Urban Tree Risk & Disasters

Assessment, Planning, and Recovery

The Forestry and Natural Resource Webinar Portal
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Presentation Outline

- Why Urban Tree Risk Management – the big picture
- Collaboration opportunities for UF and EM
- Urban Forestry & Risk & Disaster Planning
- UTRI Model
- Debris Management
  - Staging areas utilizing UTRI
- Vegetation Risk Management Plan- outline
- Next Steps

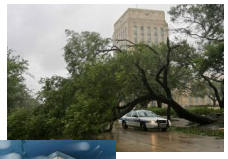
Why Urban Tree Risk Management






The Need?

- Impede 911 and Emergency Response
- Structural Damage & Impede access to Critical Infrastructure facilities




The Need?

- Emergency Management Costs



Get Connected with local Emergency Manager




Collaborative Strategies

- How to incorporate urban forestry into Emergency Management and Debris Management
  - Meet FEMA standards for mitigation, planning, response, and recovery ***AND*** arboriculture industry performance standards

The Big Picture

Structure	Data	Urban Forester Involvement
	General	
State	*Vegetative*	Partnership/Planning
Regional		
County		
Community	*Tree Risk*	Hands on Implementation
	Detail	

Opportunities

Examples

- Comprehensive Plan
- Hazard Mitigation Plan
- Emergency Response Plan and Exercises
- Debris Management Plan
- **Vegetative Risk Management (the New link)**
- UF Management Plan
- Tree Risk Management Plan(s)

Risk Mitigation Results

- Reduced claims as they relate to trees by 72%
- Reduced work order complaints and/or request for services by over 55%
- Reduced 911 and overtime expenditures for tree cleanup by over 69%

Five year period 2001-2006
Columbus, Georgia (R. Barker)

Mitigation/Planning

- **Identifying critical infrastructure to include vegetation at critical facilities –** Evaluate and mitigate as necessary
- **GIS mapping** – Identify potential high debris and hazard areas. Where is the highest potential for vegetative removal and your hazard areas ranked from highest to lowest
- **Debris estimation** – Utilizing street segments and random sampling after an event and other methods
- **Exercises**- Utilize UTRI data & model for disaster exercises – prioritized response for Public Works personnel and prioritization of resources

Mitigation/Planning

- **Pre-hazard mitigation planning** – Mitigate by pruning/removal and scheduled inspections of identified areas
- **Debris Management Plan** – Utilize UTRI GIS tool to identify staging areas for debris that is closest to the areas with most potential for debris (Canopy % by street segment)
- **Local ordinances** – Analyze and development of ordinances such as tree planting requirements on major corridors and emergency routes

Response

- **Identifying critical infrastructure-** Prioritize response to high hazard areas and routes
- **Staging areas for debris** – Utilize UTRI tool
- **Debris estimation** - Identifying high hazard areas and utilizing street segments for random sampling in debris estimation models
- **UFST** -Urban forestry strike teams – US FS trained for Debris estimation utilizing FEMA 325
- **MOU's** – Samples - Virginia

Recovery

- **Debris management protocol -** High Hazard areas will most likely produce highest amounts of debris. Plan accordingly
- **Insect/disease and invasive species separation and management protocol** – Utilize a VRMP and the UTRI model to develop and opportunity to include these protocols
- **Pruning and/or removal-** as determined by identified areas and based off of evaluation and inspection

Recovery

- **Replanting** – BMPs for planting the right tree in the right spot
- **Education** – Proper pruning and planting – (See FEMA BMP's Examples: Pre-emptive Pruning: Tree Trimming as a Damage Reduction Measure and others)

Who Works With & Manages Community Trees

- For a comprehensive list of "Who Works With and Manages Community Trees" – See the Society of Municipal Arborists www.urban-forestry.com website and look for the BMP series Green Communities are $mart Communities

Local Collaboration

Have you collaborated with another professional - Urban Forester or Emergency Manager - in regard to trees and disasters in your community or communities you work with?

- **Yes**
- **No**

Urban Tree Risk Management

- **Urban Tree Risk Management**
  A Community Guide to Program Design and Implementation

Contributing Editor:
Jill Pokorny, USDA Forest Service
St. Paul, MN (NA-TP-03-03)

Tree Risk Management

Communities can deal with risk in several ways:

1. Risk Avoidance
2. Risk Management

Your community decides how to manage trees to reduce risk and prepare for disasters.

It is **NOT** necessary to practice risk avoidance in order to be better prepared for disasters.

Risk Management Program Design

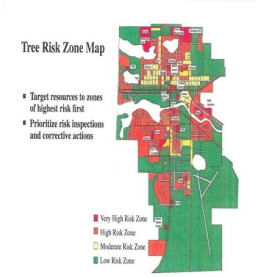
A Ten Step Process

1. **Assess the tree resource**
2. Review current management practices
3. Assess fiscal and human resources
4. **Identify program goals**
5. **Formulate a tree risk management strategy**
6. **Prioritize inspection and corrective action**
7. Select a tree rating system
8. Write a comprehensive risk policy
9. Implement the tree risk management strategy
10. Evaluate program effectiveness

Inspection Guidelines and Schedule

Table 2.2. Suggested minimum guidelines for inspection methods and inspection schedules within a community tree risk management program.

Hazard Categories	Color Codes	Timing of Inspections	Suggested Inspection Method	Comments
Very High	Red	Annual	Walk-by/ individual Tree inspections	
High	Orange	1-2 years	Walk-by/ individual Tree inspections	
Moderate	Yellow	3-5 years	Walk-by/ individual Tree inspections	Consider conducting a drive-by/windshield survey on an "off-year" when individual tree inspections are not scheduled.
Low	Green	5-7 years	Walk-by/ individual Tree inspections or Drive-by/ Windshield Surveys	
All Rated Zones	NA	After Severe Storms	Drive-by/ Windshield Surveys	If potentially hazardous trees are detected, follow-up with individual tree inspections



Tree Risk Plan: Support

- Urban forest management
- Other municipal staff (roads, parks, sidewalks, electric)
- Local Emergency Management
- Elected officials
- Residents

Urban Tree Risk Management

How many of you, regardless of profession (planner, emergency manager, urban forester, arborist, municipal staff), are directly involved with a tree risk management program in your community?

a) Not at all
b) It has been discussed
c) We have started a tree risk management program
d) This is a totally new concept for me

What Next?

Now we know the ***WHY* (The Need)** and the ***WHO* (*Collaboration*)**

***HOW* (VRMP)**and ***WHAT* (UTRI)** do we need to do:

- Reduce the impact of storms on the urban forest
- Lessen personal injuries and property damage
- Decrease emergency management costs

UTRI "the fast track"

- Urban Tree Risk Management
- Vegetation Management – Big Picture
- Urban Tree Risk Index (UTRI) GIS tool

A tool for working with Emergency Managers and preparing for disaster

Tree Risk & Disaster

Identify & Assess:

- region of interest (county, multi-county)
- important facilities to support disaster response
- access routes (to, from, and within)
- population centers (day and night)
- presence of tree canopy

Process & Outcomes:

- cursory and detailed assessments
- disaster & safety mitigation
- improved public safety
- reduction in "problems" & improved response

GIS Model Approach

The UTRI (Urban Tree Risk Index tool)

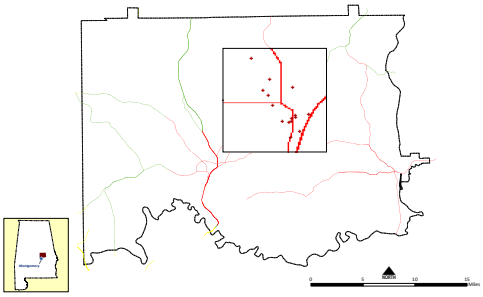
- **Identify Canopy Cover** on public roadways and property (critical facilities)
- **Field verification**: Provide a form for verification, assessment and mitigation completed
- **Tree management needs** to reduce risk; such as routine pruning in high tree density areas vulnerable to damage
- **Mitigation**: Identify areas prior to events for mitigation and where corrective actions should be implemented on an expedited basis – street segments
- **Inspection frequencies**: Identify zones for setting tree and vegetation inspection frequencies & schedules

UTRI Model

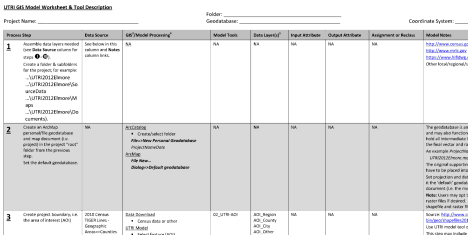
- GIS to model tree risk zones
  - Tree layer (canopy) [potential failure]
  - Transportation layer [target zone]
  - Facility layer [target zone]
  - Population density [target]
- Process
  - Assemble data
  - Vector to Raster
  - Summation of assigned values

UTRI – Elmore County (AL)

Urban Tree Risk Index Critical Facility Access



UTRI – Step by Step

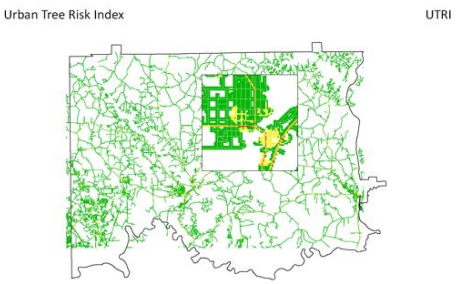


A series of presentations will begin November 12th to provide more detailed information and instructions.

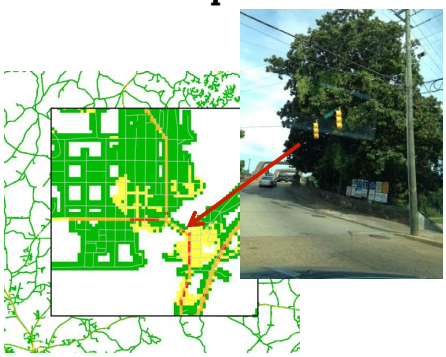
UTRI Model Products

- Worksheet with Right of Way Road Segments listed by priority (very high, high, moderate, and low)
  - Utilize for initial tree evaluations, mitigation steps recommended and completed
  - Utilize for Inspection schedules for road segments as outlined in the Vegetative Management Plan
- Using prioritized risk zones
  - Reduce potential for woody debris
    - On-site block/tree assessments
    - Prune
    - Remove
    - Sampling strata debris estimation
  - Pre-locate debris sites

UTRI – Elmore County (AL)



UTRI – Wetumpka



UTRI – Worksheet Example

Map ID	Street	Left-From	Left-To	Right-From	Right-To	UTRI	Length (Feet)	Field Check Verify Index	Prune	Post-Mitigation Remove	Post-Mitigation UTRI	Comments
563	Chapel Lakes Dr					15	118					
410	Chapel Lakes Loop					15	1063					
532	Chapel Rd	54	2	55	1	15	186					
292	Chapel Rd	69	95	68	94	15	9					
214	Chapel Rd	97	99	96	98	15	26					
489	Chapel Rd	101	129	100	128	15	118					
44	Chapel Rd	131	161	130	160	14	428					
379	Coosa River Pkwy					15	186					
204	Holtville Rd	1117	1233			15	71					
246	Holtville Rd	1235	1309	1234	1310	15	71					
354	Tallassee Hwy	128	356	129	357	15	348					

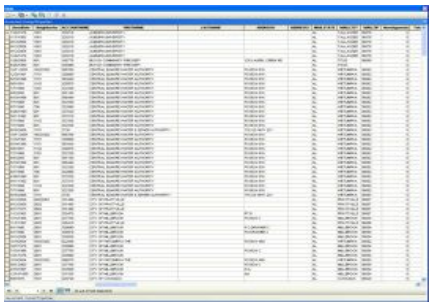
Debris Management

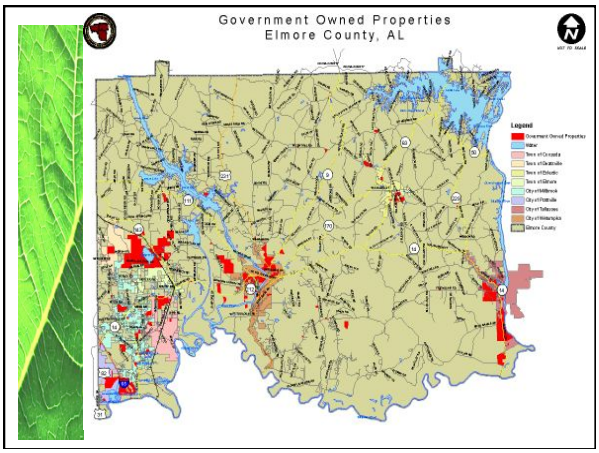
Have you worked on a debris management plan for your community/county?

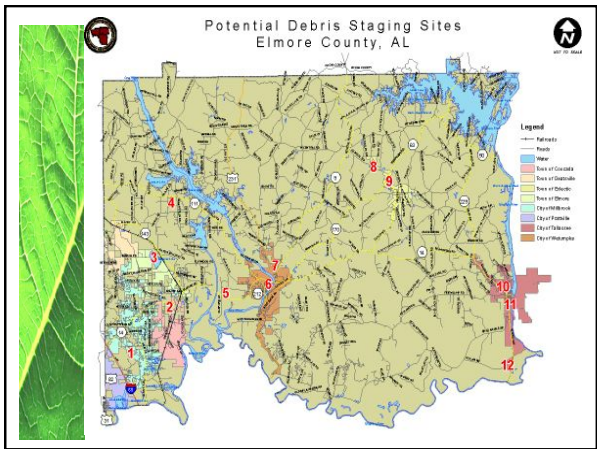
- Yes
- No

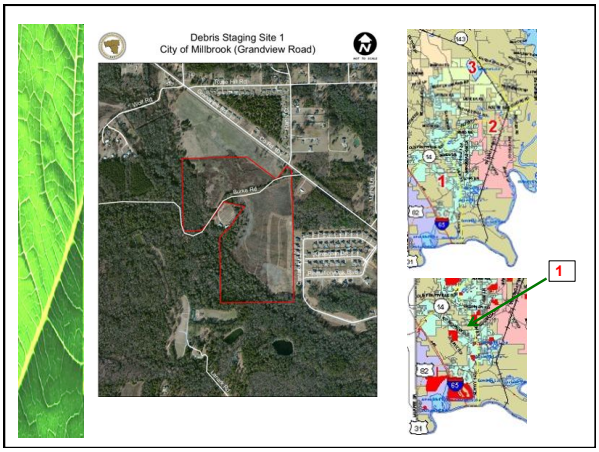
Debris Management

Staging Areas









Vegetation Risk Management Plan (VRMP)

- Overview county
- UTRI –The GIS Tool outcomes
  - Summary of layers
  - Areas of assessment and mitigation by table
- Outcomes
  - Areas sorted by table and reference to "Guide" for evaluation and timing of each area for evaluation and mitigation necessary
  - Example of debris staging areas
  - Collaboration strategies
- Next Steps

VRMP - Highlights

- **Overview county**
- **UTRI**
  - Summary of layers
  - **Areas of assessment and mitigation by table**
- **Outcomes**
  - **Future evaluation and assessment schedule for UTRI defined areas - referenced to the "Guide" for timing of each area for evaluation and mitigation necessary**
  - Example of debris staging areas
  - Collaboration strategies
- **Next Steps**

Areas of Assessment and Mitigation Necessary

Map ID	Street	Left-From	Left-To	Right-From	Right-To	UTRI	Length (Feet)	Field Check Verify Index	Prune	Remove	Post-Mitigation UTRI
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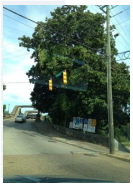

Future Evaluation & Assessment Schedule

- References Urban Tree Risk Management Guide – US Forest Service
- Timing for possible mitigation

Inspection Guidelines and Schedule

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Next Steps

- Update the VRMP every five years in conjunction with the Hazard Mitigation Plan
  - *The mitigation planning requirements of 44 Code of Federal Regulations, Section 201.6 (d) (44 CFR 201.6(d) require that local hazard mitigation plans must be reviewed, updated to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and reapproved every five ears for local jurisdiction to be able to receive hazard mitigation funding*

More Information

October 22-24
- Alabama Planners & Municipal Managers, Point Clear, AL
  Presentations: UTRI & VRMP and BMP in response

November 12-13
- Society of Municipal Arborists, Sacramento, CA
  Workshop (3 hours): UTRI

November 20
- Urban Forestry South
  Webinar: UTRI – Getting Started & Data and data preparation

November 23
- Urban Forestry South
  Webinar: UTRI – Risk zones, assessments, and mitigation

December 12
- Urban Forestry South
  Webinar: UTRI – VRMP and Debris management

January 14-15
- Alabama Planners Association, Florence, AL
  Presentations: URTI &VRMP

January 22-24
- Indiana Arborist Association, Indianapolis, IN
  Presentation: Urban Tree Risk Management & ANSI A300

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