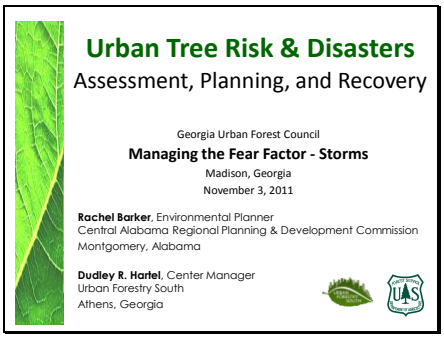
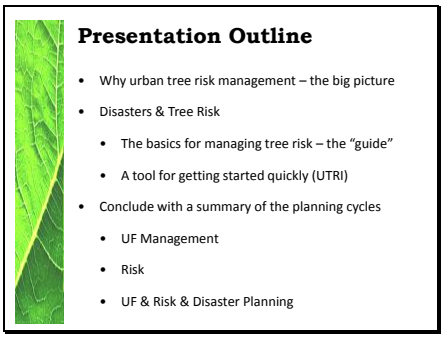
Slide 1



How many of you (urban forest or city managers) have taken steps to reduce (eliminate?) your communities' urban tree vulnerability in the next big disaster?

CARPDC = Central Alabama Regional Planning & Development Commission
EM = Emergency Management (state or local)
FEMA = Federal Emergency Management Agency (Homeland Security)
HSIP = Homeland Security Infrastructure Project [i.e. GIS data]
NAIP = National l Agriculture Imagery Program
NLCD = National Land Cover Database
UF = Urban Forester(ry)
UFS = Urban Forestry South (USDA Forest Service in Region 8)
UTRI = Urban Tree Risk Index

Slide 2



In this presentation we will discuss…

- urban tree risk management – the basics (10 steps)
- a GIS approach to "jump starting" or "fast track" UF management
- the role urban forest managers (and management) have in local disaster planning,
- improve the local disaster response/recovery with tree mitigation

Slide 3

The fact of the matter is….Urban Forestry meets Emergency Management time and time again.

Although each profession is not totally aware of the other and the role each plays.

We use a different language when referring to the same thing …

Our "Trees" are referred to by Emergency Managers as:

- "potential debris" if a standing tree or
- "debris" if a tree that is on the ground.

Our "Trees" are "vegetation" to the Emergency Manager and are **not managed the same by them as they are by us.**

Slide 4

There is a need to build relationships and partnerships with Emergency Managers.

We meet time and time again…. In all seasons… at all hours… in all kinds of different situations Trees and Vegetation are our common link.

Slide 5

How can we help Emergency Managers and Urban Foresters work together to lessen personal injury and property damage?

How can we work together to keep access to critical infrastructures like hospitals, fire departments, police departments, water treatment facilities, and waste water facilities open?

Slide 6

How can we work together to reduce the amount of debris after an event which will decrease emergency management costs and reduce the impact of major storms on the urban forest.

Slide 7

Get Connected to your Local Emergency Manager.
This is a great way to jump start a fledgling UF program or enhance an existing program by building in Urban Tree Risk Management.

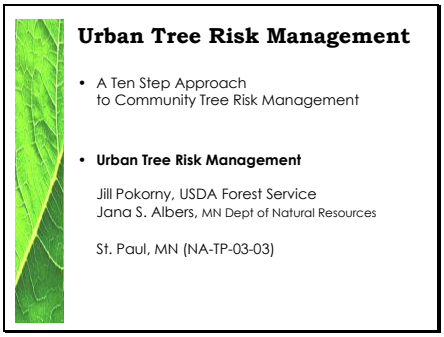
You have much to offer your Emergency Manager.

A well managed urban forest can:

- reduce injury/claims
- limit damage to critical infrastructure
- reduce clean up costs
- improve overall UF management response (eliminate the "putting out fires" mode)

By developing Urban Tree Risk Management Plans we can bring our profession to their table to help them meet a need (safey and reduced cost of clean-up) while improving the overall health of our urban forest and building our program's worth.

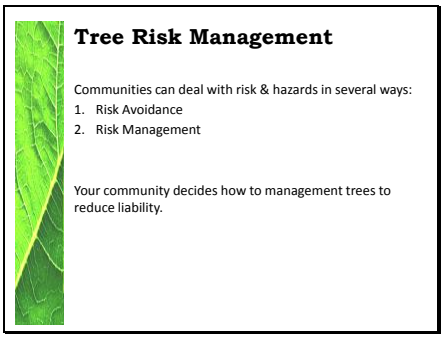
Slide 8



In this part of the presentation I will cover the 10 steps outlined in Chapter Two of the "Urban Tree Risk Management" manual.

Urban tree risk management is a necessary and logical starting point for disaster preparedness.

Slide 9



Cities that choose risk avoidance will eliminate all risks in the area of interest; others will manage [tree] risk so that benefits of the trees can be retained at some acceptable level of risk.

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

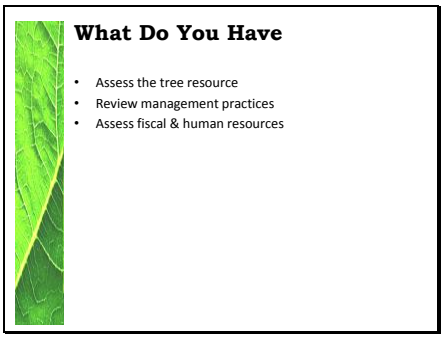
Slide 10

The 10 steps to tree risk management; a detailed presentation outline.

The Urban Tree Risk Index (UTRI) that we discuss later in the presentation is a modification of this approach to provide important vegetation and debris information necessary to a local disaster plan.

Steps 1, 4, 5, 6 implement the UTRI model for urban tree risk management to support local EM.

Slide 11



- A risk management plan does not a have to be a detailed tree assessment; the “big picture” is OK.
- But, can be the same baseline that supports your UF management plan. With some additional information.

- May need to determine value to justify the risk and management strategies; i-Tree Eco, Streets

- Assess the tree resource
- A planning element & assessment:
- Recent data (current inventory)
- Can be complete inventory or sample
- Baseline study to collect general information:
- species
- size classes
- condition (risk associated)
- maintenance needs (pruning, removal) & cost
- Urban forest value (i-Tree Eco/Streets)

- For urban forest management:
- Written policy
- Plans
- Ordinances
- Goals & strategies
- particularly relating to public safety
- Look across all for common goals
- look at other community departments

- Review current tree care budget:
- Look at estimated costs from your assessment
- Deficient?
- Include costs/resources for inspections
- Mitigation at “higher” level
- Improved establishment & young tree care as part of risk management

Slide 12

Locally, develop a "picture" of your community tree risk management program.

Disaster related UF and EM objectives should be identified.

Community working group/tree board:

- What will our risk management program accomplish
- Goals & strategies (get specific)

Guiding principles:

- Increase public safety
- Promote tree health & sustainability

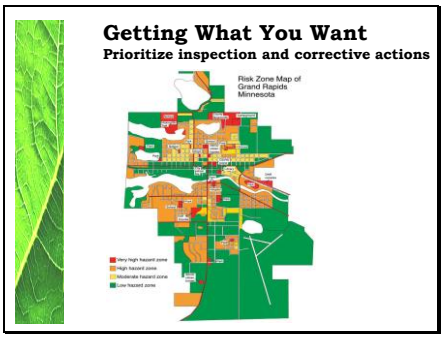
Prevent hazardous defects:

- Sound arboricultural practices
  - site
  - species
  - planting
  - young tree care
  - mature care
- Corrective actions
  - young tree care
  - address target issues
  - prune & remove

Tree risk zones:

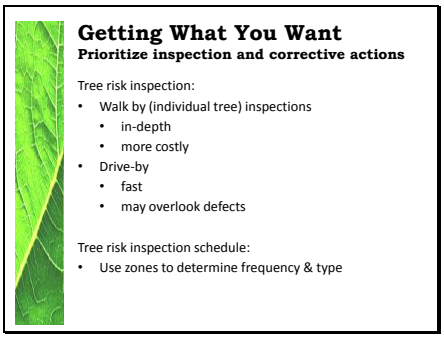
- Trees
- Roads & streets
- Occupancy
  - people
  - places or sites (buildings)

Slide 13



The risk zone map.

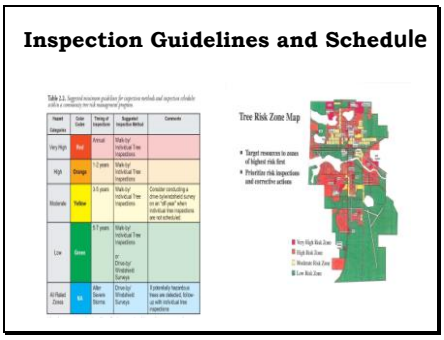
Slide 14



Match the frequency & intensity of inspection with the zone.

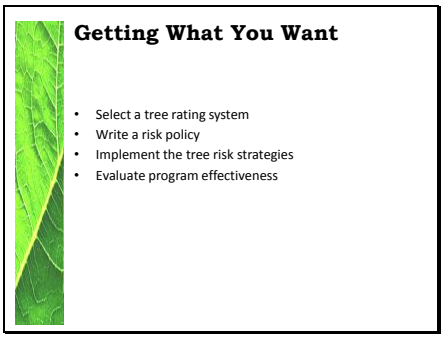
Same zones assist UF manager and local EM in disaster preparedness.

Slide 15



Set inspection schedule based on risk zone classification (where have we heard this before!).

Slide 16



Standardizing your risk inspections based on current arboricultural standards:

- Matheny & Clark (1994)
- ANSI A300 (Part 9)-2011 - Tree Risk Assessment

The "No target, No risk" concept applies for disaster planning also.

Importance of standardized method:

- Repeatable
- Reliable
- Easier to maintain trained staff
- Standardize record keeping & data
  - convenience
  - accuracy

Photographic Guide (12 point)

- Target (0-4) – No target, No risk
- Size of part (1-4)
- Probability of failure (1-4)

Critical element!
The act of writing your risk policy is an important step that can refine your objectives, goals, and strategies. It makes it available to other municipal managers and staff, elected officials, and residents.
The tree risk specification that adheres to ANSI A300 (Part 9)-2011 can be the basis for this more detailed policy

:e, adopt, and enforce this policy:

- Must support all other policy & documents
- Community responsibility
- Administration (who is responsible)
- Rating system specified
- Inspection methods and schedules
- Process for corrective actions
- Action appeals
- How to handle violations of the policy

Proper implementation requires resources and demands documentation (see ANSI A300 (Part 9)-2011 Tree Risk Assessment).
Your local EM may have access to state mitigation funds for some of this work identified.

Resources:

- Staff
- Training
- Documentation

Implementation documentation:

- Inspections
- Actions
- Failures

Common outcomes from a well designed and implemented tree risk management plan. These are disaster-related outcomes also.

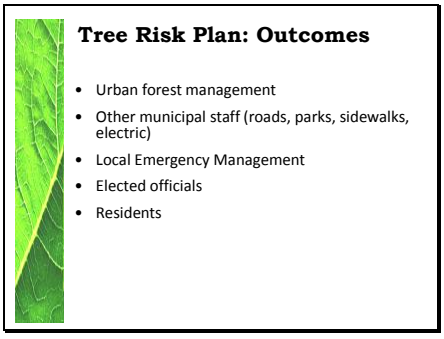
Outcome based measurements & evaluation:

- Increased public safety
- Improved tree health

Indicators (for measurement):

- Decline in number of high-risk trees
- Reduction in number of trees needing hazard pruning
- Reduction in storm damage (debris)

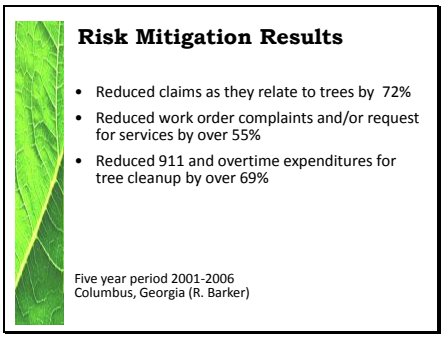
Slide 17



Implementation of an urban tree risk management program can benefit more than the urban forest manager.

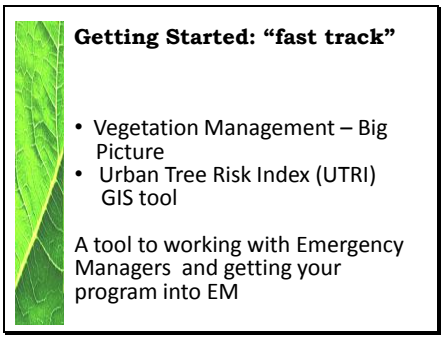
The EM link.

Slide 18



Measured results from an aggressive tree risk management program in Columbus, Georgia (from Rachel Barker).

Slide 19

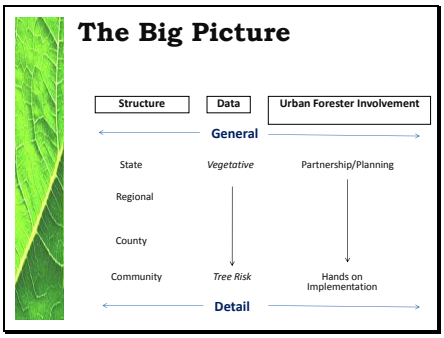


A fast track approach to getting UF into the EM arena.

Developed in partnership by CARPDC with Urban Forestry South, Alabama Emergency Management Agency (AEMA), Society of Municipal Arborists (SMA) and Alabama Association of Regional Commissions (AARC).

Funded by National Urban and Community Forestry Advisor Council (NUCFAC).

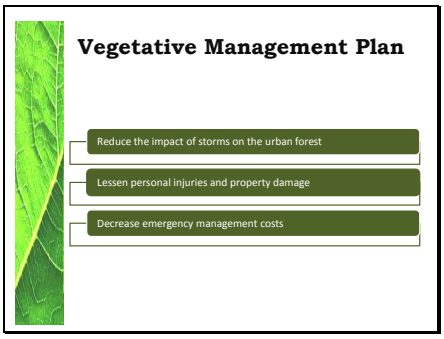
Slide 20



As we began to develop the template for the Vegetative Management Plan and the GIS model (UTRI – Urban Tree Risk Index) we utilized the concept of the general overall look at a region… A look at the overall Vegetation vs. the more detailed as utilized in a community Tree risk management plan.

An urban forester is likely to be involved on the state level and regional in a partnership and utilized more likely in the planning phases of how to manage and developing the plan where as the Community level is more likely to be utilized with hands on implementation and overseeing the plan.

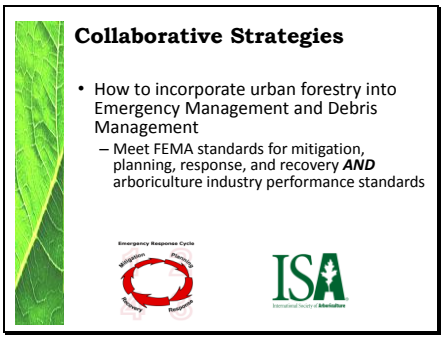
Slide 21



Template goals of the Vegetative Management Plan template.

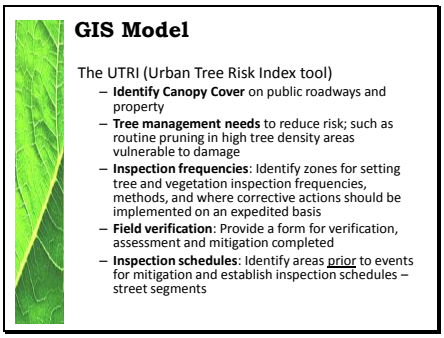
They are very simple – Speaks the EM language – and helps you get to the table

Slide 22



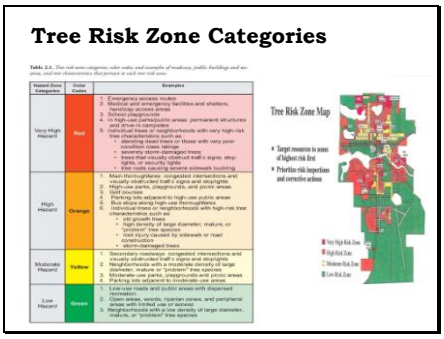
And within those goals how to incorporate collaborative strategies to integrate EM and UF throughout the plan.

Slide 23



Steps to UTRI implementation.

Slide 24

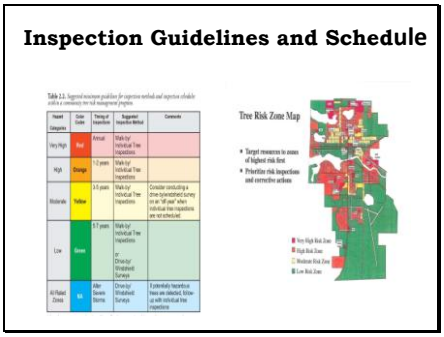


UTRI and the resulting Vegetation Risk Management Plan are based on the Pokorny approach as developed in the Urban Tree Risk Management Guide.

The tree risk guide defines zones at four levels, high to low, based on transportation routes, use areas (parks), neighborhoods, and tree characteristics.

This concept of risk zones provides a management framework that is used to prioritize and schedule risk reduction inspections and maintenance.

Slide 25



Set inspection schedule based on risk zone classification (where have we heard this before!).

Slide 26

In this portion of the presentation, I will discuss how we used a landscape scale assessment of tree risk to develop information useful to local emergency managers – Vegetation Management.

As discussed earlier, we are specifically developing a regional (planning) approach to emergency management support that includes input from professional urban foresters.

In working with EM, we focus on the primary AOI for emergency planning.
These include:

- planning/mitigation
- potential debris (not volume but an index)
- information that will support response (debris removal)
- recovery

Slide 27

Tree Risk Zones
Regional Approach for EM

- Roadway characteristics
  - Important travel corridors
  - Population
- Public use & occupancy patterns
  - Public facilities
  - Population
- Tree resource characteristics
  - Tree canopy as surrogate for large scale

For this county level analysis we assembled "risk zone" data that would provide information useful for EM planning; that is, those areas of most concern for **mitigation (removals, pruning) pre-storm and for recovery efforts that might include planting.**

Slide 28

UTRI Model

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

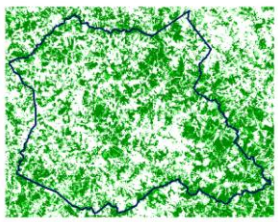
GIS models work with layers, and we assembled readily available data from local, regional, state & national sources.

For any area, you use data available; as the scale becomes more "local" the data should become more detailed and have a finer resolution; and also should be more current:

- canopy
- block tree counts
- individual trees

Slide 29

GIS Layer: Tree Canopy



Grid cells are percentage of canopy in the pixel (i.e. value from 0 to 100).
Reclassified to a scale of 0 – 12.

or some other system like: four different levels:

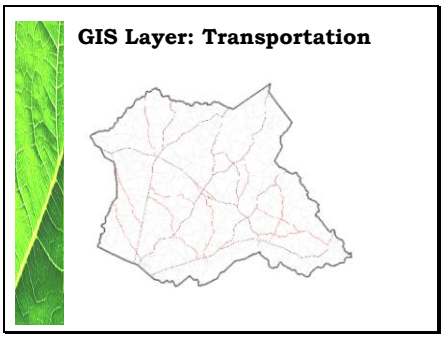
- change 76 and greater to 4
- 51 - 75 to 3
- 26 - 50 to 2
- 1 - 25 to 1
- 0 stays 0

Example:

Madison County, Georgia
NLCD 30 meter

NAIP 1 meter would also be useful
Or other local canopy studies

Slide 30



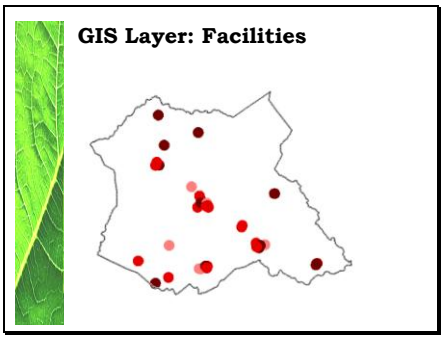
The transportation layer is grouped by road class and then classified on a scale of 0 – 4.

Road Classes: A1 = 4, A2 = 3, A3 = 2, and the remaining equals 1.

Data Sources:

- State DOT
- Census Tiger
- Local community

Slide 31



A simplified approach to factor facilities into the UTRI.

Facilities (fire, police, city hall, etc.) classified into a scale of 0 – 4:

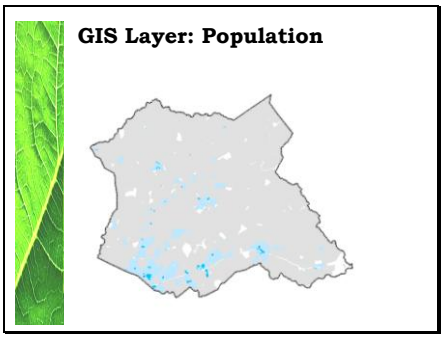
- Fire, Police, Hospitals, Emergency Management Center=4
- Communication Towers, Water Treatment Plants, Water Towers, Waste Water Treatment Plants=3
- Schools, Parks, and other locations where people congregate=2

A simple ¼ mile buffer is placed around these facilities; a more sophisticated (road) network approach needs to be implemented.

Date Sources:

- EM
- HSIP Data CD

Slide 32



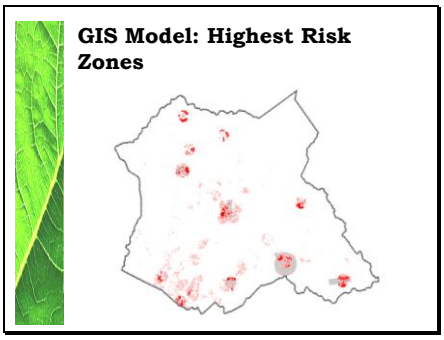
Census data; reclassified to a 0 – 4 scale.

From 0 through 4 based on the population density field (population/square mile).

Data Sources:

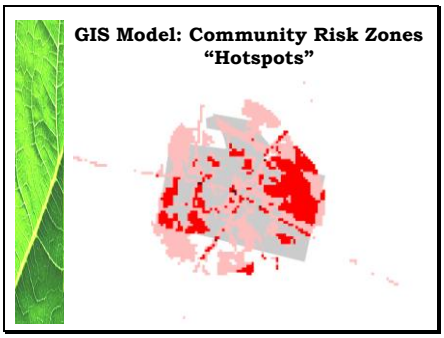
- Census
- HSIP Data CD (Homeland Security Infrastructure Project)

Slide 33



The summation of all layers and "normalization" onto a scale of 0 – 12 (or 0-10 if you like).

Slide 34



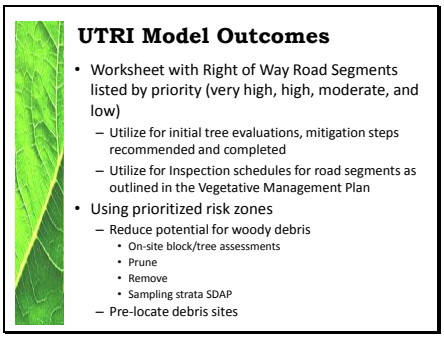
Close up into a populated area (Ila, Georgia). Transportation corridors are visible where there are trees. Places included city hall, fire station and water tower.

The field evaluation step:

- overlay street network and verify street segments for risk assigned
- modify the risk zone map based on field checks.

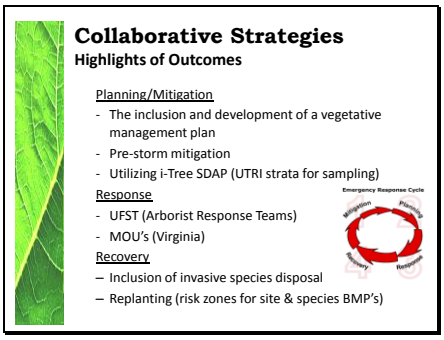
In highest risk areas, make initial tree evaluations; take necessary mitigation steps.

Slide 35



From the UTRI Model and Vegetation Risk Management Plan.

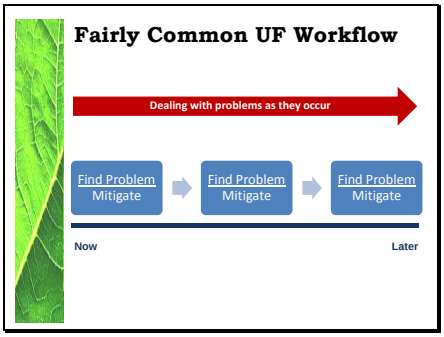
Slide 36



Some highlights of collaborative strategy outcomes.

The Vegetative Management Plan can be updated after an event… or every 5 years with the County's Pre-Hazard Mitigation Plan utilizing the UTRI model.

Slide 37

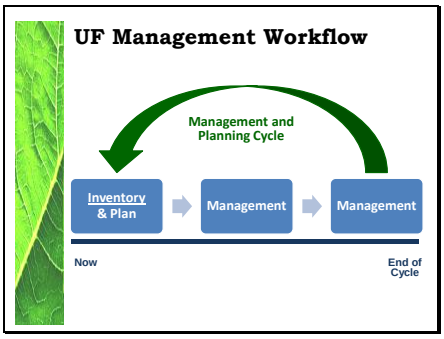


A common approach to urban forest management (workflow or timeline):

- deal with problems as they arise (i.e. "putting out fires")

May be appropriate for very small management areas or ownerships, or as the tree resource changes over time (i.e. there are ways to rationalize this approach!).

Slide 38



A recommended urban forest management workflow (or timeline):

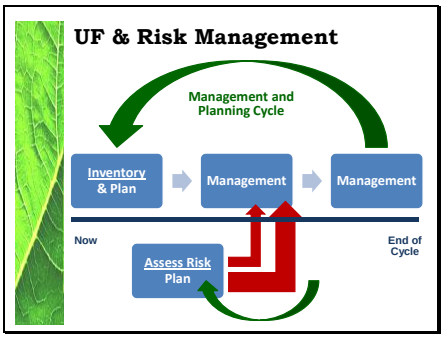
Inventory the resource of interest (i.e. entire city, a park)
Develop a management plan

- with short-term action plan for a specific time period (i.e. cycle)
- plan will have long-term goals, objectives, and strategies

Manage your urban tree resource over the management/planning cycle

- tree planting
- mulching
- young tree pruning
- pruning mid-aged to mature trees
- removals (for a variety of reasons; problems (i.e. risk), construction, redesign)
- special areas or purposes (riparian areas, parks, watershed protection, carbon, pedestrian amenities)

Slide 39



An urban forest management workflow (or timeline) that adds Urban Tree Risk Management:

Inventory the resource of interest (i.e. entire city, a park)
Develop a management plan

- with short-term action plan for a specific time period (i.e. cycle)
- plan will have long-term goals, objectives, and strategies

Manage your urban tree resource over the management/planning cycle

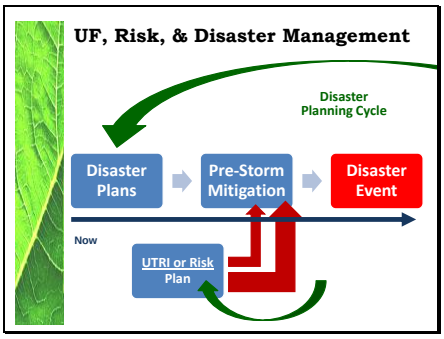
- tree planting
- mulching
- young tree pruning
- pruning mid-aged to mature trees
- removals (for a variety of reasons; problems (i.e. risk), construction, redesign)
- risk mitigation
- special areas or purposes (riparian areas, parks, watershed protection, carbon, pedestrian amenities)

Inventory and develop a separate risk management plan

- this feeds into your management cycle

the risk management cycle may be shorter than your urban forest management cycle

Slide 40



An urban forest management workflow (or timeline) that uses UTRI or Urban Tree Risk Management to support local disaster planning:

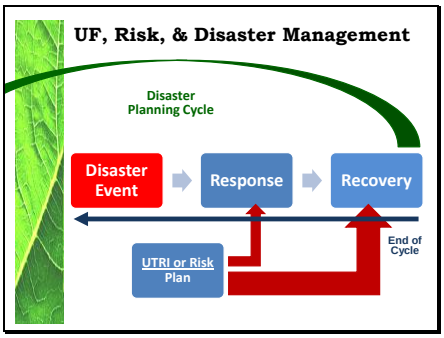
Disaster planning at the local level (county)
- disaster plan
- vegetation plan
- debris plan

Risk management
- UTRI (the "fast track" to local disaster planning for vegetation)
- Urban Tree Risk Management (Pokorny)

Pre-storm mitigation based on priority areas established by urban tree risk management
- work on mitigation until disaster strikes!
- reassess tree risk or UTRI over a short horizon (3-5 years)

Disaster Plans may include:
- County Disaster Plan (general, umbrella plan)
- Pre-Hazard Mitigation Plan
- UTRI fits in here
- State pre-hazard mitigation grants
- Vegetation Plan
- Debris Management Plan
  - UTRI fits in here (planning for debris staging areas)

Slide 41



An urban forest management workflow (or timeline) that uses UTRI or Urban Tree Risk Management to support local disaster planning:

During disaster response
- UTRI information is used for debris management (i.e. pile location, estimates of volume)
- could assist with UFST deployment (particularly reconnaissance)

During recovery
- UTRI indexed road segments help determine & guide replanting

Post-recovery
- disaster planning cycle repeats
  - UTRI or Urban Tree Risk Management is updated

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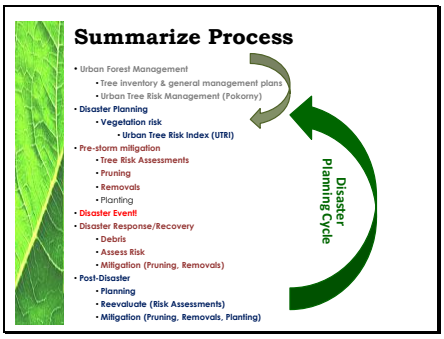

The last two graphics presented in a different format…

The disaster process outlined with urban forest management (including risk) involved.

UF management can feed the disaster planning cycle, or if lacking, the UTRI ("fast track") can be used.

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A PDF of this presentation will be downloadable from www.UrbanForestrySouth.org.

Quick Search for 'UTRI' or 'Tree Risk' or 'Disaster' (no quotes).