

Request for Proposal

Urban & Community Forestry Rapid Assessment of Tree Damage Following Natural Disasters

Project Description

Southern Region urban forests are subject to significant damage from hurricanes and other natural disasters. The scale of these events may range from the neighborhood level to municipal, state, and multi-state (regional) impacts. Damage to urban trees threatens public safety and creates adverse economic consequences for state and local governments in the short-term (i.e. response) and the long-term (i.e. recovery of environmental services and/or loss of environmental services). State forestry agencies can play a key role in reducing the negative impact from these natural events by being actively involved in prevention, response, recovery, and re-greening strategies.

As part of each state's response to natural disasters that affect urban trees and forests, there is a need to support local managers and county emergency officials with timely information on the extent of damage to urban trees, as well as tools to help manage the response.

To support this project, the Southern Group of State Foresters (SGSF) and the U&CF State Coordinators in the southern region (AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA) are soliciting proposals to meet objectives and criteria outlined in this RFP.

The Urban Forestry South website (www.URBANFORESTRYSOUTH.ORG) will be the official clearinghouse for all products developed from this proposal.

The U&CF State Coordinators Storm Committee and the Southern Center for Urban Forestry Research & Information will be the primary working group and contacts for this project.

Objective

Develop a post-storm assessment methodology and [computer] model that will enable State Forestry Agencies, or equivalents, and the USDA Forest Service (Region 8) to rapidly determine the extent, severity, and nature of damage to Region 8 urban forests following wind storms (i.e. hurricane, tornado) in an efficient, timely, accurate, and precise manner.

The methodology and underlying model should help local, state and regional UF managers answer the question...

"How much urban tree damage occurred (from this storm event), where is it, and ¹what will it cost to repair, remove, and replace trees (or urban forest), and ²what will it cost to restore the lost ecosystem function? (i.e. the cost of long-term recovery)"

[Note: "Cost" may not have to be in \$\$, but could be yards of debris, number of replacements, canopy (LAI) loss and recovery over time; the local community would enter cost/unit to actually calculate \$\$ cost. (e.g. A model output may be a spreadsheet that communities could use to apply cost/unit and calculate costs for debris (FEMA), mitigation and recovery; or the community might have an option to enter cost/unit into the model.)]

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Project Details

- ❑ The proposal must clearly explain and document the:
 - methodology (or protocol) for making the assessment following a storm event,
 - ability to implement the methodology (or protocol) at various time intervals following the event,
 - operation of the methodology (or protocol) at various spatial extents,
 - the model input, operation and output,
 - expected elapsed time (and estimated cost) to implement, collect, process, and report an assessment,
 - additional resources needed to support the methodology and/or model (i.e. equipment, personnel, sub-contractors),
 - training requirements of this system to accomplish "in-house".
- ❑ The protocol and model developed from this proposal must function at spatial extents from the local community to the region (i.e. multi-state); e.g. 1-2,000 square miles)
- ❑ The protocol and model developed from this proposal must function efficiently and accurately during any post-storm event timeframe (e.g. 24/48 hours, 7 days, 30 days, or 6 months),
- ❑ RFP must clearly indicate how this methodology will address assessment issues related to access immediately following the storm event (e.g. FEMA, state national guard, or local jurisdiction control of the disaster area); therefore the protocol and model developed from this proposal must rely on minimal on-site data collection (i.e. ground truthing) particularly in the timeframe immediately following the storm event when ground access may be limited,
- ❑ The proposal is not intended to provide an assessment of individual trees (e.g. for risk or damage), but instead assess damage for the urban forest at the landscape scale,
- ❑ The proposal must clearly explain the underlying statistical and scientific basis for the model being proposed or developed,
- ❑ RFP should explain collaboration (e.g. expertise, data, research) with other relevant agencies and organizations to design and develop a methodology and model that blends various natural resource assessment technologies with appropriate weather and related technology (i.e. NOAA, NASA, US Geological Survey),
- ❑ Model output should provide debris, damage (pruning) and destroyed (removal) tree estimates to support FEMA at various levels,
 - The assessment model will produce reports at varying spatial extent (i.e. local, state, and regional) that are simple, easy to read, and graphic. For example, it should include an outline of the area, with zones indicating damage using a ranking system. The report could show the assessed storm damage using a scale of 1-5, with five being the most severe urban forest damage (in terms of various metrics). Each code would have a specific and constant definition. The area map would show where, if any, zones are located for each of these numbers. The report should also include tables that itemize debris, replacements and environmental services (canopy loss) by zone.

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- At the state or regional level, a table would list the communities found in each of the "5" zones. A second table would list appropriate actions (once again by zone) state forestry agencies, and equivalents should take in response to the storm. Graphics on the report should be in a format that allows each state to copy and paste into other informational materials (i.e. state agency websites, boards, presentations).
- ❑ Output metrics should include: estimates of debris volume from removals and pruning, canopy loss in terms of LAI or similar measurement, and the restoration of canopy over time,
- ❑ The RFP solution should be based on recent storms in the southern region (i.e. past 5 years),
- ❑ RFP should identify any iTree component connections, and/or enhancements of iTree components to better support this model,
- ❑ The model should also allow states and the USDA Forest Service to use the assessment in their communications with FEMA, Forest Service Washington office, State Foresters (or equivalent), Congress, Congressional delegation, and State Governor. Specific reporting requirements will be developed by the State U&CF Coordinator Storm Committee,
- ❑ The RFP should outline (i.e. with timeline) the development of the assessment model with particular emphasis on the involvement of the U&CF State Coordinator Storm Committee and the USDA Forest Service (e.g. development review, comment periods, beta testing).

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Photo 1: Example of the type of storm damage that we want to determine locally to support local, state and regional disaster recovery. Source: US Army Corps of Engineers 2005/2006 (Rita)

Proposals, Selection and Project Initiation

The Storm Committee will evaluate proposals that meet the following requirements:

1. outline the methodology proposed to meet our stated objectives,
2. address *Project Details* presented in this RFP,
 - a. indicating any multi-year, phased development of project components,
3. present a timeline for the work,
4. present a budget for the work,
5. discuss the qualifications of the project principals,
6. are received **on or before August 1, 2006**

Proposals will be evaluated prior to August 22, 2006 at which time a research team/teams will be selected. Selection may be based on negotiation with suitable and qualified research teams on the criteria, output, products, and delivery.

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Initial funding is currently available: the successful research team can expect to begin the project by October 24, 2006. Delivery of the project methodology should be targeted for use in the 2007 hurricane season (June 1, 2007).

Contact information

You may contact either of the following with questions regarding this RFP:

Dudley R. Hartel, Center Coordinator
Southern Center for Urban Forestry Research & Information
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(706) 559-4236 (o)
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RFP Submission

Proposals are due on or before August 1, 2006.

An electronic copy is required.

Proposals may be submitted electronically via e-mail or delivered (mail or FedEx) to:

Dudley R. Hartel, Center Coordinator
Southern Center for Urban Forestry Research & Information
320 Green St
Athens, GA 30602
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Appendix - Project Submitted to SGSF (June 2005)

Project Title:

Developing Tools to Help State Forestry Agencies Prepare, Assess and Respond to Storm Damaged Urban Trees

Regional Relevance:

Storms and urban forests are a way of life in the southern region. There will always be a need and demand for state forestry agency to provide meaningful services. The accomplishment of this project would standardize how each state forestry agency would address storm damaged urban forests issues in the southern region. States would be able to collaborate when storms cross state lines. This would result [in] more efficient use of resources while providing relevant state services to urban taxpayers and local governments.

Rapid Damage Assessment

Develop a system that uses remote sensing technology to estimate tree damage in the immediate aftermath of a storm. Better assessments could make the difference between qualifying for FEMA public assistance and bearing cleanup costs alone. The assessments could also help state forestry agencies and local governments better utilize their resources in restoring and replacing storm damaged urban forests. This system should integrate three things: remote-sensing *maps* of affected areas, *field data*, and ultimate *debris volumes*. This can be accomplished two ways:

1. Review the recent past – Select one or more communities that were affected by one of the four hurricanes to hit Florida and Alabama in 2004 and try to develop the correlation between windfield data (NOAA), actual damage (maps, imagery), and debris streams (FEMA data).
2. Plan for the present – Given the current Atlantic hurricane cycle we are in, a major storm is likely to affect one of the 13 Southern states in the near future. But every year, communities in each of our states experiences storms on a smaller scale. Over the next year, we should prepare to use this emerging technology as a “case study.” After the storm strikes, we should respond by creating maps of affected areas, analyzing the urban tree losses through field measurements, and helping the community calculate debris streams and costs. A contractor, combined with a small team of urban coordinators could perform this work.

Debris Management Tools

Develop standard tools to manage and track storm debris from urban trees for communities of all sizes, and train urban foresters in the South to use them. Regardless if local managers know the extent of damage to community trees, they still have to pick up the pieces and take them somewhere. The smaller the community, the less likely they are to have such capacity. State forestry agencies can help by providing effective tools and providing training to local managers.

Website Clearinghouse

Develop a website devoted to storm information for the South that would bring together in one place the information that local tree managers, emergency management officials, and state forestry personnel need to prepare for and respond to natural disasters.

[RFP Note: SGSF proposal language in blue is relevant to this proposal.]

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Appendix- Definitions:

Damage Assessment	The process used to appraise or determine the number of injuries and deaths, damage to public and private property, and the status of key facilities and services such as hospitals and other health care facilities, fire and police stations, communications networks, water and sanitation systems, utilities, and transportation networks resulting from a man-made or natural disaster. <small>(SLG 101: Guide for All-Hazard Emergency Operations Planning (9/96))</small>
Hazard	Something that is potentially dangerous or harmful, often the root cause of an unwanted outcome. <small>(http://www.fema.gov/nimcast/Glossary.do Updated: Tuesday, 02-Aug-2005 22:07:28 EDT)</small>
Hazard Mitigation	Any action taken to reduce or eliminate the long-term risk to human life and property from hazards. The term is sometimes used in a stricter sense to mean cost-effective measures to reduce the potential for damage to a facility or facilities from a disaster event. <small>(SLG 101: Guide for All-Hazard Emergency Operations Planning (9/96))</small>
Incident	An occurrence or event, natural or human-caused, that requires an emergency response to protect life or property. Incidents can, for example, include major disasters, emergencies, terrorist attacks, terrorist threats, wildland and urban fires, floods, hazardous materials spills, nuclear accidents, aircraft accidents, earthquakes, hurricanes, tornadoes, tropical storms, war-related disasters, public health and medical emergencies, and other occurrences requiring an emergency response. <small>(http://www.fema.gov/nimcast/Glossary.do Updated: Tuesday, 02-Aug-2005 22:07:28 EDT)</small>
Mitigation	The activities designed to reduce or eliminate risks to persons or property or to lessen the actual or potential effects or consequences of an incident. Mitigation measures may be implemented prior to, during, or after an incident. Mitigation measures are often informed by lessons learned from prior incidents. Mitigation involves ongoing actions to reduce exposure to, probability of, or potential loss from hazards. Measures may include zoning and building codes, floodplain buyouts, and analysis of hazard-related data to determine where it is safe to build or locate temporary facilities. Mitigation can include efforts to educate governments, businesses, and the public on measures they can take to reduce loss and injury. <small>(http://www.fema.gov/nimcast/Glossary.do Updated: Tuesday, 02-Aug-2005 22:07:28 EDT)</small>
Preliminary Damage Assessment	A mechanism used to determine the impact and magnitude of damage and the resulting unmet needs of individuals, businesses, the public sector, and the community as a whole. Information collected is used by the State as a basis for the Governor's request for a Presidential declaration, and by FEMA to document the recommendation made to the President in response to the Governor's request. PDAs are made by at least one State and one Federal representative. A local government representative familiar with the extent and location of damage in the community often participates; other State and Federal agencies and voluntary relief organizations also may be asked to participate, as needed. <small>(SLG 101: Guide for All-Hazard Emergency Operations Planning (9/96))</small>
Preparedness	The range of deliberate, critical tasks and activities necessary to build, sustain, and improve the operational capability to prevent, protect against, respond to, and recover from domestic incidents. Preparedness is a continuous process. Preparedness involves efforts at all levels of government and between

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government and private-sector and nongovernmental organizations to identify threats, determine vulnerabilities, and identify required resources. Within the NIMS, preparedness is operationally focused on establishing guidelines, protocols, and standards for planning, training and exercises, personnel qualification and certification, equipment certification, and publication management.
(<http://www.fema.gov/nimcast/Glossary.do> Updated: Tuesday, 02-Aug-2005 22:07:28 EDT)

Prevention	<p>Actions to avoid an incident or to intervene to stop an incident from occurring. Prevention involves actions to protect lives and property. It involves applying intelligence and other information to a range of activities that may include such countermeasures as deterrence operations; heightened inspections; improved surveillance and security operations; investigations to determine the full nature and source of the threat; public health and agricultural surveillance and testing processes; immunizations, isolation, or quarantine; and, as appropriate, specific law enforcement operations aimed at deterring, preempting, interdicting, or disrupting illegal activity and apprehending potential perpetrators and bringing them to justice. (http://www.fema.gov/nimcast/Glossary.do Updated: Tuesday, 02-Aug-2005 22:07:28 EDT)</p>
Recovery	<p>The long-term activities beyond the initial crisis period and emergency response phase of disaster operations that focus on returning all systems in the community to a normal status or to reconstitute these systems to a new condition that is less vulnerable. (SLG 101: Guide for All-Hazard Emergency Operations Planning (9/96))</p>
Response	<p>Activities to address the immediate and short-term effects of an emergency or disaster. (FEMA)</p>
Response	<p>Activities that address the short-term, direct effects of an incident. Response includes immediate actions to save lives, protect property, and meet basic human needs. Response also includes the execution of emergency operations plans and of mitigation activities designed to limit the loss of life, personal injury, property damage, and other unfavorable outcomes. As indicated by the situation, response activities include applying intelligence and other information to lessen the effects or consequences of an incident; increased security operations; continuing investigations into nature and source of the threat; ongoing public health and agricultural surveillance and testing processes; immunizations, isolation, or quarantine; and specific law enforcement operations aimed at preempting, interdicting, or disrupting illegal activity, and apprehending actual perpetrators and bringing them to justice. (http://www.fema.gov/nimcast/Glossary.do Updated: Tuesday, 02-Aug-2005 22:07:28 EDT)</p>
Risk	<p>The probability of harmful consequences, or expected loss (of lives, people injured, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human induced hazards and vulnerable/capable conditions. Conventionally risk is expressed by the equation Risk = Hazards x Vulnerability/Capacity. (U.N. ISDR 2002, 24)</p>