environmental, social and economic benefits of urban trees, management and maintenance policy guidelines, case studies on innovative model urban forestry programs, policy guidance on accounting for the benefits of urban forestry within local climate protection plans, a review of tools available to help local governments

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manage their urban forests, and links to additional helpful resources. By disseminating this toolkit to its network of over 220 US local governments, ICLEI will help cities and counties throughout the country to establish more effective urban forest management programs. The public will enjoy the environmental, social and economic benefits provided by urban trees as these programs are strengthened.

What recommendations might you make for community foresters or others who might benefit from your project?

"Talking Trees: An Urban Forestry Toolkit for Local Governments" contains a number of recommendations for community foresters and their local government colleagues regarding the development of local urban forestry programs and management of urban forests. Community foresters need to be able to communicate the benefits of urban forestry, use the right tools for management and quantification of the local urban forest based on resources available and program objectives, and operate under an effective internal program structure.

A healthy urban forest maintains benefits and services over the long term and is managed to maximize return on investment. The most efficient way to manage a municipal urban forest is to begin with a long-term management plan that outlines specific goals, procedures, costs, and benefits, rather than following a strictly reactionary and emergency management system. An urban forest management plan should be regionally focused and locally minded in order to be most effective.

While the ultimate goal of an urban forestry program should be to maximize the health and size of the urban forest, and thereby the benefits provided to the community, several subsidiary goals can help to achieve that objective: 1) Increase public involvement and environmental stewardship. 2) Develop a database of information that will help to define, detect, and predict the health and status of the urban forest. 3) Encourage inter-agency participation.

The toolkit also includes a planting and maintenance guide to help reduce long-term costs, increase the vitality of the urban forest, and decrease emissions released due to unnecessary maintenance activities. By allowing trees to have adequate growing space, future maintenance costs will be lowered and trees will be healthier, larger, and longer-lived. In the long run, healthy and sustainable urban forests will provide more environmental, social, and economic benefits. Highlights of this planting and maintenance guide include:

<u>Select Planting Locations Wisely:</u> 1) Give trees as much space as possible. 2) Look for innovative ways to incorporate green spaces. 3) Plant trees in wide soil bands between the curb and sidewalk; avoid planting holes and tree pits. 4) Plant trees in small groves to minimize stormwater runoff. 5) Maximize the use of pervious pavement. 6) Plant trees to help reduce vehicular traffic.

<u>Protect Your Soils:</u> 1) Provide one cubic yard of soil volume for every five cubic yards of crown volume of a mature tree. 2) Meet or exceed minimum width requirements of planting zone. 3) Use low fencing, bark mulch, or herbaceous plants should protect the soil underneath trees from compaction and erosion. 4) Use tree grates to allow for soil protection along with an increased pedestrian right of way. 5) Ensure that soils are healthy and aerated. 6) Use structural soils where appropriate.

<u>Save Energy by Planting Trees:</u> 1) West is best. 2) Let the sun shine in from the south. 3) Big trees are better. 4) Keep the air conditioner cool. 5) Direct winds up and over. 6) The more trees the merrier.

<u>Choose the Right Species:</u> 1) Plant the right species for the location. 2) Choose large shade trees. 3) Ensure the urban forest has a high diversity of species. 4) Plant native species. 5) Plant low-maintenance trees. 6) Reduce water consumption by planting drought-resistant species. 7) Plant trees that emit low

amounts of biogenic volatile organic compounds. 8) Choose trees that are in-leaf when precipitation is greatest to maximize water storage capacity and reduce run off.

Successful Maintenance Strategies: 1) Get volunteers to do the work! 2) Establish a graduated maintenance cycle that includes all trees in the municipality. 3) Prune early. 4) Reduce the use of maintenance activities that release emissions. 5) Protect trees in construction zones. 6) Survey trees for pest infestation and disease. 7) Create a list of local resources.

Other Innovative Strategies: I) Build recharge areas under parking lots and holding tanks and cisterns under playfields. 2) Allow for surface area ponds to accumulate water. 3) Construct riparian retention and treatment areas, or "rain gardens."

Attach copies of reports, publications or videos. If your work has been published (journals, popular press, etc.), provide where they have been published or reported and how copies can be obtained.

Attached is a copy of ICLEI's recently developed toolkit: "Talking Trees: An Urban Forestry Toolkit for Local Governments."

How were your results disseminated to the public?

ICLEI has electronically distributed the completed urban forestry toolkit to all participants of its urban forestry training workshops and to its network of local government liaisons via email listservs. It is available for download at www.iclei.org/usa and www.coolmayors.org

What are the logical next steps or future direction of your project/research?

ICLEI will continue to advise local governments on the consideration of urban forest programs within local climate protection planning efforts. In addition to refining and adding to the newly produced urban forestry toolkit as new information, tools and resources become available, ICLEI hopes to integrate an urban forest benefits quantification tool into its future emissions analysis software tools currently under development. ICLEI also hopes to convene future urban forestry training workshops for local governments to help foster the adoption of more effective urban forest management models throughout the country. During the next year, ICLEI would like to begin offering a web-cast virtual training on urban forestry to all interested local governments. Virtual trainings have the potential to reach large audiences while avoiding the costs associated with speaker and participant travel, time, etc.

List the active partners (key individuals or organizations) involved in the project:

ICLEI staff members Ryan Bell and Jennie Wheeler led ICLEI's work on this project. While ICLEI was the sole organization working to fulfill the deliverables of this project, ICLEI staff relied on surveys of local government members, a literature review and expert interviews to help guide the direction and content of both the urban forestry toolkit and training workshops. ICLEI is familiar with current research in the field of urban and community forestry and has good relationships with many experts in the field (e.g., staff at the Center for Urban Forestry Research and the USDA Forest Service Northeastern Research Station).

Photo or Illustration: If possible, please provide a photo or illustration for our use that summarizes or represents the project. Indicate how this illustration should be credited.

Attached are a three photographs taken at the October 30th, 2006 urban forestry training workshop held in Miami. FL. Below are crediting instructions for each of the three attached photos:

- ICLEI_MiamiWS_Sailor.jpg — Dr. David Sailor of Portland State University presents to local government officials at an urban forestry workshop in Miami, FL on October 30th, 2006. Photo courtesy of ICLEI — Local Governments for Sustainability
- ICLEI_MiamiWS_Wong.jpg — Ms. Eva Wong of the US Environmental Protection Agency presents to local government officials at an urban forestry workshop in Miami, FL on October 30th, 2006. Photo courtesy of ICLEI — Local Governments for Sustainability
- ICLEI_MiamiWS_Escobedo.jpg — Dr. Francisco Escobedo of the University of Florida presents to local government officials at an urban forestry workshop in Miami, FL on October 30th, 2006. Photo courtesy of ICLEI — Local Governments for Sustainability

If a no-cost time extension was granted for this project, why was it needed?

ICLEI requested a no-cost time extension for this project at the request of local government staff in Miami-Dade County in order to hold the Miami, FL training workshop later in the Fall to decrease the likelihood of potential hurricane activity during the week of the workshop. Our liaisons in the City of San Jose had also expressed an interest in postponing the San Jose, CA training workshop in order to secure their desired keynote speaker for that event, who was unavailable for our initially planned workshop date. Thus while we had been on course to hold both workshops before the original closing date of September 30th, the two-month extension enabled us to satisfy both host local governments and deliver better training workshops.

How would you evaluate the grant process? What changes, if any, would you recommend?

ICLEI is satisfied with the grant process.

Comments considered of importance but not covered above:

ICLEI staff would again like to thank the National Urban and Community Forestry Advisory Council and the U.S. Forest Service for their critical. ongoing support.

This report was prepared by:
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