



City of Tampa Urban and Community Forestry Grant: Toward the Development of a Strategy for Urban Forest Sustainability

FINAL REPORT: 3/31/2009

Introduction

The primary goal of this project was to develop initial Strategies for Urban Forest Sustainability and prepare many of the elements necessary to eventually create a comprehensive Urban Forestry Master Plan. We accomplished this goal through a stakeholder driven, publicly supported process that built upon the results of existing scientific efforts. This brief final report summarizes the process, products and results of the efforts supported by the Urban and Community Forestry Grant (U&CF).

Process and Products

Work efforts supported by the U&CF grant are outlined below in chronological order. Based on revised ideas to better achieve project goals, and with agreement with City staff, the specific order of tasks and exact specification of work efforts differs slightly from the original project plan. The following is an outline and brief description of specific efforts.

Baseline urban forest data (funded by City as a match for U&CF grant)

The impetus for this project was the City of Tampa Urban Ecological Analysis 2006-2007. This project was funded directly by the City and serves as a match for the U&CF grant. Final products of this analysis included high-resolution tree and vegetation cover maps, analysis of tree canopy change from 1976 to 2006, results of UFORE analysis such as composition, structure, health, invasive and exotic species occurrence, environmental and economic benefits, and other relevant analysis.

Products resulting from this task:

1. City of Tampa Urban Ecological Analysis 2006-2007 ([TampaUEA2006-7 FinalReport.pdf](#))
2. Presentation of results to Tampa City Council on 4/24/2008 ([TampaUEA CityCouncil.pdf](#))

Public Workshop.

Results of the Urban Ecological Analysis and educational programming related to the benefits of trees and urban forestry were presented at a half-day public workshop called the *Mayor's*

Symposium on Community Trees and the Urban Forest. Over 128 people attended the symposium, representing concerned citizens, planners, neighborhood associations, developers, business leaders and government agencies. In addition, the Sun Coast Section of the American Planning Association Florida Chapter provided 1.5 AICP Certification Maintenance credits for planners who attended the event. Facilitated working groups were included to gather public concerns and issues associated with Sustaining Tampa's Urban Forest.

Products resulting from this task:

1. Flyer advertising the symposium and agenda ([TampaMayorSymposium.pdf](#))
2. Fact sheets distributed to symposium participants ([TampaUrbanForest_AllFactSheets.pdf](#))
3. PowerPoint presentation used during symposium ([TampaUEA2006_Symposium.pdf](#))
4. Symposium results: Open Forum Responses ([Symposium_OpenForumResults.pdf](#))

Mayor's Steering Committee on Urban Forest Sustainability

The efforts of the steering committee represented a major part of the U&CF project. The committee was formed with representatives of a diversity of stakeholder groups, including: the Mayor's Beautification Program; Tampa Bay Builders Association; Arborists; Tampa Reforestation and Environmental Efforts; Tampa Electric Company; Urban Foresters; and the neighborhood and community associations within the City of Tampa. Meetings were organized and directed by a team from the University of Florida, University of South Florida and Hillsborough County Extension. Through a process of open discussion and facilitated decision making the steering committee identified a vision statement, goals and implementable strategies to guide urban forestry policy and management efforts within the City of Tampa. The work effort included four meetings:

- September 16, 2008: Development of a Vision for Tampa's Urban Forest
- October 21, 2008: Goals Development
- November 18, 2008: Strategy Development
- January 20, 2009: Completion of work efforts and presentation of next steps

Products resulting from this task:

1. Letter to conformed committee members ([SteeringCommittee_ParticipantLetter.pdf](#))
2. Presentation at first meeting ([TampaUEA2006_Committee_9-16-08.pdf](#))
3. Steering Committee Meeting Agendas ([SteeringCommittee_Agendas.pdf](#))
4. Minutes from Meeting 1 ([CommitteeMeeting1_minutes.pdf](#))
5. Minutes from Meeting 2 ([CommitteeMeeting2_minutes.pdf](#))
6. Minutes from Meeting 3 ([CommitteeMeeting3_minutes.pdf](#))
7. Presentation at final meeting ([TampaUEA2006_Committee_1-20-09.pdf](#))
8. Committee's Final Vision, Goals and Strategies ([TampaUF_Vision-Goals-Strategies.pdf](#))

Forest Opportunity Spectrum Analysis

The Forest Opportunity Spectrum (FOS) was a method to identify existing and possible urban tree canopy locations. The project was modeled after the Forest Opportunity Spectrum analysis

developed by the USDA Forest Service's Northern Research Station and the Spatial Analysis Laboratory (SAL) of the University of Vermont and used with cities such as Baltimore, Maryland and New York City. The goal of the project was to leverage the high resolution geospatial datasets developed during the Urban Ecological Analysis to compute UTC metrics at the parcel level and summarize this information both by land use and by spatial distribution. Detailed information on Tampa's existing and possible UTC should be used to inform strategic planning for urban forest planting, management and educational goal setting efforts in the City. In addition to the FOS analysis, project partners have arranged for a related training session for Florida Urban Foresters and Planners. The training session will be an online presentation by Dr. Morgan Grove from the USDA Forest Service's Northern Research Station to educate attendees about the Forest Opportunity Spectrum approach and the lessons learned from major northeastern cities where the methods have been employed.

Product resulting from this task:

1. A Report on the City of Tampa's Existing and Possible Urban Tree Canopy ([Tampa FOS Document.pdf](#))
2. Training/Educational presentation by Dr. Morgan Grove from the USDA (scheduled)

Community Preferences Survey (funded outside U&CF grant)

The University of Florida, Hillsborough County Extension, and University of South Florida are currently surveying City of Tampa neighborhood association members and residents to identify the perceptions of community members regarding urban forests. Although not supported by the U&CF grant, the survey results will be analyzed within the context of the Urban Ecological Analysis, Symposium, Steering Committee, and Forest Opportunity Spectrum to inform the future development of an Urban Forest Management Plan.

Results and Next Steps

The specific products mentioned above will be used by stakeholders the City of Tampa as part of general and specific urban forest related planning efforts. In addition to the broader implications of the U&CF supported work efforts, there are several specific outcomes worthy of note. The following represent direct and indirect results of the increased focus on urban forestry brought to Tampa in association with the U&CF grant project.

- City of Tampa Strategic Plan. Each year the City of Tampa develops a strategic plan for the operations of government. This year, the City incorporated specific points within the strategic plan based on the knowledge gained as part of the urban forest efforts. For example, in choosing where to plant trees the plan indicates City staff will "Evaluate site locations for appropriateness according to Best Management Practices and the Urban Forest Steering Committee Goals and Strategies." See [StrategicPlanElements.pdf](#).
- Comprehensive Plan Elements. In 2008, the City of Tampa updated its Comprehensive Plan (currently undergoing review by State of Florida Department of Community Affairs).

Specific elements were included in the updated comprehensive plan focused on Urban Forestry. Specifically, a new Urban Forestry section was added to the plan to include policies specific to the goals of urban forestry. For example, “Objective 38.27. The City of Tampa will maximize the retention and enhancement of the City’s mature native shade tree canopy for the environmental value and for the contribution to this City’s quality of life.” The inclusion of an urban forestry section means that future development plans within the City, such as the new form-based zoning approach, will include urban trees as an important consideration. See [TampaCompPlan_UrbanForest.pdf](#)

- Restructuring of City of Tampa Parks and Recreation Department. The increased focus on urban forestry contributed to the successful restructuring of the City’s Urban Forest Management staff. The City hired a new Urban Forester to focus on operations management, and restructured an existing position to focus on planning and regulatory efforts related to urban forestry. Hiring an Urban Forestry was one of the strategies which emerged from the Committee on Urban Forest Sustainability. The U&CF project helped the City maintain support for these positions even given the serious economic climate recently facing Florida communities.

The U&CF grant helped the City achieve great progress, but there remains much work to do to ensure the sustainability of Tampa’s urban forest. The following represents the possible next steps related to urban forestry in Tampa which are currently under consideration and/or planning.

- Form-based Zoning. The updated Tampa Comprehensive Plan outlines form-based zoning as future approach to community development. As part of the guidelines for these efforts, landscaping, trees and the urban forest are identified as important components of a form-based design process. Products from the above listed tasks should be utilized during the development of form-based zoning for specific communities.
- Tree Ordinance. Chapter 13 of the City Land Development Code will eventually be revised. Tampa’s tree ordinance has at times been the subject of very divisive debate among the same stakeholders represented on the *Mayor’s Steering Committee on Urban Forest Sustainability*. The success of the effort to craft a vision, goals and strategies for urban forest sustainability demonstrates that these stakeholders actually share much in common related to urban forest management. This project provided a constructive format for discourse that can be used as a template for future discussions related to the tree ordinance. Perhaps more importantly, the project has built a level of trust between stakeholders which should help promote a collegial environment for future debates.
- Parks and Recreation Department Operations. Like all City Departments, Parks and Recreation has been faced with the challenge to provide services with a reduced budget. The outcomes of the various grant-related initiatives described above provide a certain

degree of guidance for the City to focus efforts where they are needed and desired. City staff will use these products to inform both planning efforts (e.g. form-based zoning) and operational management of specific programs. For example, Parks and Recreation staff can now begin to answer questions about where to focus tree planting and management efforts, which land uses offer the greatest potential for tree enhancement efforts, and what goals should be considered when targeting specific programs.

- **Urban Forest Management Plan.** The development of an approved Urban Forest 10-year Management Plan and annual operational plans is the next step being considered by the partners involved in the U&CF grant related efforts. The Management Plan would incorporate the results of the U&CF grant efforts together with the related Community Preferences Survey to developed land use specific urban forest management approaches (see conceptual process diagram shown below).

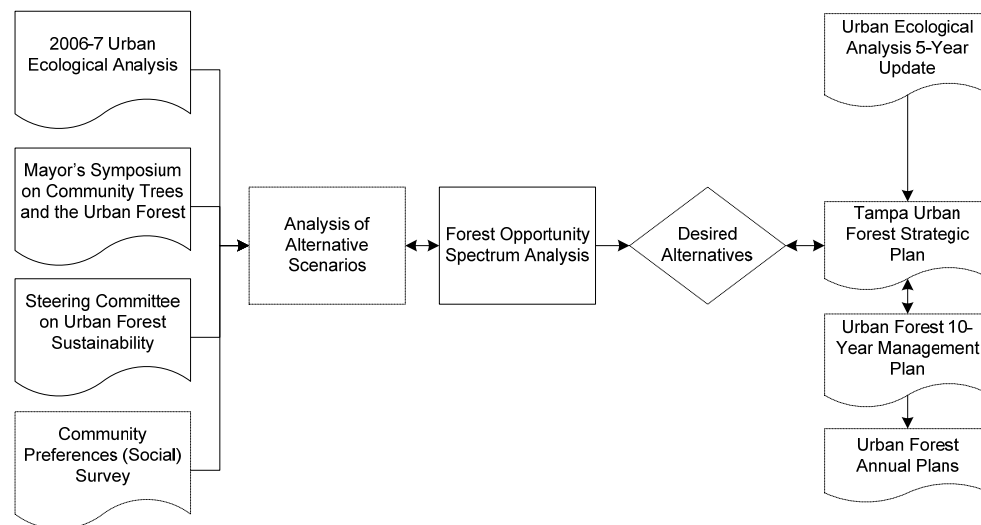
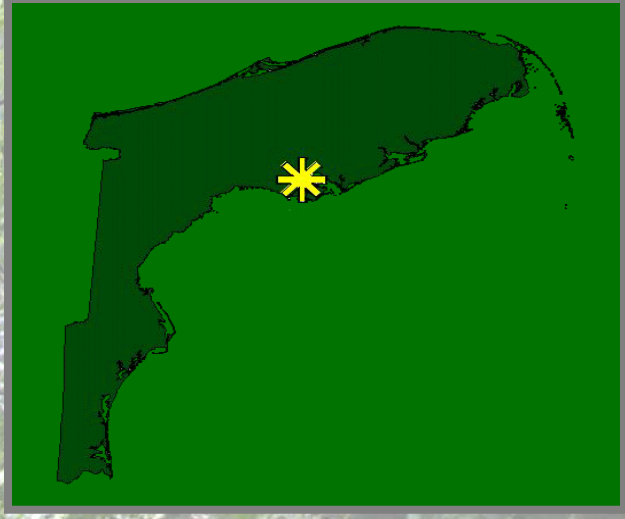


Figure 1. Conceptual process to create Urban Forest Management Plan.

For additional information please contact:

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City of Tampa Urban Ecological Analysis 2006-2007

University of South Florida

Shawn M. Landry, Dr. Ruiliang Pu and Cheran Williams

University of Florida

Dr. Michael G. Andreu and Melissa H. Friedman

University of Florida – Hillsborough County Extension

Robert J. Northrop



Project Objectives for the Ecological Analysis of the Urban Forest

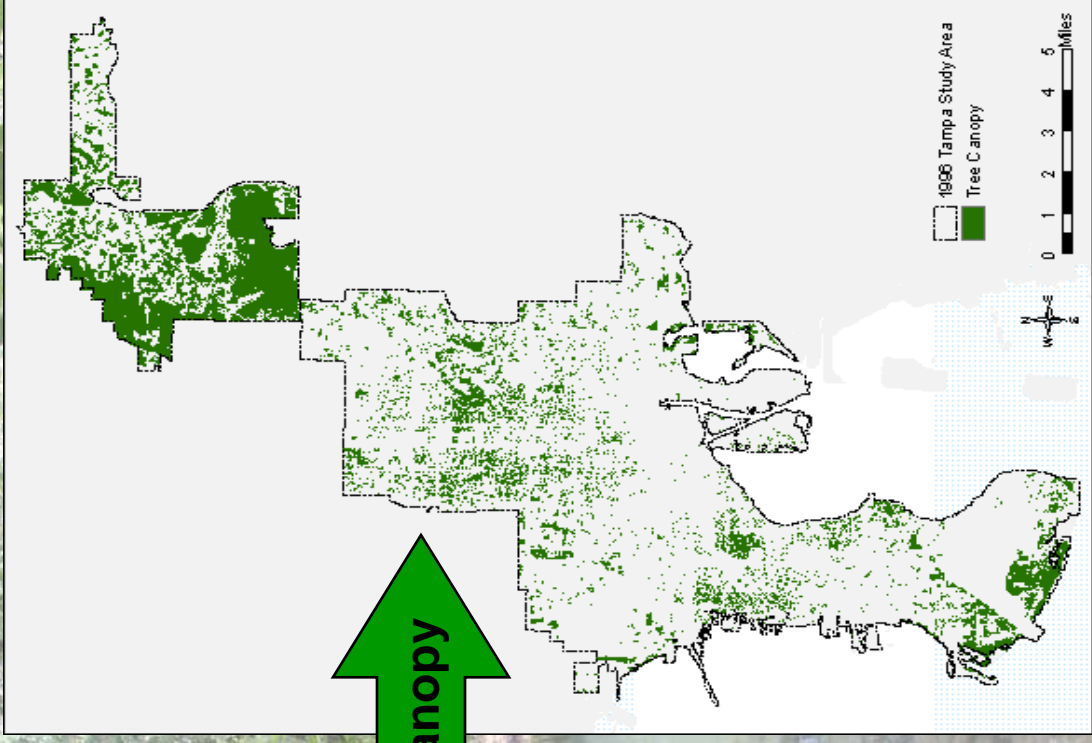
- Quantify the change in tree cover since 1996
- Use high-resolution techniques to determine the spatial variability in existing tree canopy cover
- Complete an updated & more thorough ecological analysis
- Assess the ecological health
- Estimate the ecological and economic benefits



Tree Cover Change Analysis Methods



Canopy / No Canopy



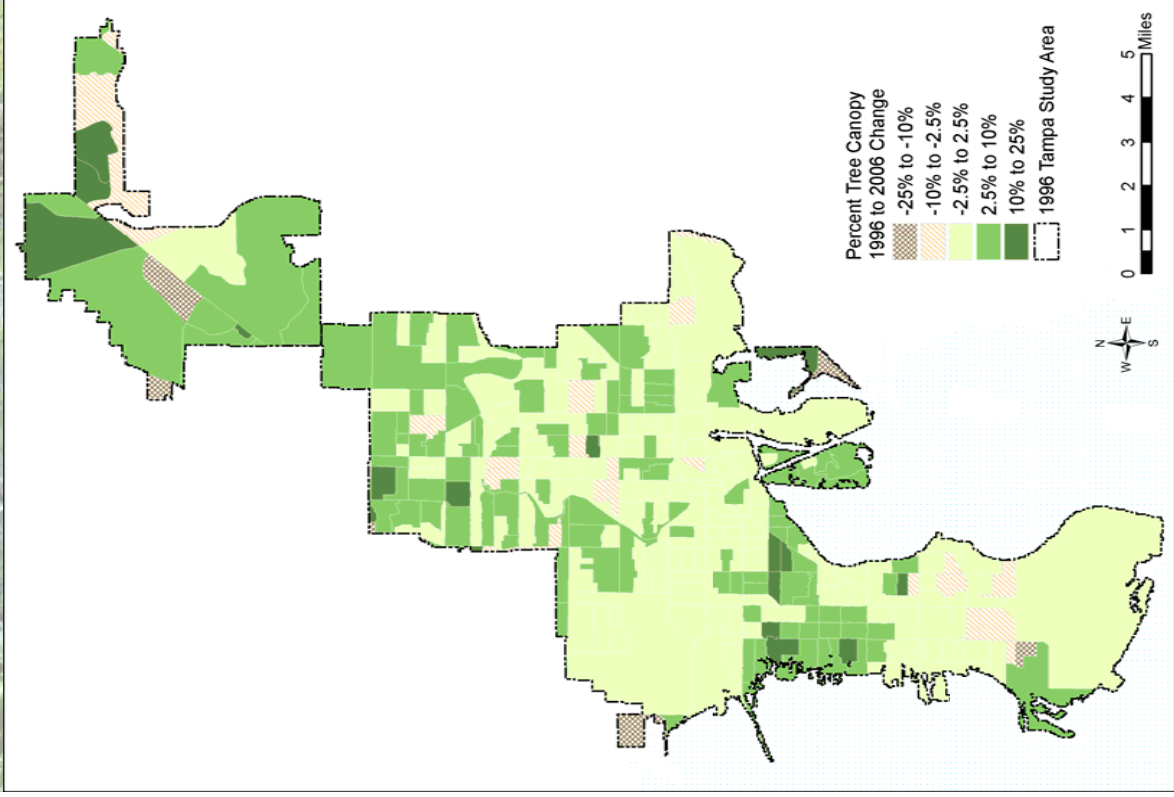
1975 - 2006 Tree Cover Change Analysis

Results

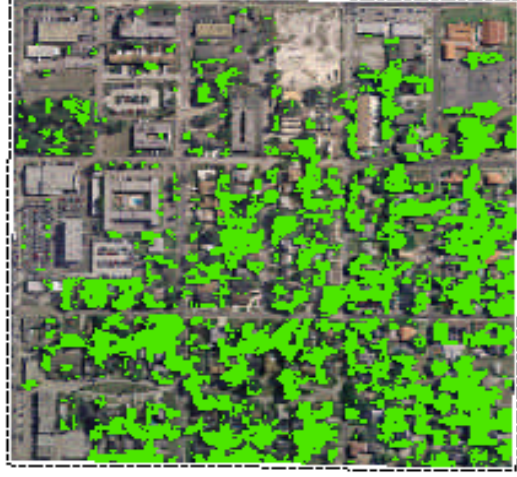
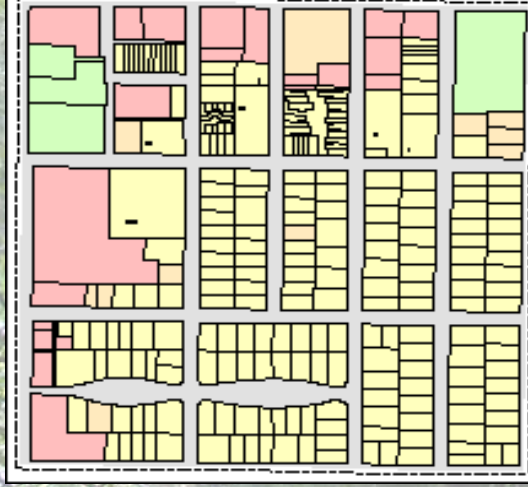
Change Detection Using Medium Resolution Imagery



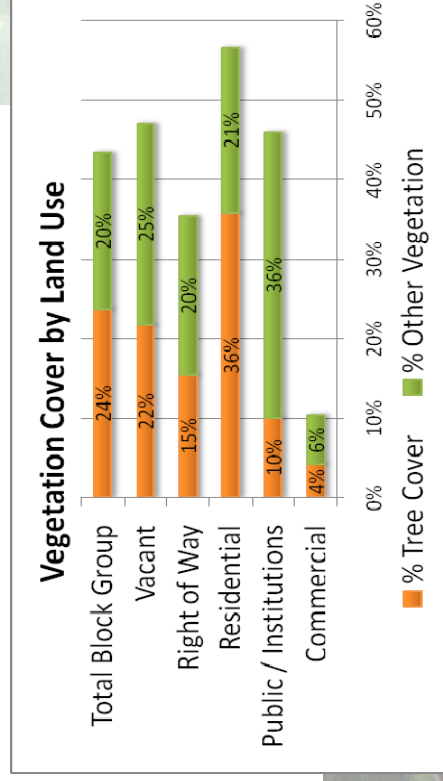
- Citywide increase in tree cover and return to 1970's citywide tree cover
- Some areas lost tree cover
- Reasons for change are not known



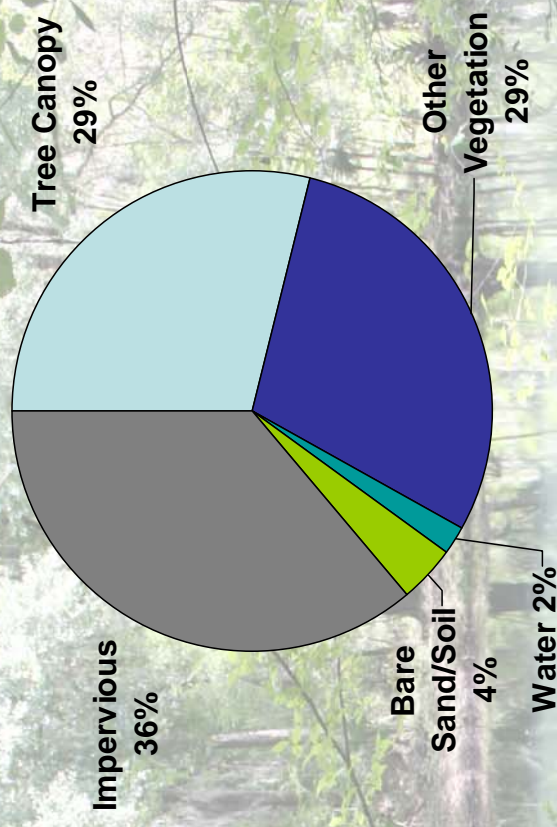
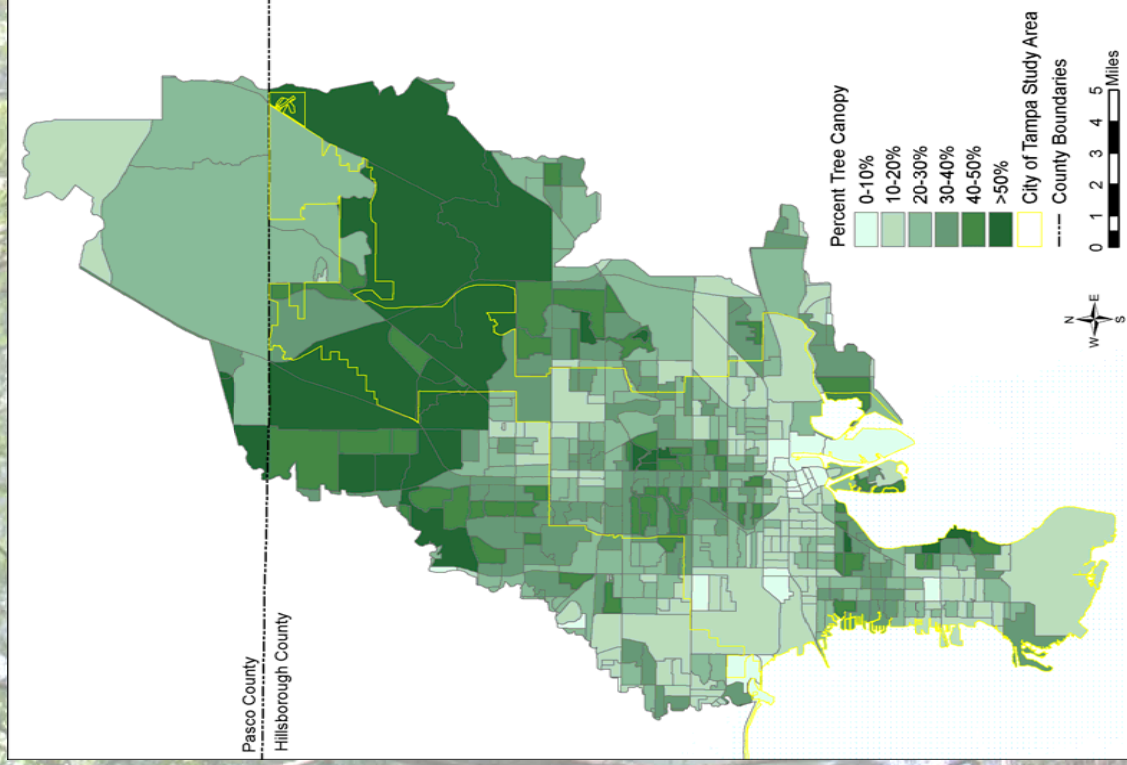
Establishing a New Benchmark 2006 Tree Cover



- Methods more robust than 1996 study
 - 900x greater spatial resolution (1m vs 30m)
 - More complete land cover classification
- 95.6% accuracy
- Individual trees detected
- This is part of a new benchmark for future studies



2006 Tree Cover (High-Resolution)



- 58% total vegetation cover
- Data can be used to answer specific questions
 - Where could street trees be planted?
 - Which neighborhoods might be targeted for additional planting efforts?

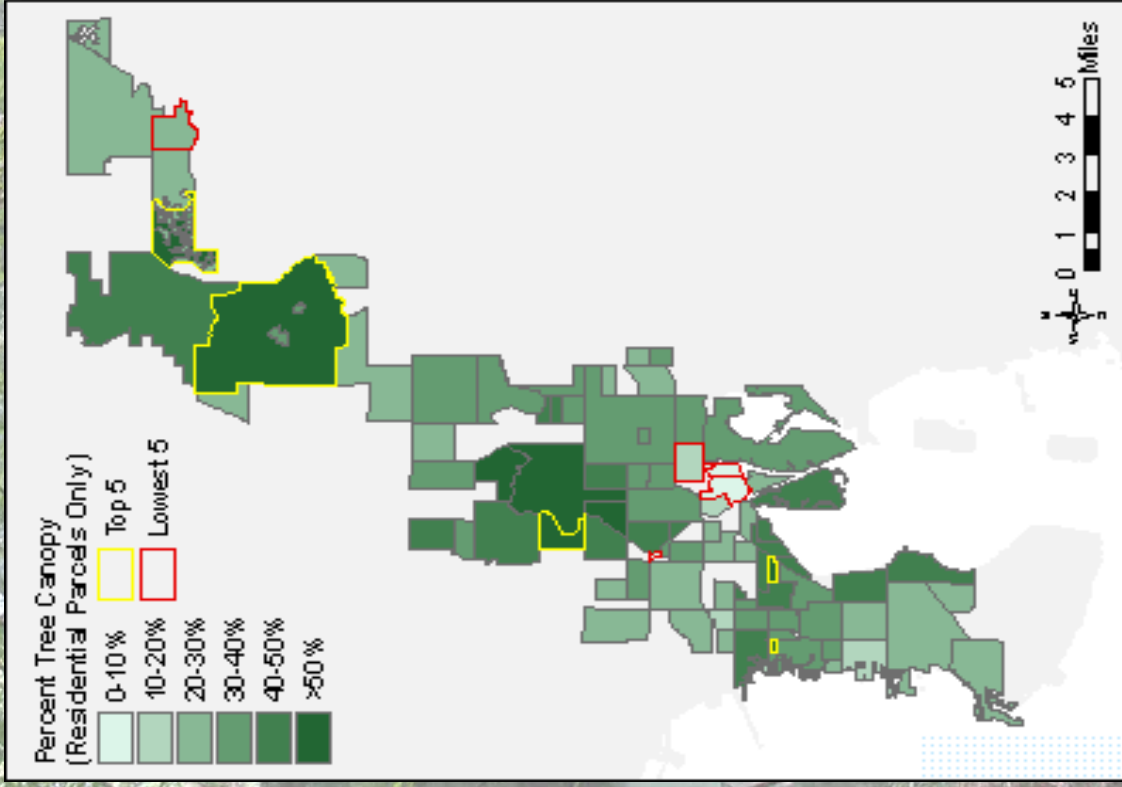
Tampa Tree Cover Compared to Surrounding Watersheds

- Lower tree cover for some land uses:
 - 10% lower overall tree cover (29% vs 39%)
 - 4% lower on urban/built-up land uses (23% vs 27%)
 - 13% lower on medium density residential* (30% vs 43%)
- Similar or higher tree cover for other land uses:
 - Similar tree cover on industrial lands
 - 7% higher on high density residential* (33% vs. 26%)
 - 2% higher on recreational lands

* Residential densities are generally 2-5 units/acre for medium and >5 units/acre for high.



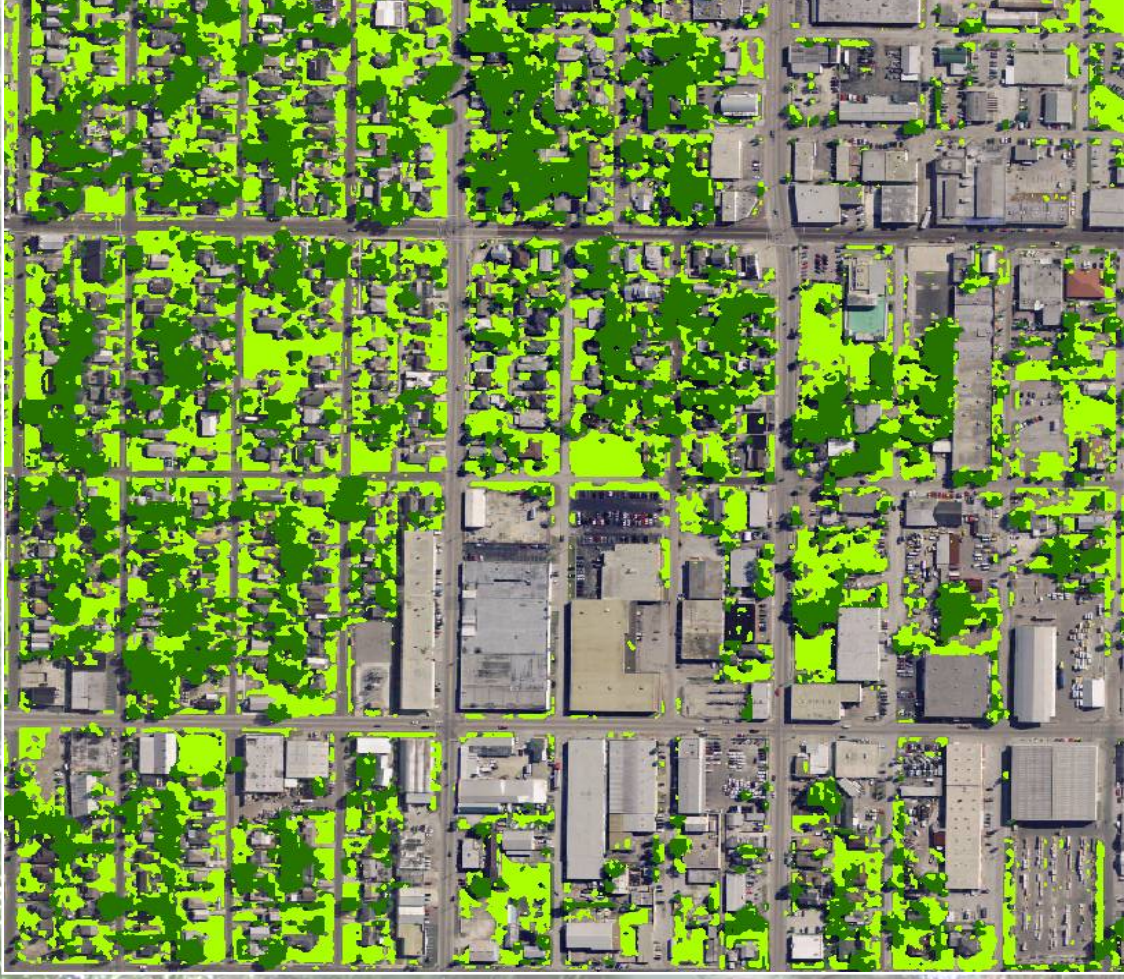
2006 Tree Cover by Neighborhood



- Neighborhoods with low tree cover did not necessarily have low total vegetation
- **Top 5 for Residential Tree Canopy (Yellow):**
 - Tampa Palms
 - Hunters Green Community
 - Culbreath Bayou
 - Riverbend
 - New Suburb Beautiful
- **Lowest 5 for Residential Tree Canopy (Red):**
 - Historic Ybor
 - Tampa Downtown Partnership
 - The Marina Club Of Tampa
 - Channel District
 - Cory Lake Isles
- Neighborhood tree cover is different when commercial and other land uses are included



Tree Canopy Cover is Only Part of the Story



- View from above can show the heterogeneity of land cover
- Tree cover is an indicator of the spatial distribution of other benefits
- Data can be used as part of a “green infrastructure” GIS layer
- But, an ecological analysis must also consider structure, composition and function...



First Steps



Dr. Dave Nowak
N.E. Research Station

This is the most scientifically robust system
available in the world today to describe the

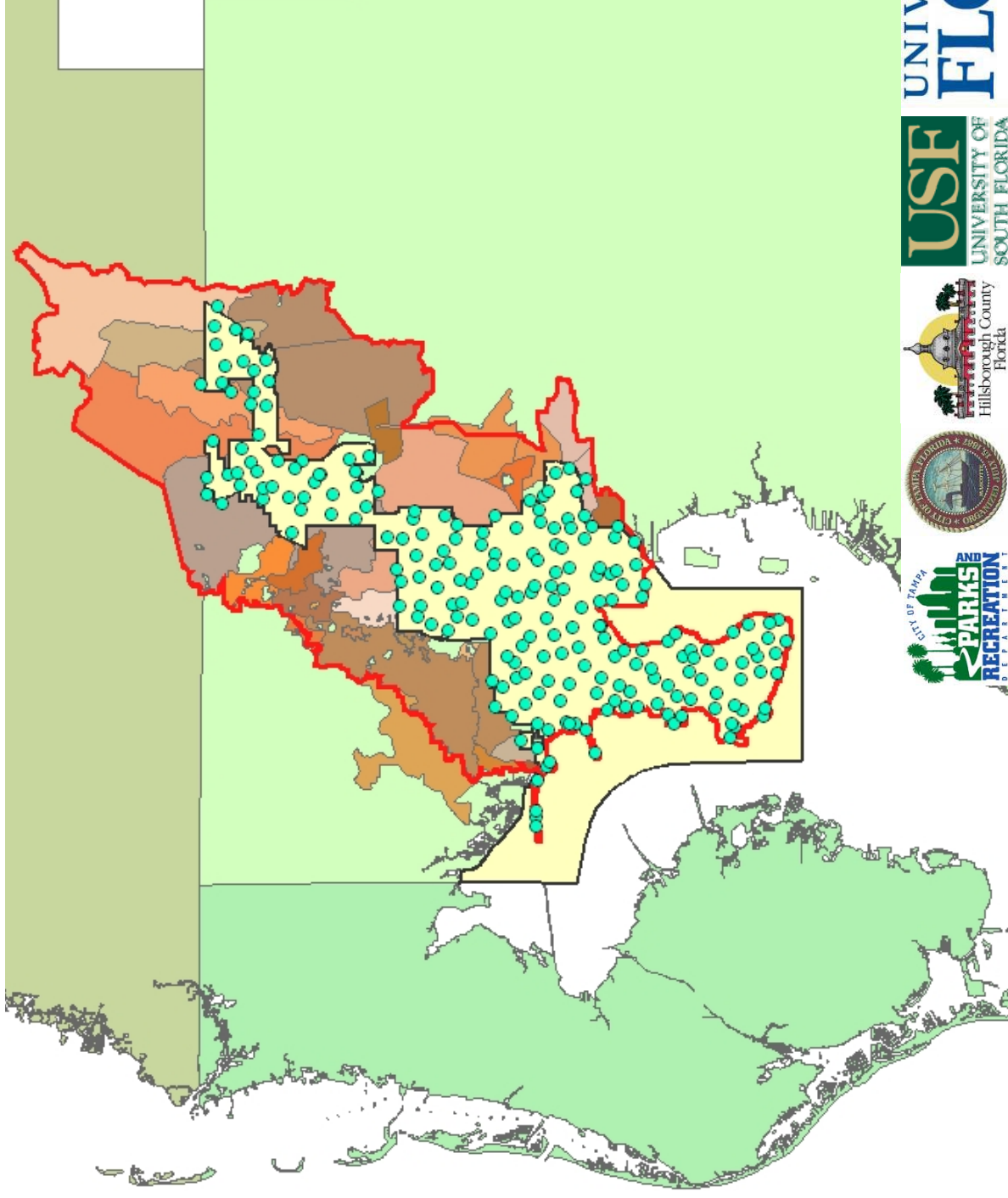
urban forest:
Structure, Composition & Function

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UNIVERSITY of
FLORIDA

200 plots has been shown in prior studies to optimize efficiency and minimize variation.





- Plots captured ground based information such as:

- Ground cover
- Shrub cover & composition
- Individual tree measures:
 - Diameter
 - Height
 - Crown Area
 - Crown Condition

- Information describes the forest at the level where we work and live.



Results - Canopy Cover

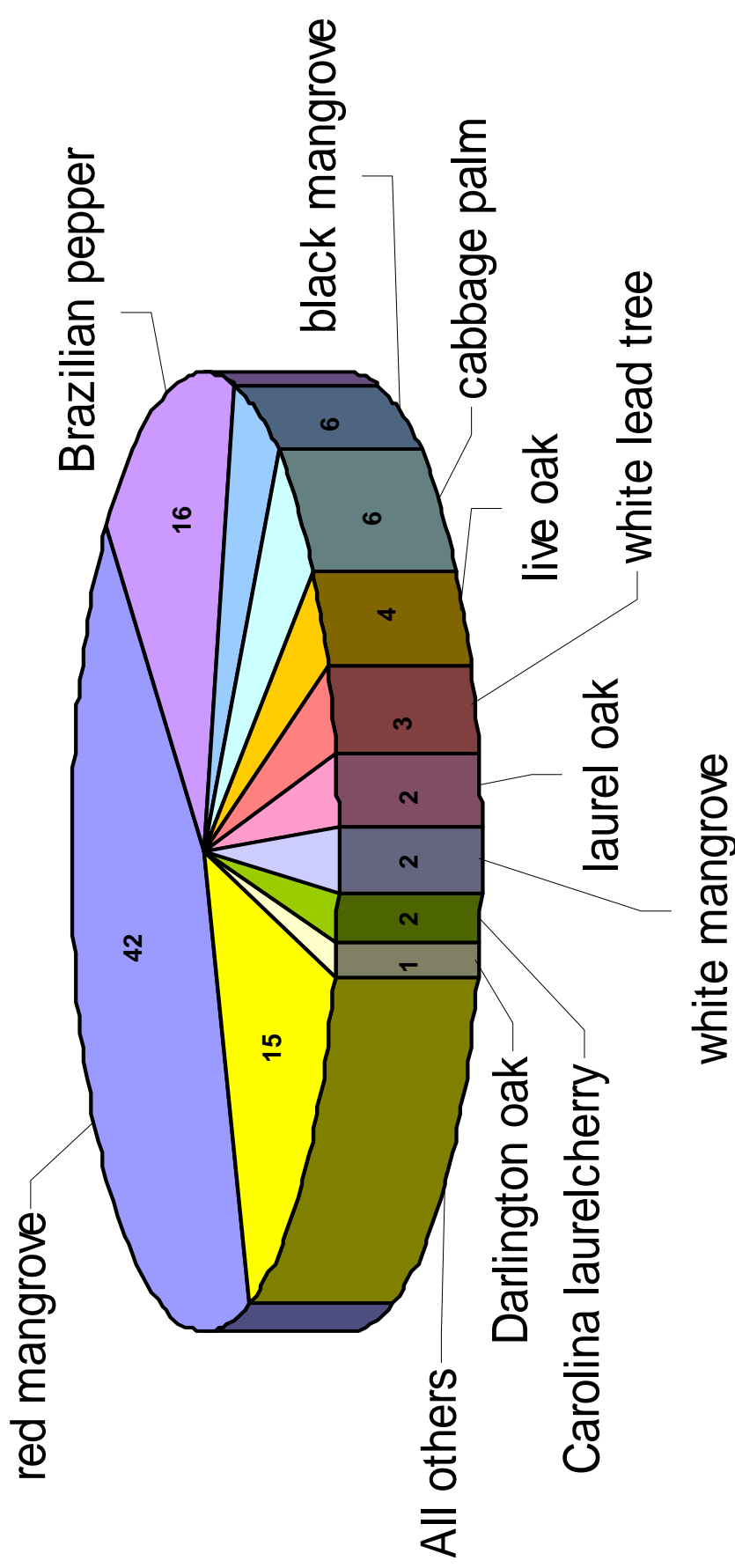
- Two independent methods for measuring the aerial extent of the urban forest....

- USF analysis = 29.0%
- UF - UFORE = 28.1%



Total Number of Trees: >7.8 million

Compensatory value: ~\$1.4 billion

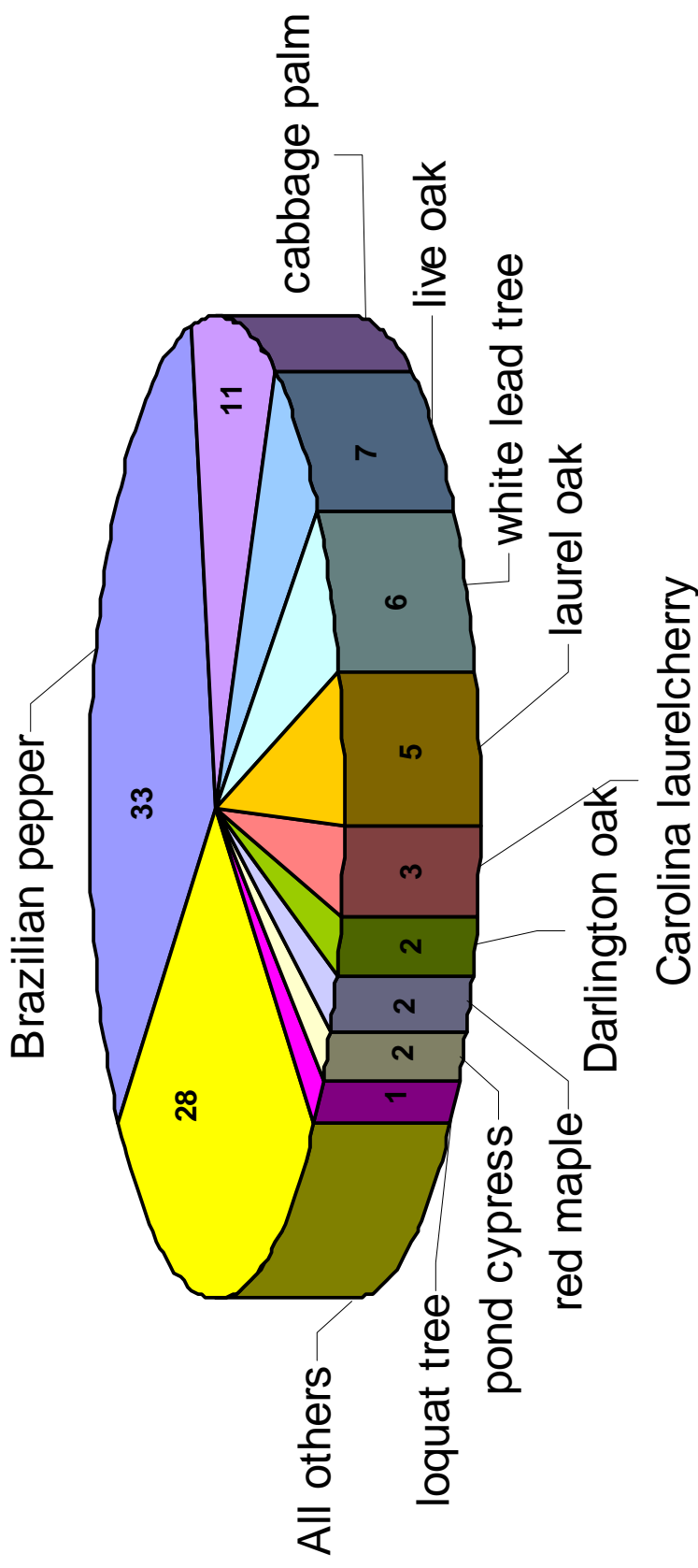


Tree = woody stem > 1 inch
diameter at breast height



Total Number of Trees: ~3.9 million

Compensatory value: ~\$1.2 billion



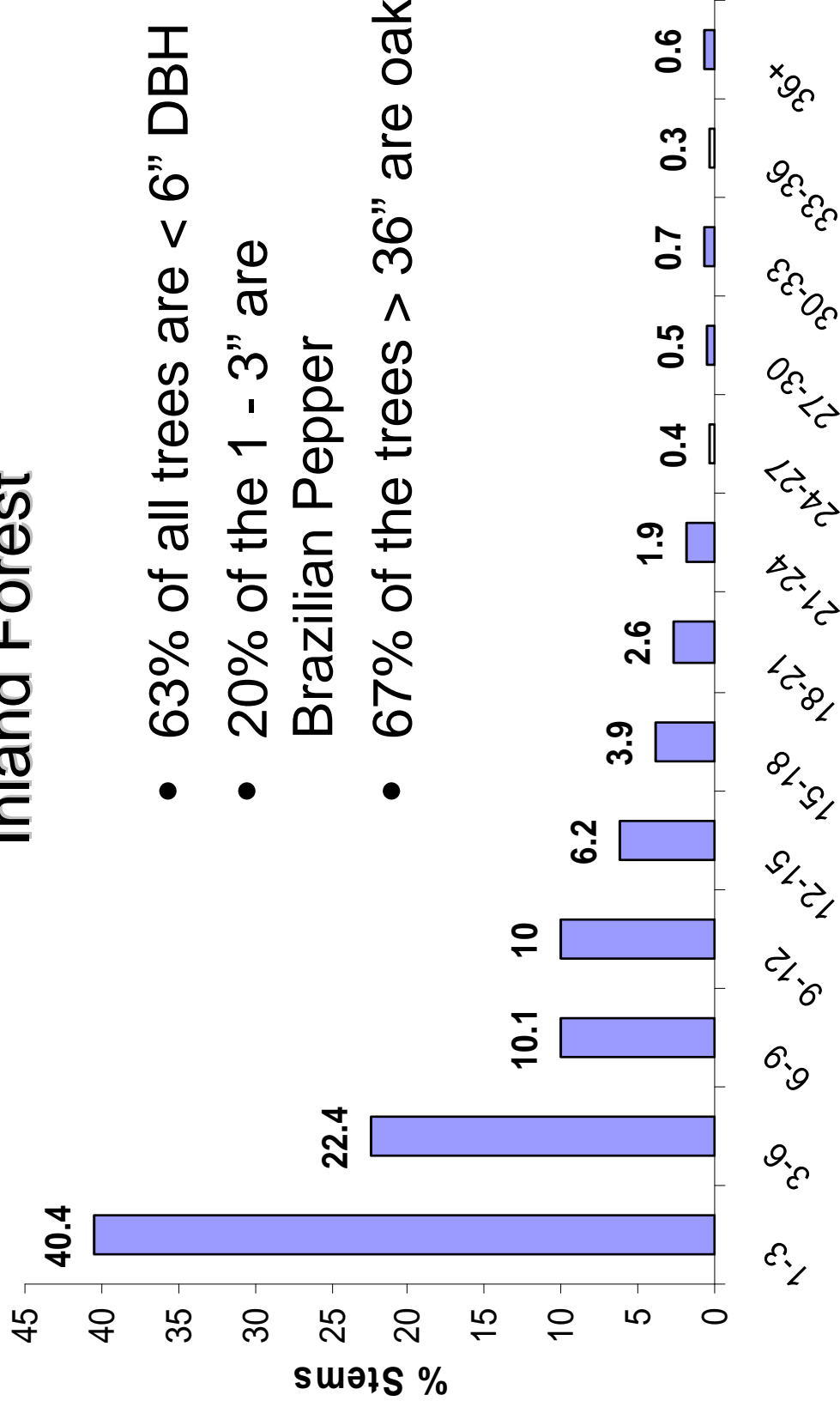
Tree = woody stem > 1 inch
diameter at breast height



Diameter Distribution

Inland Forest

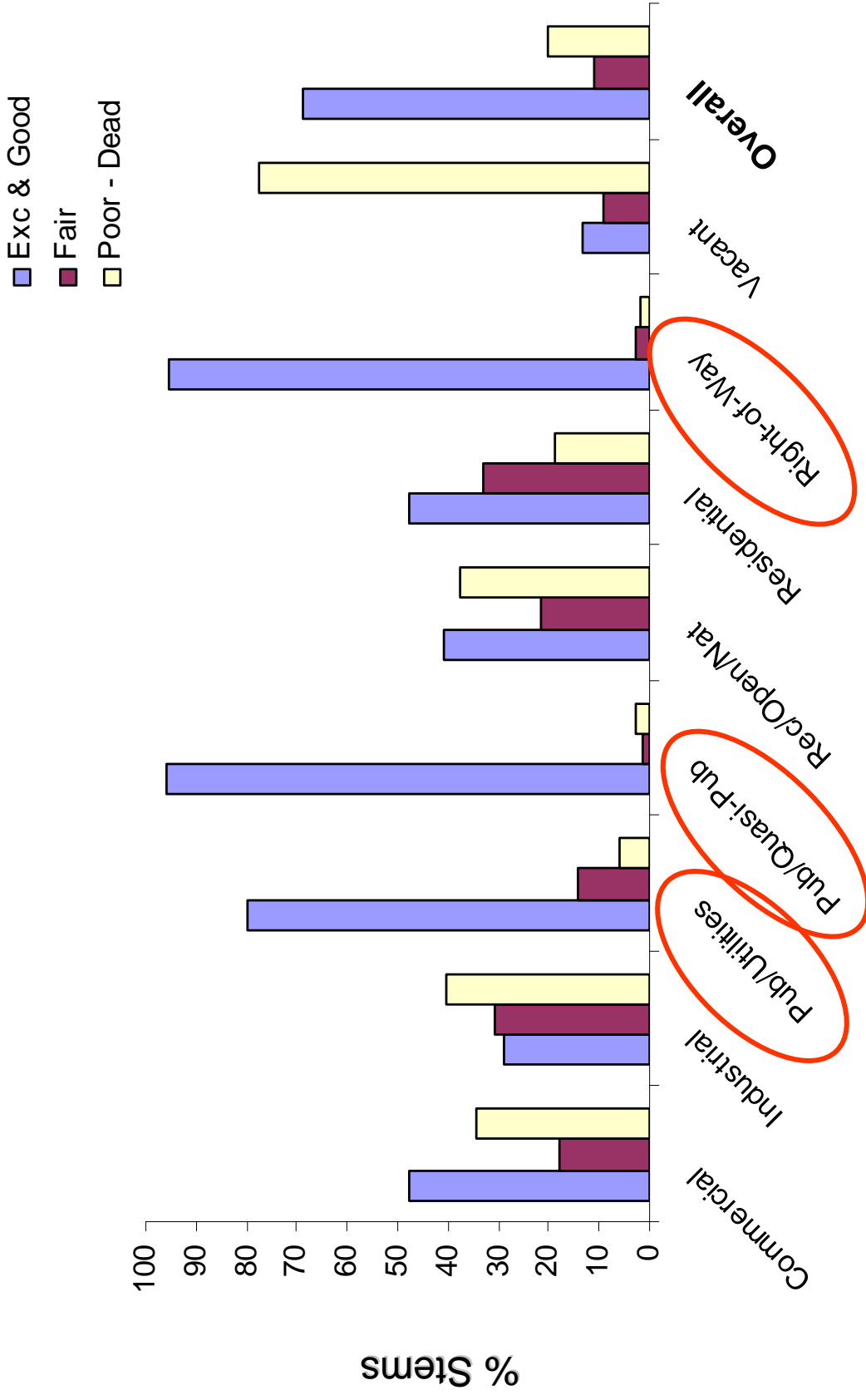
- 63% of all trees are < 6" DBH
- 20% of the 1 - 3" are Brazilian Pepper
- 67% of the trees > 36" are oak



DBH Class (in.)

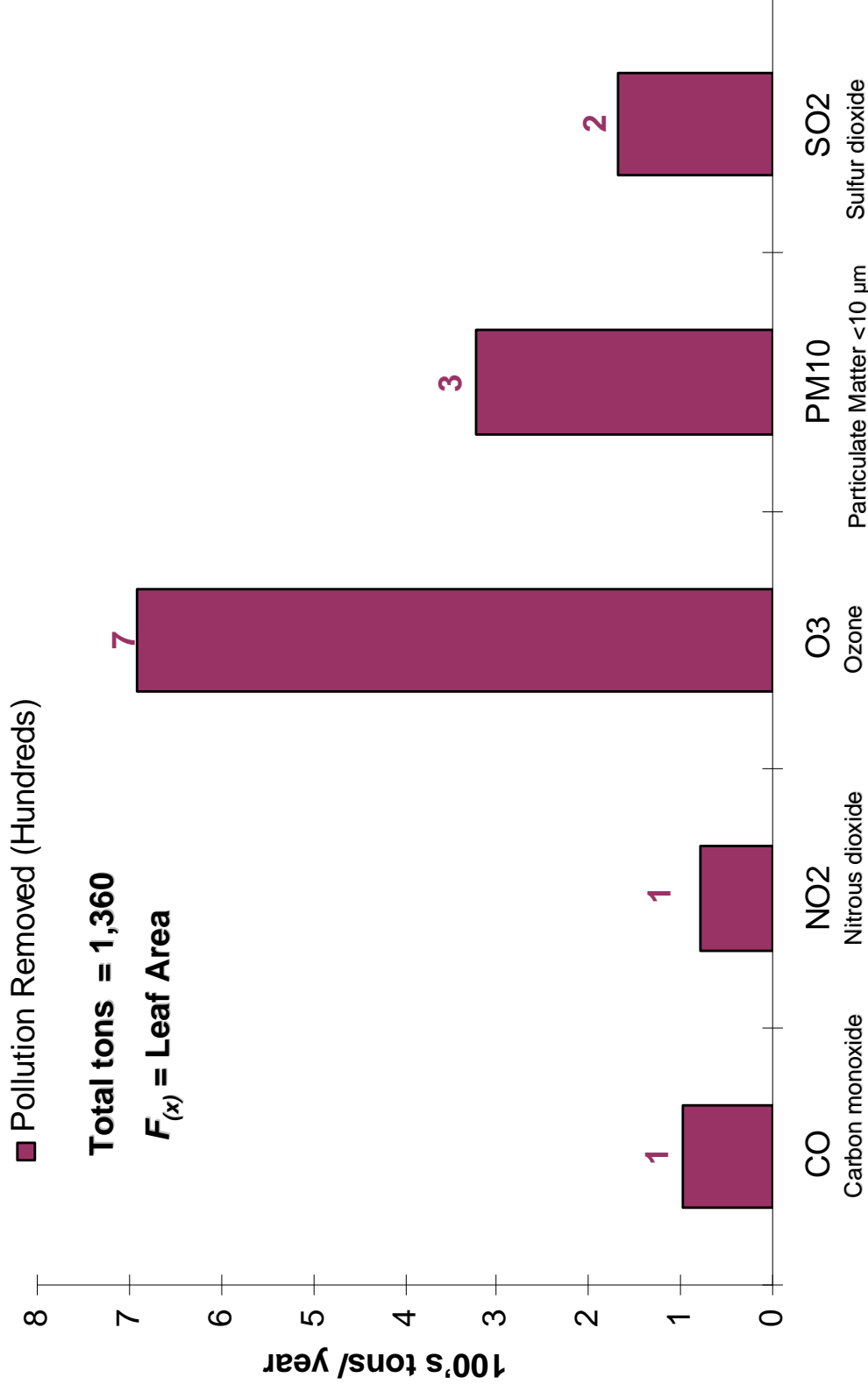


Tree Health by Land Use



2007 - Pollution Removal

1 yr value = \$6.3 million*



* Based upon median externality values



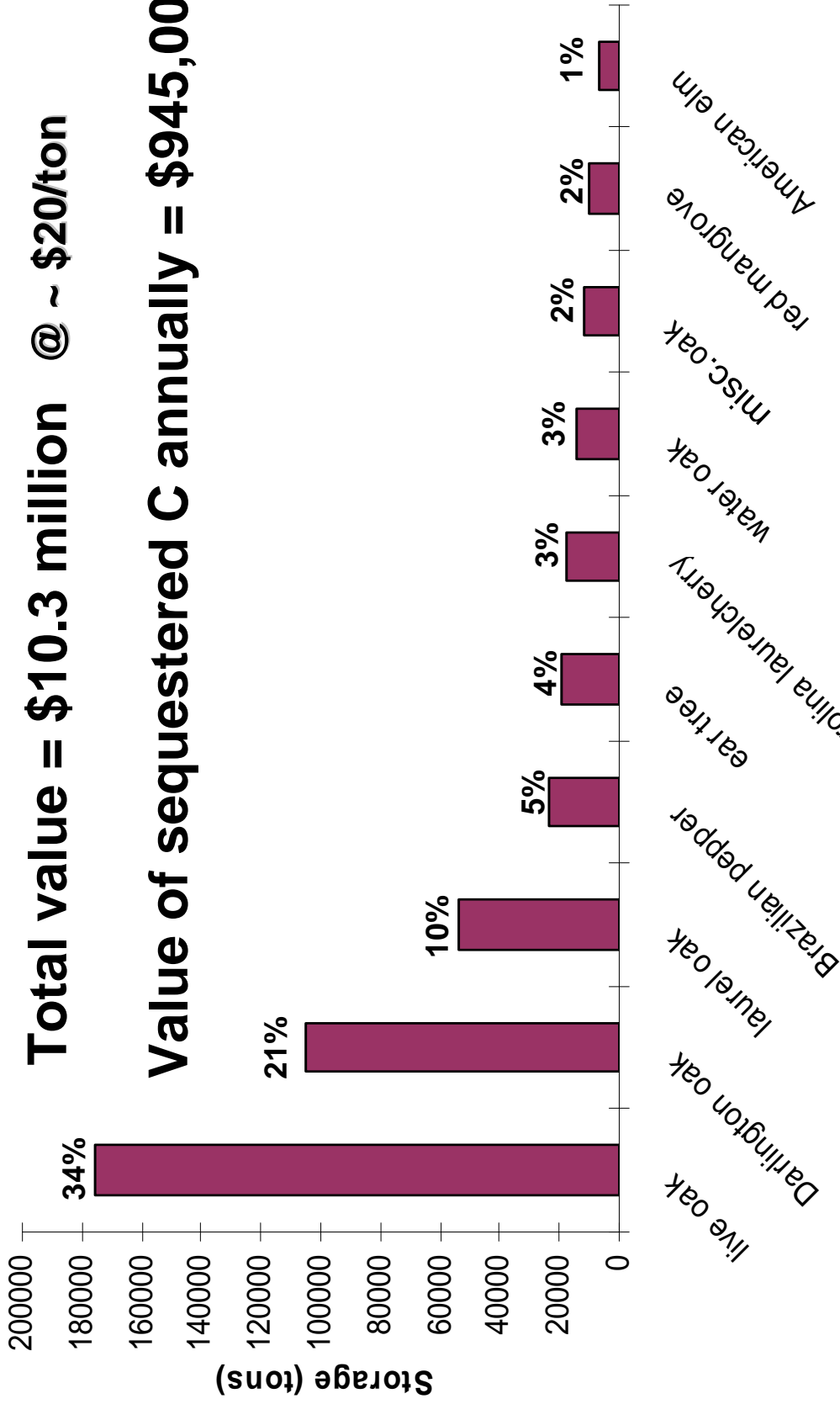
Current Carbon Storage

Relative \$ Contribution

Storage (tons)

Total value = \$10.3 million @ ~ \$20/ton

Value of sequestered C annually = \$945,000



Energy Conservation - 2007

	Heating	Cooling	Total
Energy Conserved			
MBtu ^a	2,994	n/a	2,994
MWh ^b	106	34,637	34,743
Carbon avoided	68	6,117	6,185
US Dollars Saved			
MBtu	\$100,479	n/a	\$100,479
MWh	\$12,141	\$3,967,322	\$3,979,463
Carbon avoided	\$1,389	\$124,292	\$125,681

^a Million British Thermal Unit

^b Megawatt-hour

Urban Forestry Research Indicates

- Urban forest structure affects:
 - Storm water flow & water quality
 - Human health
 - Property values
 - Reduction in violent crime
 - Economics of retail businesses
 - Traffic Calming
 - Biodiversity and habitat



Next Steps

The Mayor's Conference on Community Trees and the Urban Forests

Convention Center

9:00 AM – 12:30 PM, June 19, 2008

Strategies for the Sustainability of Tampa's Urban Forest

Summer 2008





City of Tampa Mayor's Symposium on Community Trees and the Urban Forest

Thursday, June 19, 2008

9 AM – 1 PM

**Tampa Convention Center
333 S. Franklin Street, Tampa, FL**

What's the value of the trees in Tampa? The public is invited to learn about the benefits, current condition and value of Tampa's urban forest. Tampa boasts over 7.8 million trees and participants in the symposium will take part in the first step in the development of a city strategy to manage the city's trees and woodlands in a manner that supports human health and economic and environmental sustainability.

This event is free and open to the public. **Pre-registration is required** via email to: diane.bennett@tampagov.net or call (813) 931-2608 or 931-2104. Space is limited, please reserve early.

Agenda Topics Include:

- Welcome address by Mayor Pam Iorio
- Introductions by Karen Palus, Director of Tampa Parks and Recreation Department and Rob Northrop, University of Florida/ Hillsborough Co. Extension
- *Planning Tomorrow's Cities Today*. Keynote address by Wayne Zipperer, USDA Forest Service
- Results from the *City of Tampa Urban Ecological Analysis 2006-2007* presented by Shawn Landry, University of South Florida and Michael Andreu, University of Florida
- Poster session presentation
- Facilitated working groups to public concerns and issues associated with Sustaining Tampa's Urban Forest led by Terry Johnson, University of South Florida
- Developing a Strategy for Urban Forest Sustainability, presented by Rob Northrop, University of Florida/ Hillsborough Co. Extension



City of Tampa Urban Ecological Analysis 2006-2007 report available at
http://www.tampagov.net/dept_parks_and_recreation

The Mayor's Symposium on Community Trees and the Urban Forest is co-sponsored by the City of Tampa, the University of Florida, the University of South Florida and Hillsborough County Extension.



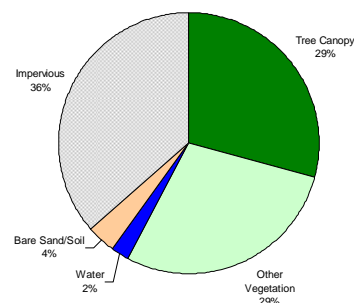
City of Tampa Urban Ecological Analysis 2006-2007

Executive Summary

In October 2006 the City of Tampa's City Council directed the Parks and Recreation Department to oversee an ecological analysis of the city's urban forest resources. This report describes the methodology used to conduct the inventory and assessment; quantifies the change in overall canopy coverage 1996 to 2006; provides a three-dimensional description of the forest structure and composition; and provides a detailed look into some of the economic and ecological values of the City of Tampa's urban forest. The outcomes from this study can serve as the basis for: enhancing the understanding of the urban forest's values, improving urban forest policies, planning and management, and providing empirical data for the inclusion of trees within environmental regulations.

The University of South Florida combined the use of high resolution imagery (1 meter) and a more robust approach to spatial analysis than used in the 1996 study as part of its investigation into urban forest cover and distribution.

- Overall citywide tree cover increased between 1996 and 2006.
- Tree cover in 2006 appears to have returned to 1970's levels.
- High-resolution 2006 land cover classification indicated the City of Tampa was comprised of 29% tree canopy, 29% other vegetation, 2% water, 4% bare sand/soil and 36% impervious surface.
- Residential, public/quasi-public institutional and right-of-way were the top three land use categories in terms of tree canopy, representing over 78% of the 21,716 acres of tree canopy within the City of Tampa.



During spring – early fall of 2007 the University of Florida School of Forest Resources and Conservation and Hillsborough County Extension established two hundred and one plots which were sampled and analyzed to determine the vegetative structure, functions, and values of the urban forest in Tampa.

Definitions of terms used in this report:

1. **Urban Forest:** Urban forests encompass the trees, shrubs, plants, and wild/domesticated animals that live in the area regardless of origin (native/non-native, naturally regenerated, or planted/introduced).
2. **Forest Structure:** a description of the distribution of vegetation both horizontally and vertically. Forest structure attributes are a function of the community of species.
3. **Forest Function:** determined by forest structure and includes a wide range of environmental and ecosystem services.
4. **Forest Value:** an estimate of the ecological and economic worth of the various forest functions.

Summary of Tampa's Urban Forest and associated functional values

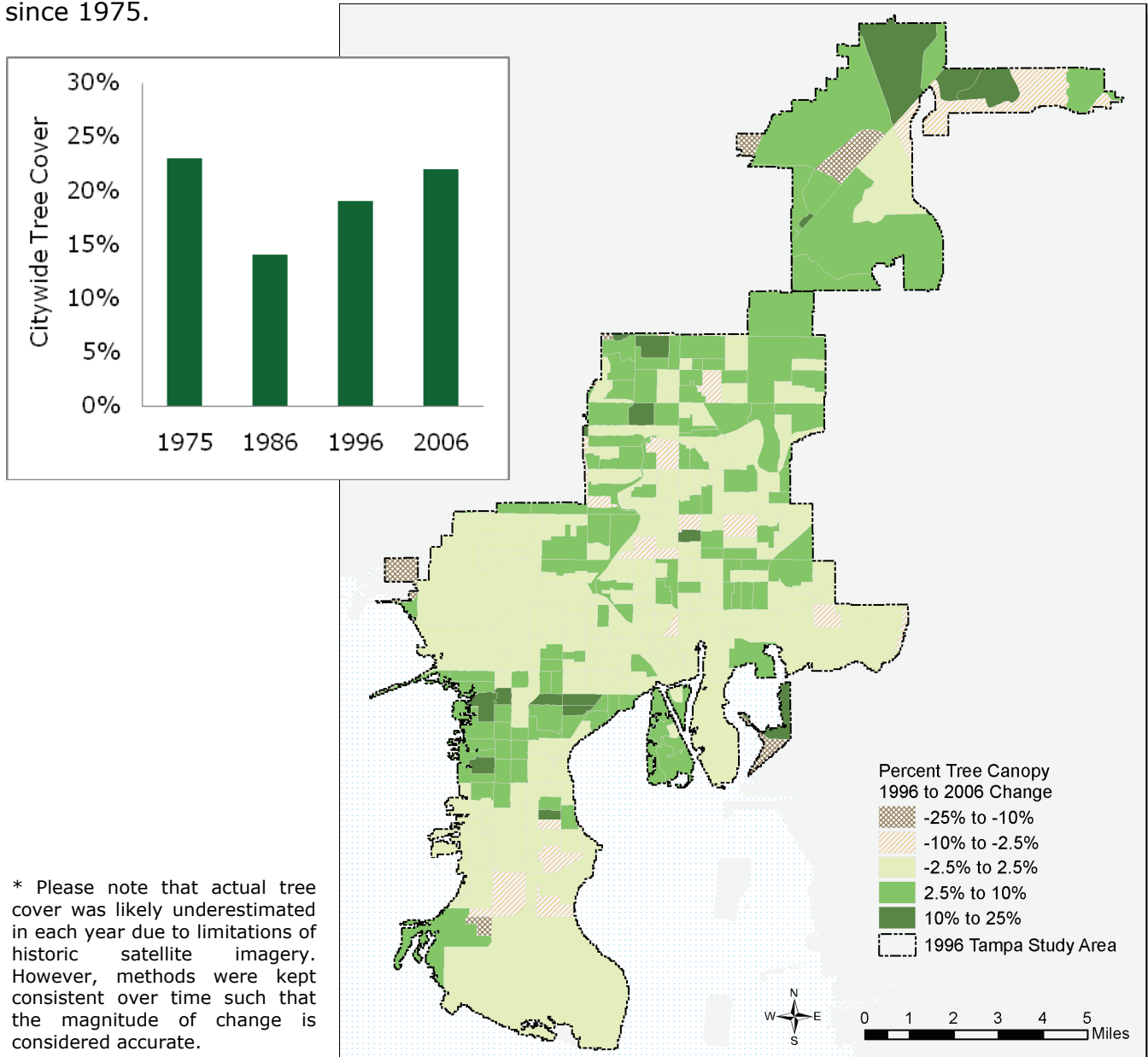
Feature	Measure
Number of Trees	7,817,408
Tree Cover	28.1%
Top 3 Species	red mangrove, Brazilian pepper, black mangrove
Proportion of Trees < 6-inches DBH	84%
Pollution Removal	1,360 tons/year (\$6.3 million/year)
Carbon Storage	511,141 tons (\$10,386,389)
Gross Carbon Sequestration	46,525 tons/year (\$945,396/year)
Value of Energy Conservation	\$4,205,623
Compensatory Value	\$1,465,600,097

City of Tampa Urban Ecological Analysis 2006-2007 full report available at http://www.tampagov.net/dept_parks_and_recreation



City of Tampa Historic Tree Canopy Change

Tree canopy cover in the urban forest can be expected to change over time due to the influence of human and natural factors, such as tree planting and maintenance, preservation requirements, natural disturbances and climatic factors, or other reasons. Historic tree cover was mapped from archived satellite imagery. The City of Tampa experienced an overall increase in tree cover between 1996 and 2006. In fact, after experiencing a net loss in tree canopy cover during the 1970s and 1980s, tree cover in 2006 returned to almost the same amount as in 1975. This map shows tree canopy cover change between 1996 and 2006. The graph shows citywide tree canopy cover change since 1975.



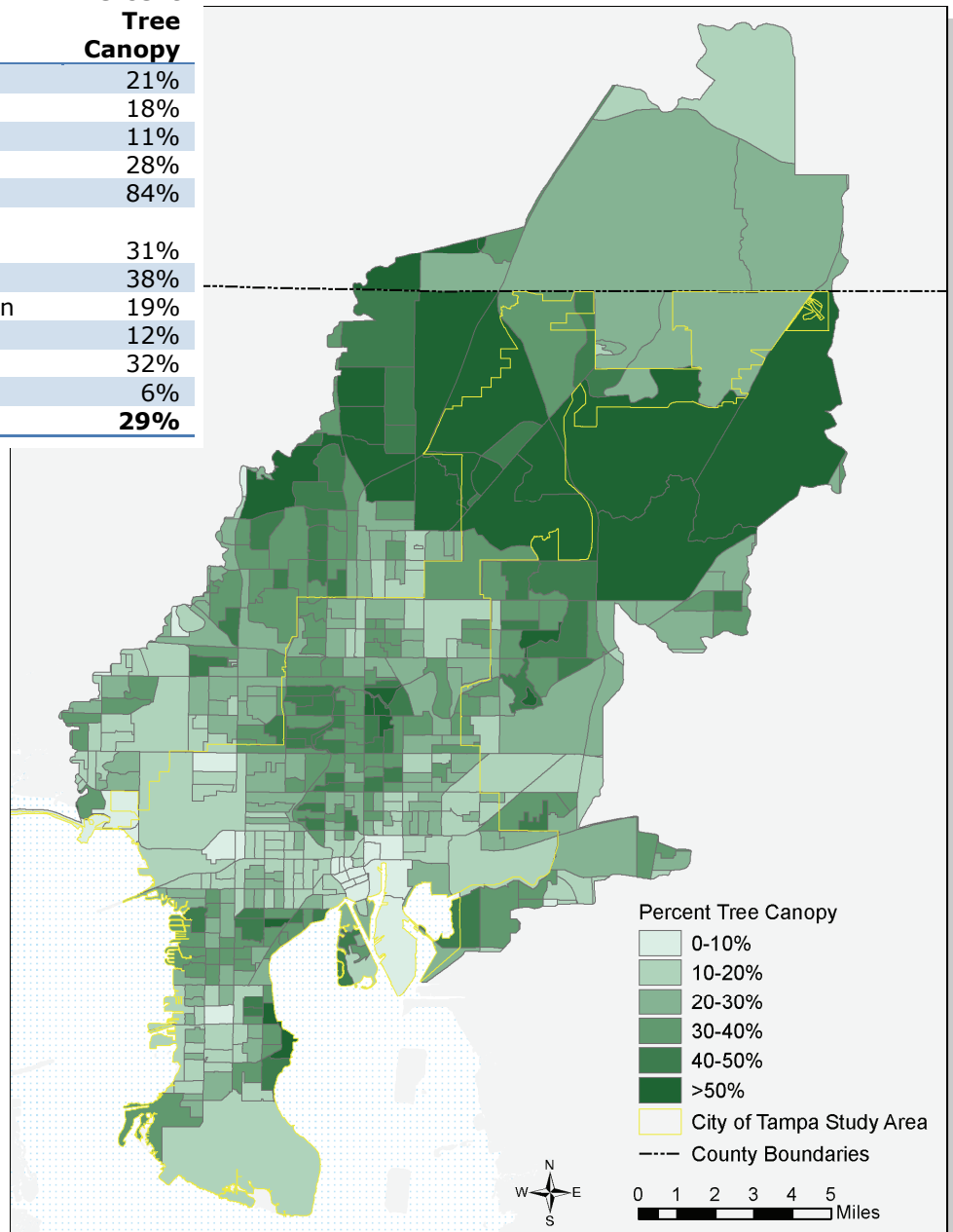
City of Tampa Urban Ecological Analysis 2006-2007 full report available at http://www.tampagov.net/dept_parks_and_recreation



2006 City of Tampa Tree Canopy Cover

The distribution of tree canopy cover is often used as an indicator of the benefits and costs associated with the urban forest. Tree canopy cover was mapped using very high resolution satellite imagery from April, 2006. This map shows where tree canopy cover is located throughout the City of Tampa and the surrounding watershed areas. The data table provides a breakdown of the average tree canopy cover for each land use category for only those areas within the City boundaries.

Land Use Category	Percent Tree Canopy
Commercial	21%
Public / Institutions	18%
Recreational / Open Space / Natural	11%
Right of Way / Transportation	28%
Vacant	84%
	31%
	38%
	19%
	12%
	32%
	6%
Citywide Total	29%



Note: Map shows total tree canopy cover within each Census 2000 block group.

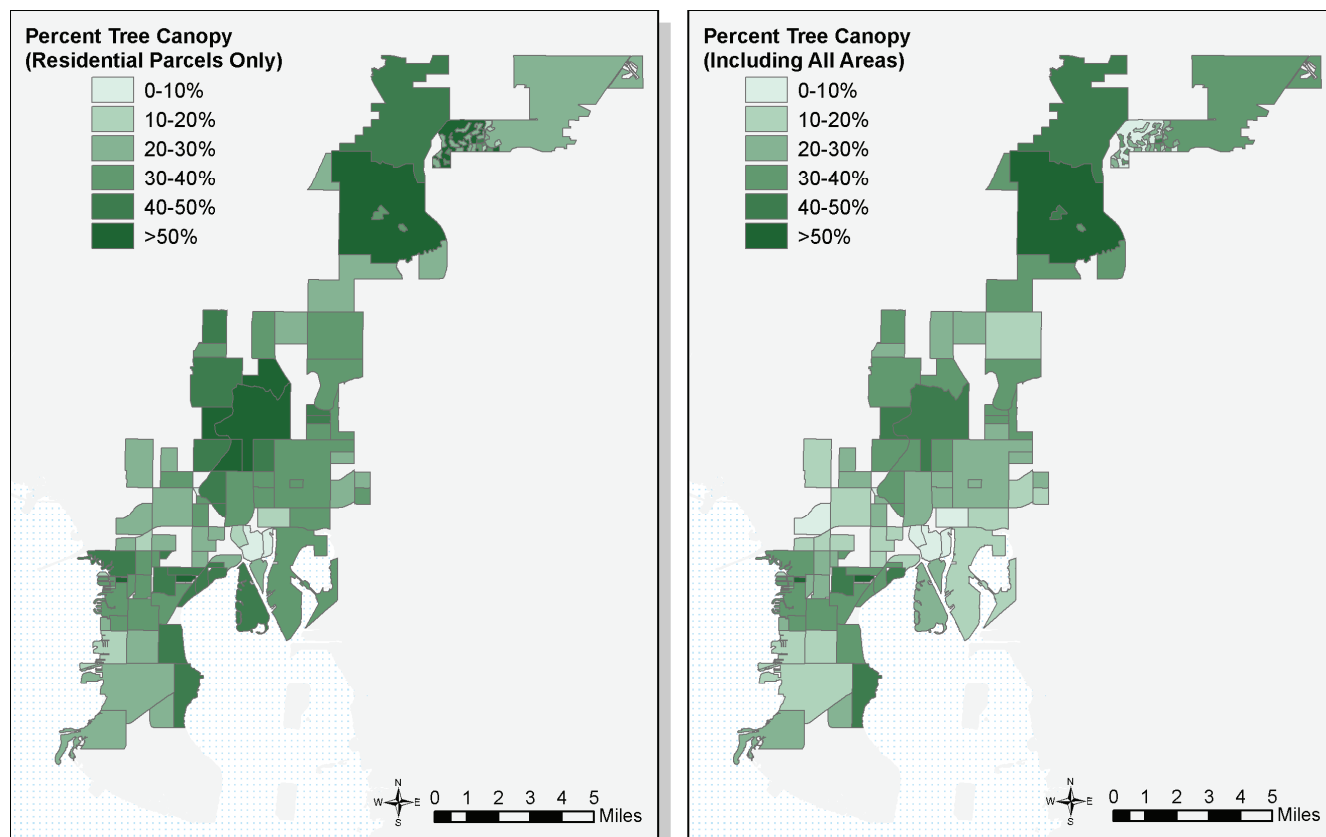
City of Tampa Urban Ecological Analysis 2006-2007 full report available at http://www.tampagov.net/dept_parks_and_recreation



2006 Tree Canopy Cover Summarized by Neighborhood Association in Tampa

Neighborhoods provide a meaningful way to divide a larger city into localized communities where residents, businesses and government representatives can focus on locally relevant issues. The results of the 2006 High Resolution Tree Canopy Cover Assessment, part of the *City of Tampa Urban Ecological Analysis 2006-2007*, was summarized for each neighborhood association based upon the City of Tampa's August 2007 association boundaries.

Neighborhoods are composed of both public and private ownership and land uses. As one might expect, tree canopy cover has often been found to differ on residential properties when compared to commercial, right-of-way and other land uses. The maps below present the average percentage of tree canopy cover calculated for only residential properties (left) compared to all areas within each neighborhood (right).



The extent of existing tree canopy cover does not provide a complete picture of the future tree canopy possible within a neighborhood. Residents of a neighborhood association might be interested in planting additional trees in areas currently covered by lawns and other vegetation. Furthermore, both trees and other vegetation are important components of the urban forest. The table of all neighborhood associations within the City of Tampa as of August 2007 includes percent tree canopy cover, other vegetation cover (e.g. lawns) and the total of all vegetation cover.

Neighborhood Association	Tree Canopy Cover	Other Vegetation Cover	Total of all Vegetation Cover
Ballast Point	42%	20%	62%
Bayshore Beautiful	40%	21%	61%
Bayshore Gardens	34%	15%	49%
Bayside West	16%	26%	42%
Beach Park	34%	19%	54%
Beach Park Isles	18%	14%	32%
Belmar Gardens	30%	27%	57%
Belmar Shores	25%	21%	46%
Bon Air	25%	22%	46%
Bowman Heights	28%	21%	50%
Carver City / Lincoln Gardens	9%	28%	37%
Channel District	3%	6%	9%
College Hill	26%	28%	54%
Cory Lake Isles	9%	65%	74%
Courier City / Oscawana	19%	11%	30%
Culbreath Bayou	55%	15%	70%
Culbreath Heights	21%	26%	47%
Culbreath Isles	31%	17%	48%
Davis Islands Civic Association	29%	26%	55%
Davis Islands Task Force	30%	26%	55%
Drew Park	11%	23%	34%
East Tampa Business & Civic	23%	29%	52%
East Ybor Historic	13%	21%	34%
FairOaks/Manhattan Manor	14%	27%	40%
Florence Villa/ Beasley/Oak Park	15%	27%	43%
Forest Hills Community	30%	34%	63%
Forest Hills Neighborhood	33%	39%	71%
Gandy/Sun Bay South	15%	28%	43%
Golfview	43%	25%	68%
Grant Park	20%	33%	53%
Gray Gables	32%	18%	50%
Harbour Island	25%	8%	33%
Highland Pines	19%	30%	49%
Historic Hyde Park	37%	15%	52%
Historic Ybor	7%	16%	23%
Hunters Green - Brookfield	23%	17%	39%

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Neighborhood Association	Tree Canopy Cover	Other Vegetation Cover	Total of all Vegetation Cover
Hunters Green - Cypress Ridge	27%	17%	45%
Hunters Green - Deer Creek	26%	17%	43%
Hunters Green - Esprit	26%	14%	40%
Hunters Green - Fox Chase	28%	17%	45%
Hunters Green - Hampshire	31%	9%	40%
Hunters Green - Hampton On The Green	29%	15%	44%
Hunters Green - Heather Downs	36%	15%	51%
Hunters Green - Heritage Oaks	19%	33%	53%
Hunters Green - Lakeside	21%	11%	31%
Hunters Green - Laurel Ridge	35%	8%	43%
Hunters Green - Lockwood Links	23%	14%	37%
Hunters Green - Magnolia Chase	27%	17%	45%
Hunters Green - Nathans Court	24%	10%	34%
Hunters Green - Oak Crest	14%	11%	26%
Hunters Green - Oak Trace	32%	10%	43%
Hunters Green - Osprey Point	21%	17%	38%
Hunters Green - Parkside	37%	10%	47%
Hunters Green - Pinnacle	31%	12%	43%
Hunters Green - Quail Creek	27%	14%	41%
Hunters Green - Stonebridge	41%	11%	51%
Hunters Green - Waterforde	20%	12%	32%
Hunters Green - Wynstone	30%	15%	45%
Hunters Green Community	5%	21%	26%
Hyde Park North	20%	14%	34%
Hyde Park Preservation	46%	10%	56%
Interbay	25%	41%	65%
Live Oaks Square	30%	30%	60%
Lowry Park Central	39%	25%	64%
New Suburb Beautiful	55%	11%	66%
New Tampa	33%	38%	71%
North Bon Air	12%	26%	38%
North Hyde Park	15%	19%	34%
North Tampa Community	25%	27%	52%
Northeast Community	31%	25%	56%
Northeast Macfarlane	16%	28%	44%
Northview Hills	21%	36%	56%
Oakford Park	19%	25%	43%
Old Seminole Heights	40%	23%	63%
Old West Tampa	20%	21%	42%
Palma Ceia	30%	20%	50%
Palma Ceia West	23%	22%	45%
Palmetto Beach	15%	24%	39%
Parkland Estates	40%	15%	55%
Plaza Terrace	24%	23%	48%

continued on next page...

Neighborhood Association	Tree Canopy Cover	Other Vegetation Cover	Total of all Vegetation Cover
Port Tampa City	28%	36%	65%
Ridgewood Park	35%	19%	55%
Riverbend	43%	24%	67%
Rivergrove	38%	21%	60%
Riverside Heights	39%	25%	63%
South Seminole Heights	40%	20%	60%
Southeast Seminole Heights	36%	23%	60%
Stadium Area	21%	22%	42%
Stoney Point	27%	18%	45%
Sulphur Springs	36%	22%	58%
Sunset Park	37%	20%	57%
Swann Estates	27%	22%	49%
Tampa Downtown Partnership	5%	9%	14%
Tampa Heights	25%	25%	50%
Tampa Palms	67%	15%	82%
Tampa Palms - The Kensington	30%	15%	45%
Tampa Palms - The Sanctuary	48%	21%	69%
Temple Crest	32%	25%	56%
Terrace Park	20%	32%	52%
The Marina Club Of Tampa	6%	17%	23%
Undefined Neighborhood	19%	37%	56%
University Square	25%	28%	52%
Uptown Council	7%	9%	16%
Virginia Park	30%	23%	53%
VM Ybor	24%	20%	44%
Wellswood	32%	24%	57%
West Meadows	45%	25%	70%
West Riverfront	19%	23%	42%
Westshore Palms	19%	24%	44%
Woodland Terrace	40%	29%	69%
Ybor Heights	29%	21%	50%

City of Tampa Urban Ecological Analysis 2006-2007 full report available at
http://www.tampagov.net/dept_parks_and_recreation



Methods Used During the Ecological Assessment

What is the purpose of the Urban Ecological Analysis?

The ecological assessment provides a detailed look into some of the economic and ecological values of the City of Tampa's urban forest. The outcomes from this study can serve as the basis for: enhancing the understanding of the urban forest's values, improving urban forest policies, planning and management and providing empirical data for the inclusion of trees within environmental regulations.

When did the assessment of Tampa's urban forest take place?

The field work for the urban forest assessment was conducted from February to July, 2007. Data analysis and reporting was completed in the Spring of 2008.

How many plots were studied?

A total of 201 permanent inventory plots were located within Tampa's political boundary. A systematic random sampling design was used to achieve a complete geographic distribution of inventory plots throughout the city and to ensure that an accurate, unbiased assessment was conducted. Precise latitude and longitude readings from GPS units for each plot location will allow researchers to relocate the plots over time to monitor changes in Tampa's urban forest structure and function

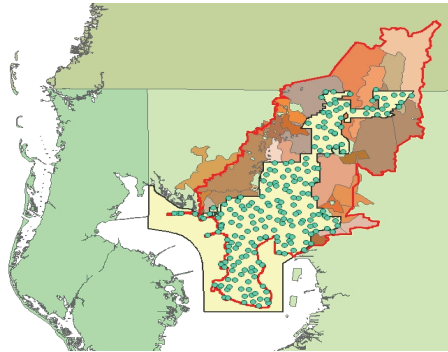


Figure 1: Distribution of study plots.

What information was gathered for the assessment?

Data collected during the assessment included land use, the percent of ground, shrub, tree and palm cover by species, tree diameter, tree crown width, total height, height to the live crown and tree health attributes. Obtaining these data for each plot assisted the team in understanding the structure of the forest, which then allowed them to determine the urban forest's contribution to pollution reduction, carbon sequestration and storage, conservation of energy use and economic value to the city and its residents.

What methods were used to analyze the collected data?

The team utilized the **Urban Forest Effects Model (UFORE)** created by the U.S. Forest Service to assist with the analysis of the data collected. The model has been designed to calculate values for variables such as tree diversity, species origin, abundance, density, size, cover and leaf area by land use categories. The model quantifies the following urban forest functions: energy savings, air pollution removal, carbon storage, carbon sequestration and compensatory or replacement values.

The Structure of Tampa's Urban Forest

What is the structure of a forest?

Forest structure refers to the distribution of vegetation (woody and herbaceous), both horizontally and vertically across a given area. The structure of the urban forest changes over time as plants grow, die or are added to a particular location. The structure of an urban forest influences the way the forest functions and the environmental services it can provide. For example, if reducing wind to slow soil erosion in an area is desirable, then an urban forest structure that has few overstory trees and shrubs with sparse grass and vegetation would not be as effective as one with a dense tree and shrub canopy with dense grass and vegetation.

What attributes are measured in a forests' structure?

Various physical attributes of the forest vegetation are measured and calculated to determine forest structure such as: tree density, diameter and height distribution, crown area/cover, tree health, leaf area and biomass. When the urban forest can be quantified and its structure identified, it is then possible to relate its structure to specific functions, such as energy conservation, carbon storage and sequestration, and pollution reduction

Why is it important to understand the diameter distribution of a Forest?

In Tampa, over 80% of the trees were smaller than 6 inches in diameter. In Tampa, over 80% of the trees were smaller than 6 inches in diameter (Figure 1). This would lead most to believe that the population of trees is mostly young, immature trees. However, 73% of the 1 to 3 inch trees are mangroves and Brazilian pepper. These two species tend to maintain a small diameter throughout their life and do not grow to large sizes.

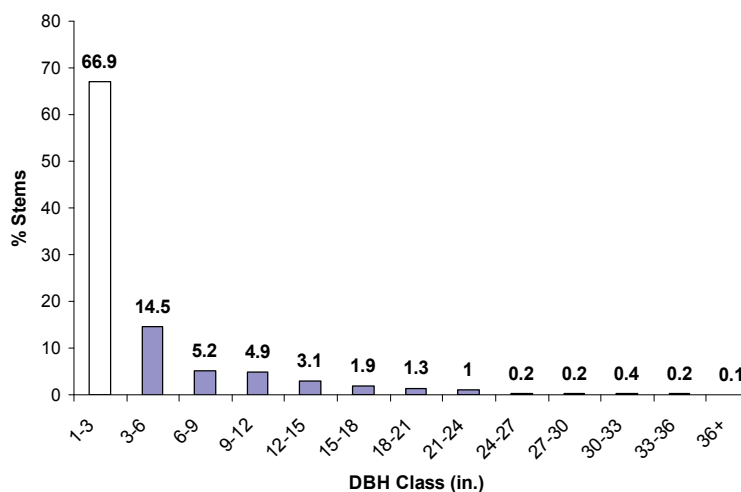


Figure 2: Diameter distribution of the trees in Tampa.

Trees greater than 36 inches in diameter represent just a tenth of one percent of the total population of trees in the city. Trees of this size consist, in large part, of native long-lived species such as oaks and bald cypress. If managers and planners want to ensure larger diameter trees exist on the landscape, they will need to be replaced over time. By understanding the diameter distribution and species information, a comprehensive strategic management plan can be developed to meet this objective. But it is important to keep in mind that both large and small diameter trees are important to ensure the diversity of structures that support the variety of values the urban forest provides.

Composition of Tampa's Urban Forest

What is the composition of Tampa's urban forest?

Tampa is located in the transitional climate zone between tropical south Florida and temperate north Florida. On our study plots we identified 93 different tree species in Tampa. This represents a unique and diverse suite of species coexisting in Tampa's urban forest.

What is the diversity of Tampa's urban forest?

Diversity or species richness is simply the number of species in a given land area. Diversity is an important attribute in the urban forest and can be an indication of its vulnerability or resiliency to such natural disturbances as insect and/or disease outbreaks. Areas that have low species diversity are more likely to be less resilient to such disturbances.

How many trees are in Tampa's urban forest?

It is estimated that there are over 7.8 million trees in Tampa. For this study, a tree is defined as a woody stem with a diameter of 1 inch or greater at 4.5 feet. The top 10 most common tree species in Tampa are red mangrove (*Rhizophora mangle*), Brazilian pepper (*Schinus terebinthifolius*), black mangrove (*Avicennia germinans*), white mangrove (*Laguncularia racemosa*), live oak (*Quercus virginiana*), laurel oak (*Quercus laurifolia*), Darlington oak (*Quercus hemisphaerica*), cabbage palm (*Sabal palmetto*), Carolina laurel cherry (*Prunus caroliniana*) and white lead tree (*Leucaena leucocephala*) (Figure 2).

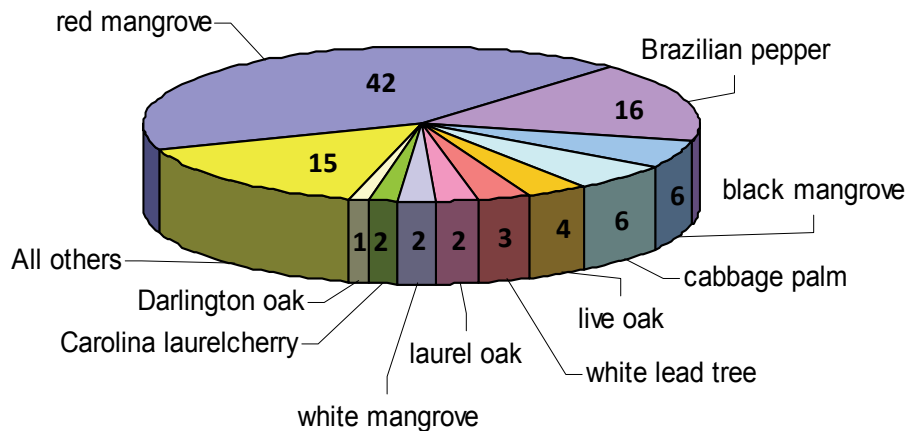


Figure 3: Relative percentage of tree species by number of stems in Tampa.

Native and Exotic Species in the Urban Forest

What is the difference between native and exotic species?

Native species are defined as those that were found in Florida prior to European colonization in the 16th century. Exotic (non-native) species are outside of their native range and have been introduced to Florida by humans, either intentionally as crops, ornamentals, etc. or by accidental transport across natural boundaries via boats, trains, and/or automobiles.

What is an invasive species?

Some of the tree species in Tampa are also classified as “invasive.” Invasive species are able to spread into and dominate an area due to a lack of natural predators and/or diseases. Invasive species tend to be non-native but can also be native. Regardless, invasive species are considered as such because they negatively impact the ecological functions of the forest by reducing species diversity. Species diversity is necessary to maintain the resilience of the urban forest, especially when considering natural disturbances and the forests ability to provide efficient ecosystem services such as nutrient cycling (preventing nutrient loading), air pollution reduction, carbon sequestration, and habitat availability.

Does Tampa’s urban forest have non-native and invasive species?

Of the 93 tree species found in Tampa, 76% are native to North America. Of those, approximately 50% are considered to be native to Florida (Figure 1). From an ecological perspective the fact that only half of the species are native to this state is less than desirable. But perhaps of greater concern is that one of the most common tree species in Tampa, Brazilian pepper (*Schinus terebinthifolius*), is both non-native and invasive. It readily spreads into disturbed areas such as fields and ditches, along canals and in flat wood forests, creating thickets that are costly to eradicate. The dominance of this species is not confined to Tampa as it is estimated to be established on over 1 million acres throughout the state.

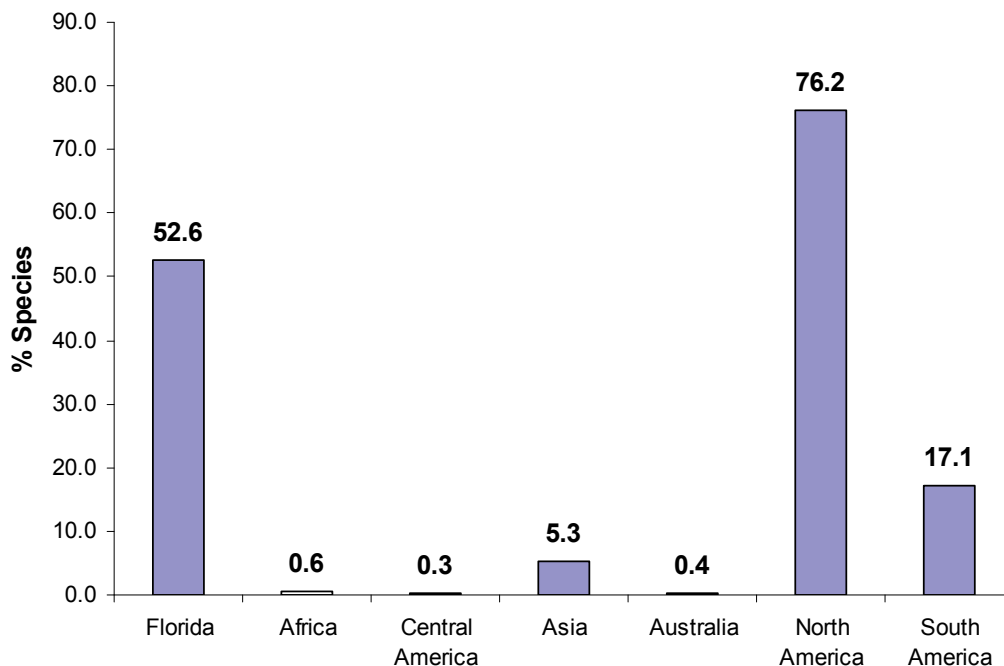


Figure 4: Percentage of tree species found in the study by their respective region of origin. Species native to Florida are a subset of the species native to North America.

Tree, Shrub and Ground Cover of the Forest

What is tree cover?

Tree canopy cover is a common metric used to quantify the amount of area directly and indirectly influenced by trees. It is ecologically important because it indicates how much of an effect the forest has on the micro-climate (e.g. shade in parking lots and homes) as well as how much rain is intercepted by the trees. Tree cover is also important because it helps provide shade, acts as a windbreak, and helps reduce air pollution.

How much tree cover is in Tampa?

The UFORE study results show that the city wide average tree cover is approximately 28%.

What is shrub cover?

Shrub cover is often overlooked and undervalued as a component of the urban forest. Like tree cover, it is an estimate of the amount of area in the urban forest covered by shrubs. Shrub cover is an important attribute of the urban forest because it adds structural complexity and diversity, both of which have ecological and aesthetic value. In addition to providing some of the same benefits as trees, such as preventing soil erosion and nutrient runoff, shrubs also help remove pollutants from the atmosphere.

How much shrub cover is in Tampa?

In Tampa, it is estimated that approximately 13.5% of the city is covered with shrubs.

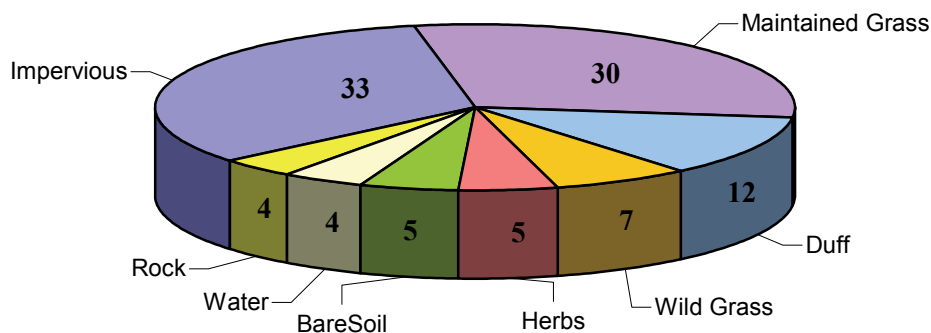
What is ground cover?

Ground cover is divided into two broad categories: impervious (asphalt, buildings, and cement) and pervious (bare soil, duff, herbs, maintained grass, rock, un-maintained grass and water) surfaces. Urbanization tends to increase the amount of impervious surface, which affects hydrological processes that occur such as aquifer recharge and surface runoff. Pervious surfaces allow the natural cycle of rainfall and stormwater flow to soak into the ground and maintain a healthy and plentiful aquifer.

How is ground cover distributed in Tampa?

Thirty three percent of the ground cover in the city is classified as impervious. The remaining 77 percent consists of pervious surfaces, including maintained grass, rock, water, bare soil, herbs, wild grass and duff (Figure 1).

Figure 5: Distribution of ground cover types in Tampa.



The Palms of the Urban Forest

What are palms?

Palms are monocots or grass-like plants but they can grow tall and have woody stems like trees. While not truly trees, they perform many of the same functions as trees, such as providing cover, controlling air pollution and controlling carbon storage and sequestration.

How many palms are in Tampa?

In 2007, the total number of palms in Tampa was estimated to be 584,658. Palm species represent 7% of the trees of Tampa's urban forest.

What is the most common palm?

Cabbage palm is the most abundant palm in Tampa, accounting for six percent of the urban forest. It is also the state tree of Florida and is the only native palm of large stature found in the city. Cabbage palm is one of the top ten dominant species found in the urban forest and accounts for 75% of all palms in Tampa (Figure 1). Cabbage palms are tolerant of both drought and high water tables, and therefore can exist across a broad spectrum of growing conditions. Within the urban environment it is found in parks and other natural areas. Due to the cabbage palm's high level of wind resistance it makes an ideal palm for planting near buildings and in public areas.

Are there other Florida native species of palms in the urban forest?

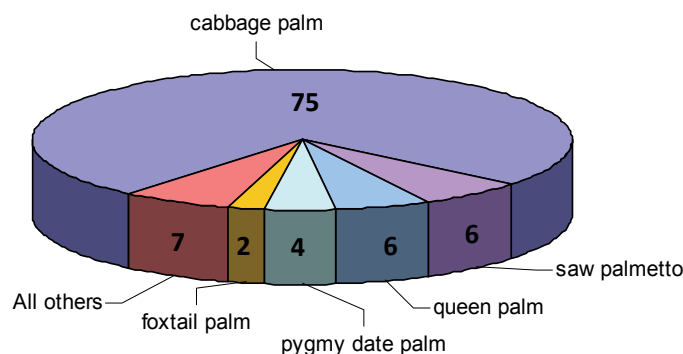
Saw palmetto (*Serenoa repens*) is the second most common of all palms in the city and is native to Florida. In less urbanized forested areas, saw palmetto is often seen as the thick palm ground cover beneath open pine woodlands. Like the cabbage palm, saw palmetto is naturally drought and insect resistant.

In addition to these native palms, many non-native palms are used to provide a distinct structural element to the city's landscape and palm species have been consistently used on residential sites and public rights-of-way to accent the city's sub-tropical climate.

Are there significant diseases affecting palms in Tampa?

Yes! One such disease is *Fusarium oxysporum*, a fatal fungal disease. This disease affects queen palm (*Syagrus romanzoffiana*), the third most common palm in the city (5.8%), and Mexican fan palm (*Washingtonia robusta*), another of the more common (1.7%), large stature palms. Researchers now suggest that the pathogen is likely being spread by wind and that palms should not be replanted onto a site where one with this disease was removed before. Another disease affecting palms in Tampa is the *Texas Phoenix palm decline*, a fatal bacterial disease. This disease affects Canary Island date palm (*Phoenix canariensis*), edible date palm (*Phoenix dactylifera*), wild date palm (*Phoenix sylvestris*) and cabbage palm, the most abundant palm in Tampa.

Figure 1: Relative number of the top five palm species based on the number of stems.



Mangroves in the Urban Forest

What are mangrove forests?

Mangrove forests are a rare ecological community within North America. Because of their sensitivity to sub-freezing temperatures the distribution of mangrove forests in the continental United States is limited to the southeast, including the coasts of North and South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana and Texas. These forests make up approximately 50 percent of the total number of trees in Tampa's urban forest.

Are there different types of mangrove trees?

The mangrove forest of Tampa includes three tree species that are collectively called mangroves; red (*Rhizophora mangle*), black (*Avicennia germinans*) and white (*Laguncularia racemosa*) mangrove. These three types are found in distinct but overlapping ecological zones along the coastline and coastal strands. Red mangroves are the most common (84%) followed by black (11%) and white (5%) (Figure 1).

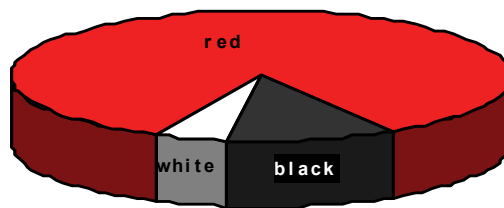


Figure 6: Relative portion of mangrove species in Tampa.

Why are mangrove forests important?

The mangrove forest is valued for its ability to filter out pollution, stabilize sediments and protect the shoreline from erosion. Mangrove forests are an integral part of the ecological functionality of the Tampa Bay estuary because they provide food, nesting and nursery areas for a great variety of fish, shellfish, birds and other wildlife. The mangrove forests also provide habitat for many of Florida's threatened and endangered species of plants and animals.

What is the value of these mangrove forests?

The mangrove forest contributes a total of \$221 million to the structural value of Tampa's urban forest. This does not account for the economic value related to sport and commercial fisheries industries or the value of the ecological services mangroves provide such as nutrient cycling, erosion control, habitat, etc. Mangrove forests also help protect the inland areas from storm surges during strong tropical storms and hurricanes.

Are there regulations involving mangroves?

Mangrove trimming and alteration are regulated through the Florida 'Mangrove Trimming and Preservation Act' as amended by the 1999 Florida Legislature. The intent of the legislature is to protect and preserve mangrove resources valuable to our environment and economy from unregulated removal, defoliation and destruction. This legislation ensures that the mangrove forests are managed in a scientific manner while protecting the rights of property owners.

Urban Forests Conserve Energy

How can urban forests conserve energy?

Trees can reduce the energy needed to heat and cool buildings by lowering temperatures and shading buildings during the summer, and blocking winds during the winter. However, they can also increase energy use by shading buildings in winter but that is not a major concern in this part of Florida. Therefore, the proper placement of trees near buildings is critical for conserving energy used by buildings. Lowering building energy use has the added effect of reducing greenhouse gas emissions from power plants that produce the energy.

What types of trees are used to conserve energy?

Deciduous trees, such as red maple lose all or most of their leaves throughout the year. Deciduous trees are known to be excellent energy conservation trees because they generally grow a large canopy of foliage that can shade a building during the hot summer months, but then lose their leaves during the winter months allowing the sunlight to warm the building.

Evergreen trees, such as slash pine, do not lose their foliage during the year. The structure of evergreen trees is better adapted to block winds and provide dense shade. Since evergreen trees do not typically lose their foliage during the winter, they also act as a wind barrier and protect homes from harsh gusts of wind.

What is the value of energy conserved by trees for residents of Tampa?

During 2007 the total amount of energy conserved in cooling residential buildings within the City of Tampa was estimated to be 34,743 MWh's (megawatt hours), equaling a value saved of approximately \$3.9 million. The amount of energy conserved by reducing the need to heat buildings was 2,994 MBtu (million British thermal units), saving an additional hundred thousand dollars. As a result of these savings it was estimated that the total amount of carbon emissions avoided from burning fossil fuels at power plants was 6,185 tons and saved another \$1.25 hundred thousand dollars. In total, trees helped to conserve energy and saved the residents of Tampa approximately \$4.2 million dollars in 2007 (Table 1).

Table 1: Energy conserved and associated dollar values due to the proximity of residential buildings to in 2007.

	Heating	Cooling	Total
Energy Saved			
Mbtu ^a	2,994	n/a	2,994
Mwh ^b	106	34,637	34,743.00
Carbon avoided	68	6,117	6,185
US Dollars Saved			
Mbtu	\$100,479	n/a	\$100,479
Mwh	\$12,141	\$3,967,322	\$3,979,463
Carbon avoided	\$1,389	\$124,292	\$125,681
Total Dollars Saved	\$114,009	\$4,091,614	\$4,205,623

^a Million British Thermal Unit

^b Megawatt-hour



Compensatory (Replacement) Value of Tampa's Urban Forest

What does the "compensatory value" of the urban forest mean?

The compensatory value of the urban forest of Tampa is an estimate of the amount of money it would cost to replace a tree with a similar species. The compensatory value of the urban forest was calculated based on the guidelines published by the Council of Tree and Landscape Appraisers (CTLA) (8th ed., 1992).

Compensatory value is based on four factors:

1. trunk area (cross sectional area at 4.5 ft in height)
2. tree species
3. tree condition (health)
4. tree location

How much is the compensatory value of Tampa's urban forest?

The estimated compensatory value of Tampa's urban forest is approximately \$1.47 billion dollars. A compensatory value was estimated for all tree species that occurred in the 2007 inventory, including those considered to be problematic (e.g. Brazilian pepper), and contribute to the total value of Tampa's urban forest. Initially it seemed logical to remove these trees from the appraised value, but because they are part of Tampa's urban forest, there will be a cost associated with replacing them. Therefore, all of the trees in the urban forest were included.

The compensatory value is only the replacement value and does not include the value of the many other environmental services provided by the trees in Tampa's urban forest. The urban forest is an asset that is part of the city's infrastructure and is providing many services to the city at a relatively low investment and maintenance cost.

How can the compensatory value of the forest be used?

The compensatory value is regularly used to determine monetary settlement for damage or death of plants through litigation, insurance claims, loss of property value for income tax deductions and real estate assessments. It is based, in part, on the replacement cost of a similar tree (size, health, location) of the same or similar species and is an estimate of the amount of money the tree owner should be compensated for tree loss. In the case of Tampa, the compensatory value is an important figure to estimate damage to the urban forest following large storm events such as a hurricane. Frequently the Federal and State government need quantitative estimates from city officials to justify sending emergency relief. This figure can be used as a basis for estimating the current value of the urban forest, should such an event occur.



Air Pollution Removal and the Urban Forest

What are some of the most serious air pollutants for human health?

Some of the most serious air pollutants in an urban environment are carbon monoxide (CO), nitrogen dioxide (NO₂), ground-level ozone (O₃), particulate matter (PM₁₀) and sulfur dioxide (SO₂). CO is a toxic gas that enters the atmosphere through the burning of fossil fuels (e.g. automobiles and power plants). NO₂ is a respiratory irritant that can cause serious health problems. It is also an ingredient in the formation of ground-level ozone (smog). Smog can cause many health problems including, coughing and nasal congestion, irritating those with asthma and emphysema. Smog is also known to lead to eye and nose irritation which can damage the membranes that protect the body against diseases. Smog is created when sunlight, NO₂ and other volatile organic compounds react with one another. PM₁₀, particles less than 10 micrometers, are other air pollutants that cause health problems by penetrating the lungs when inhaled.

How can the urban forest help reduce air pollution?

One way trees remove gaseous air pollution is by direct uptake through their leaves during the process of photosynthesis. Once inside the leaf, gases may be absorbed by water to form acids or react with inner-leaf surfaces. Trees also remove pollution by intercepting airborne particles. Some particles can be absorbed into the tree but most particles are retained on the plant surface. Particles remaining on the plant surface are often re-suspended into the atmosphere, washed off by rain, or dropped to the ground when the leaf and twig fall. Consequently, vegetation is only a temporary retention site for many atmospheric particles.

Trees play a key role in lowering temperatures in urban areas by shading buildings and pavement. Since the formation of smog can be correlated to increased urban temperatures, the shading affect of trees can promote a reduction in the rate of ground-level ozone formation, or smog. An individual tree or shrub's ability to remove pollutants from the air is related to its canopy size and overall vigor.

How much air pollution can the urban forest remove?

In 2007, it was estimated that Tampa's urban forest removed approximately 1,360 tons of pollution, with an estimated value of \$6.3 million dollars. Two-thirds of the removed air pollution (894 tons) is attributed to the trees in Tampa's urban forest. The other one-third of air pollution removed (466 tons) is attributed to shrubs, highlighting the importance of the urban forest as a whole (Table 1).

	Pollutant	English (short) tons	US Dollars
Trees	CO	66	\$57,367
	NO ₂	52	\$318,661
	O ₃	456	\$2,796,010
	PM ₁₀	209	\$855,141
	SO ₂	111	\$165,773
Shrubs	CO	32	\$27,570
	NO ₂	27	\$167,738
	O ₃	236	\$1,446,730
	PM ₁₀	115	\$469,239
	SO ₂	56	\$84,366
Total		1360	\$6,388,595

Table 1: Tonnage and associated dollar values for pollutants removed by trees and shrubs in Tampa, 2007.

Carbon Storage and Sequestration

How do urban forests help to store and sequester carbon?

As trees grow they remove/sequester carbon dioxide (CO₂) from the atmosphere to use during metabolic processes and store it as woody tissue (carbon storage). Therefore, a growing tree sequesters carbon annually and stores it for the life of the tree. The amount of carbon sequestered and stored over time is a function of a tree's stature and lifespan. Young trees tend to sequester carbon faster than older trees due to their increasing vigor. Long-lived trees store carbon for a longer period of time than shorter-lived trees because when a tree dies most of the stored carbon is released back to the atmosphere as it decomposes. The time span for carbon storage can be extended if the wood from the tree is used to make a product (i.e. furniture).

Why is storing and sequestering carbon important?

Over time, the global carbon cycle has changed and the concentration of CO₂ in the atmosphere is currently increasing. While there are many sources of CO₂ one of the largest sources over the last century is due to the burning of carbon rich fossil fuels (oil, coal and natural gas). Since CO₂ is a greenhouse gas this accumulation is contributing to changes in average global temperatures and climate changes worldwide. These changes in temperature and climate will lead to changes in rainfall patterns, increase storm events and rising sea levels. These are impacts that have long term ecological, economic, social and political effects for us and future generations.

How do we help urban forests store and sequester carbon?

In order for trees to sequester and store as much atmospheric carbon as possible, they need to be healthy. Trees in our communities need to be actively managed to maintain their optimal health. This management comes at a cost, but represents an investment by the community in the long-term health and vigor of the urban forest. Just as we want to encourage the management of the living trees it is important to recognize the value of dying and dead trees. They serve an ecological role by providing ecosystem services and provide habitat for wildlife. In Tampa, the urban forest sequesters more carbon than it emits and this amount can be increased over time through sound management of existing and newly planted trees.

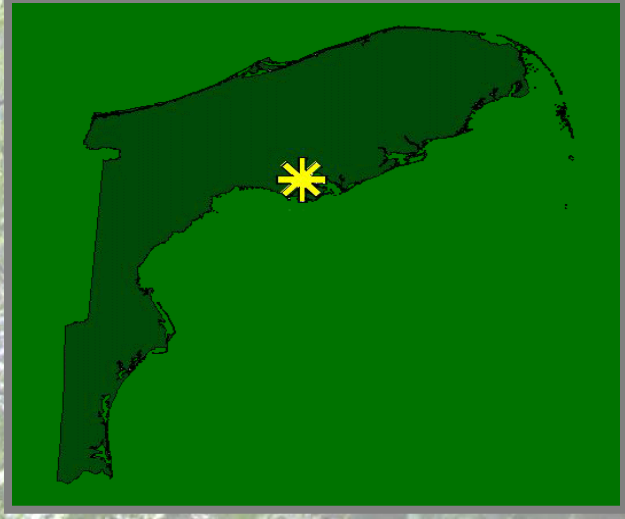
Can urban forests help the with environmental policy initiatives?

On July 13, 2007 Florida Governor Charlie Crist signed three executive orders addressing climate change, increasing energy efficiency, and pursuing more renewable energy sources. In February 2008, Tampa Mayor Pam Iorio signed the U.S. Mayors Climate Protection Agreement to reduce greenhouse gas emissions. For these goals to be met urban forests will be an integral component of the solution. They sequester and store carbon, offsetting emissions from human activities, increase energy efficiency of homes and buildings by reducing cooling needs and can act as a feedstock for alternative fuel production.

What is the value of stored and sequestered carbon in Tampa's urban forest?

Carbon credits are a commodity that are bought and sold in many parts of the world today. Therefore, the amount of carbon sequestered by the trees in Tampa's urban forest has a monetary value. The total carbon stored in Tampa's urban forest is estimated to be over 500,000 tons and has a value of \$10.3 million dollars if sold at ~\$20 per ton. The total carbon sequestered by Tampa's urban forest is about 46,525 tons per year, and which could generate \$1 million dollars annually if sold.





City of Tampa Urban Ecological Analysis 2006-2007

University of South Florida

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University of Florida

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University of Florida – Hillsborough County Extension

Robert J. Northrop



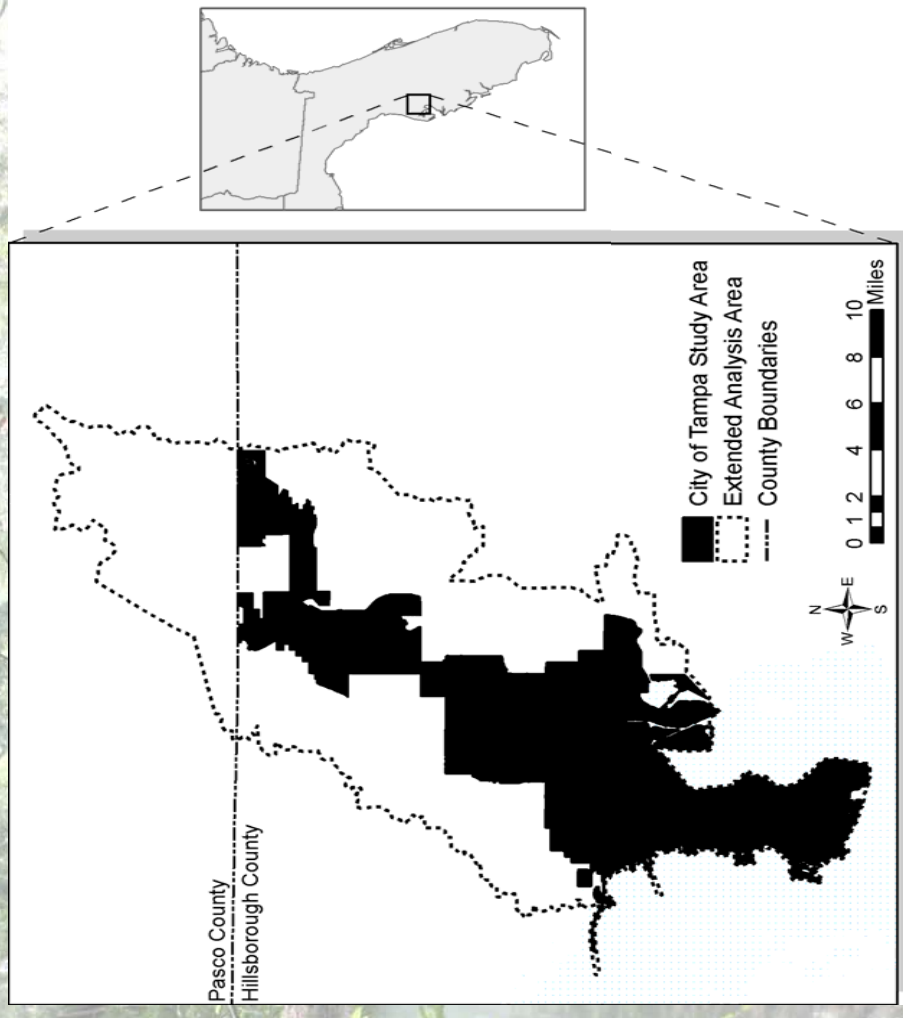
Project Objectives for the Ecological Analysis of the Urban Forest

- Quantify the change in tree cover since 1996
- Use high-resolution techniques to create a new benchmark for existing tree canopy cover
- Complete an updated & more thorough ecological analysis
- Assess the ecological health
- Estimate the ecological and economic benefits



Part One: Remote Sensing

- Tree Canopy Temporal Change
 - Quantify the change in tree cover since 1996
- High-Resolution Tree Canopy Cover Assessment
 - Use high-resolution techniques to create a new benchmark for existing tree canopy cover

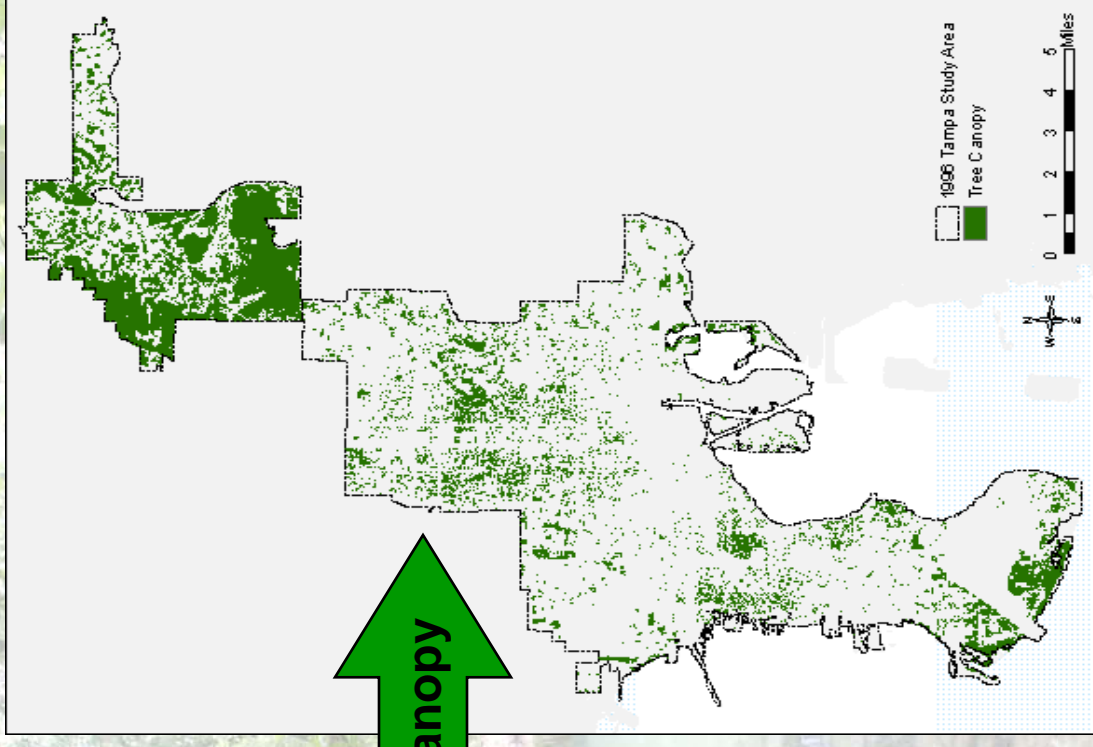


Tree Cover Change Analysis Methods

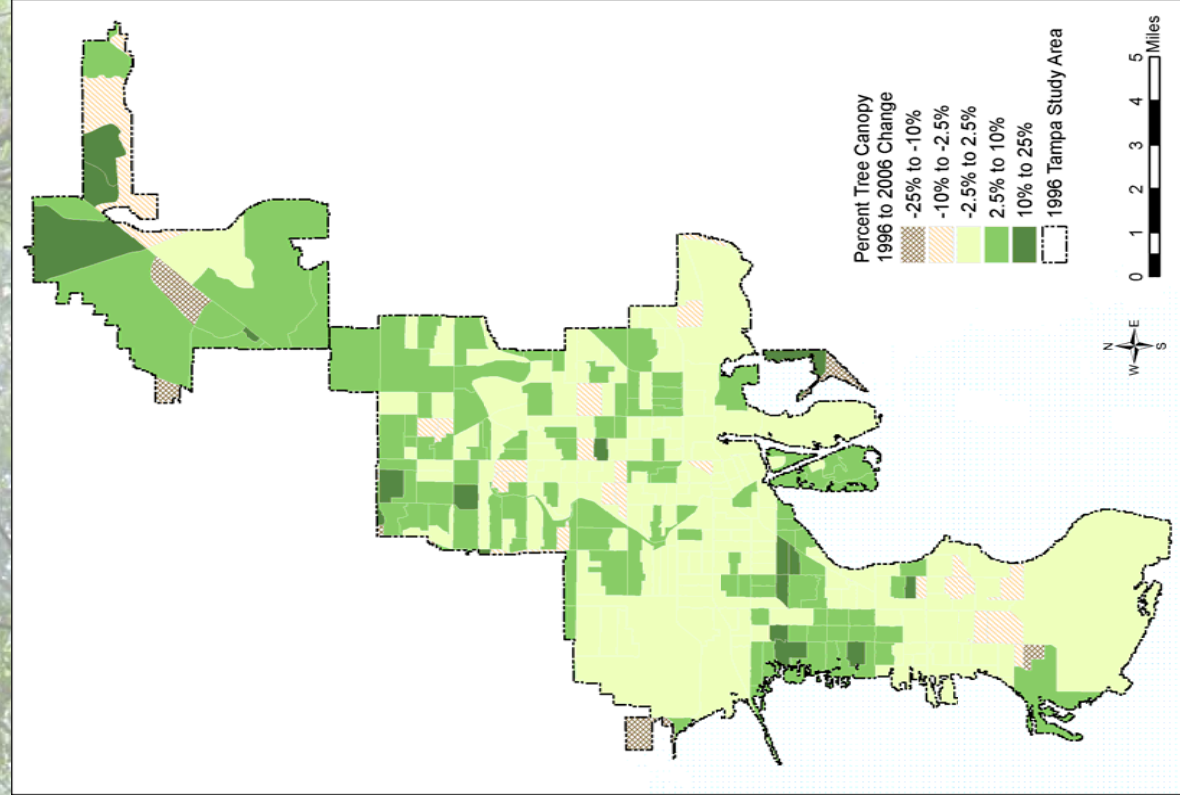
- Same methods as previous study for consistency
 - Landsat TM, 30 meter resolution
 - Classified using NDVI
 - vegetation index as Canopy/No Canopy
- Conservative estimate
 - 75% canopy cover in 30 meter area required to be labeled “canopy”



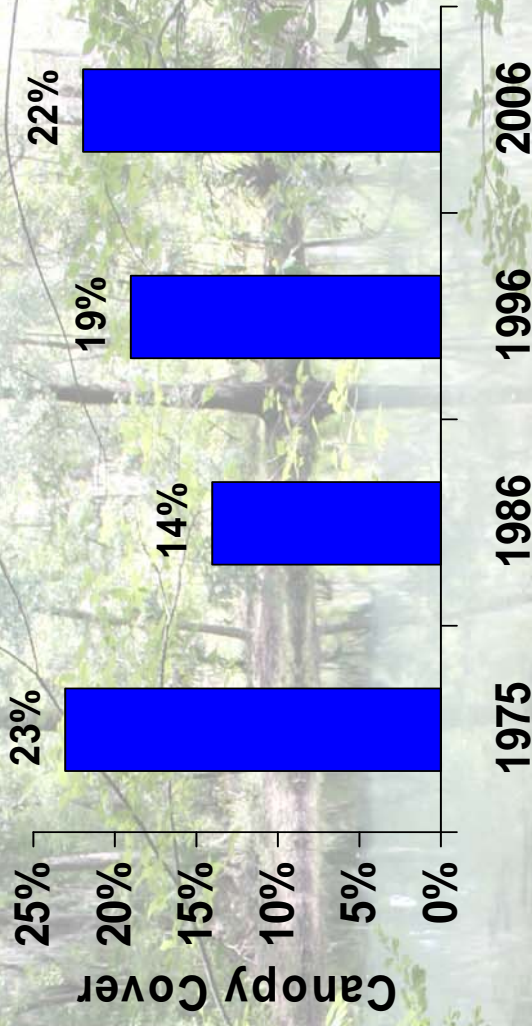
Tree Cover Change Analysis Methods



1975 - 2006 Tree Cover Change Analysis Results



Change Detection Using Medium Resolution Imagery



- Citywide increase in tree cover and return to 1970's citywide tree cover
- Some areas lost tree cover
- Reasons for change are not known

Establishing a New Benchmark: 2006 Tree Canopy Cover Assessment



- Methods more robust
 - 900x greater spatial resolution
 - More complete land cover classification
- 95.6% accuracy
- Individual trees detected
- Parcel-level analysis possible
- This is part of a new benchmark for future studies

900x Greater Spatial Resolution



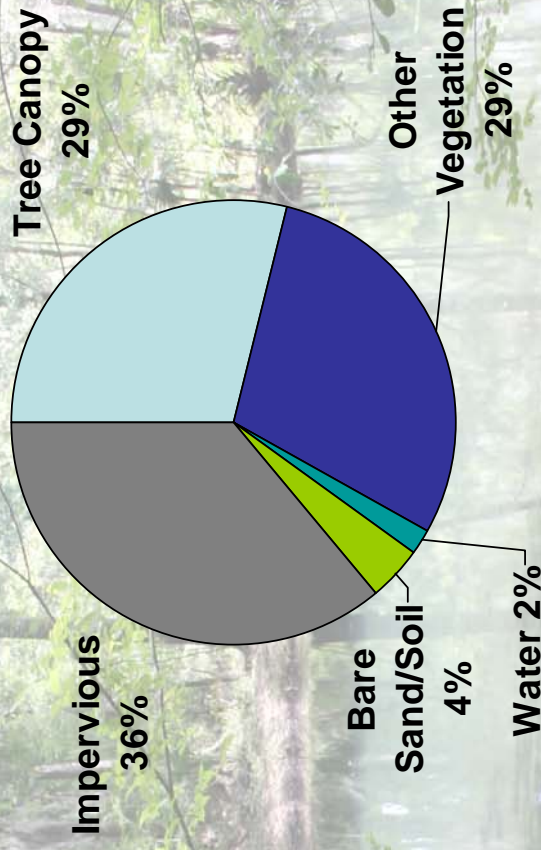
2006 Landsat TM – 30 meter



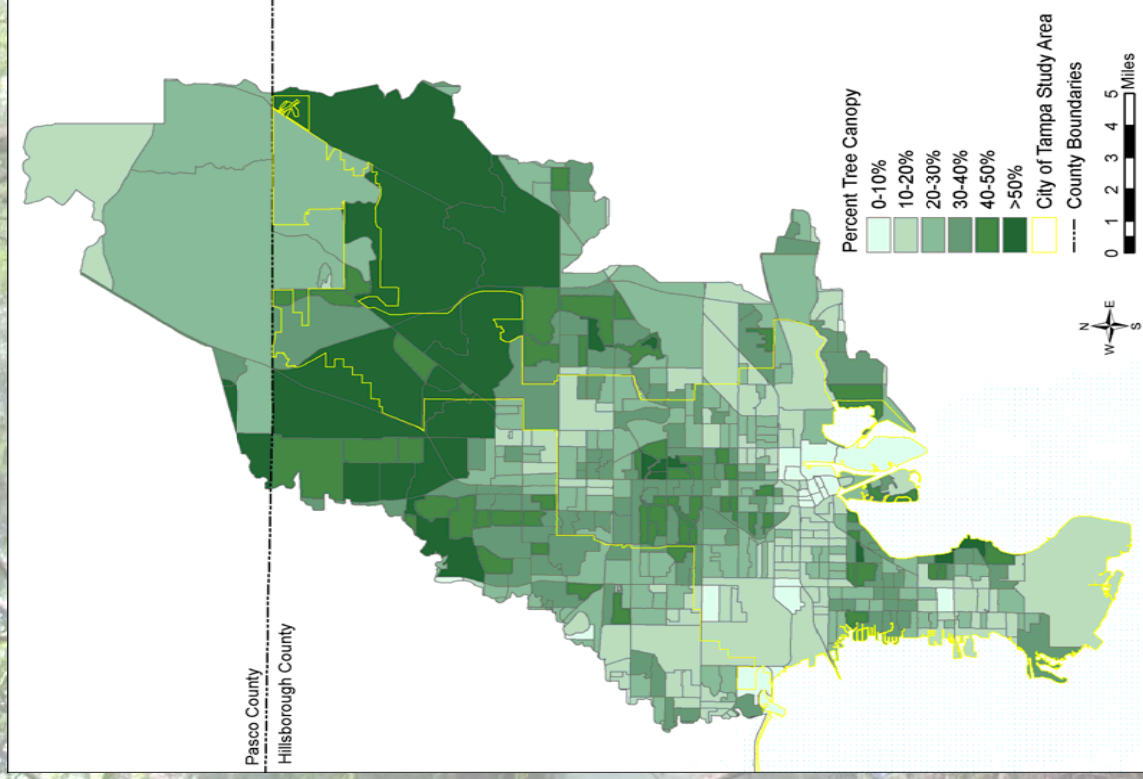
2006 IKONOS – 1 meter

2006 Tree Canopy Cover Results

City of Tampa 2006 Land Cover



- 58% total vegetation cover: trees and other vegetation, including lawns



Tree Canopy and Other Vegetation Cover by Land Use

Land Use Category	%Tree Canopy	% Other Vegetation
Agricultural	21%	72%
Commercial	18%	13%
Industrial	11%	19%
Public/Quasi-Public / Institutions	28%	37%
Public Communications / Utilities	84%	7%
Recreational / Open Space	31%	52%
Residential (Total)	38%	22%
Right of Way / Transportation	19%	25%
Unknown	12%	13%
Vacant	32%	40%
Water	6%	4%
Citywide Total	29%	29%

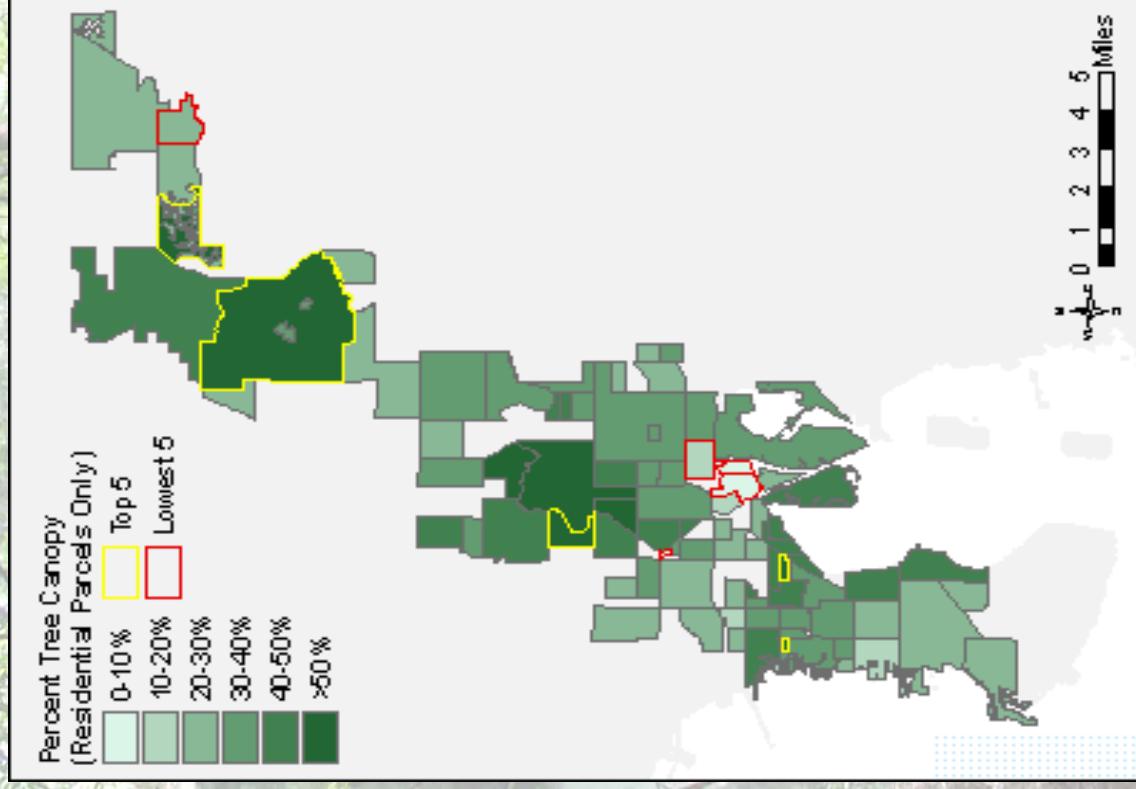
City of Tampa Tree Cover Compared to Surrounding Watersheds

- Lower tree cover for some land uses:
 - 10% lower overall tree cover (29% vs 39%)
 - 4% lower on urban/built-up land uses (23% vs 27%)
 - 13% lower on medium density residential* (30% vs 43%)
- Similar or higher tree cover for other land uses:
 - Similar tree cover on industrial lands
 - 7% higher on high density residential* (33% vs. 26%)
 - 2% higher on recreational lands

* Residential densities are generally 2-5 units/acre for medium and >5 units/acre for high.



2006 Tree Cover by Neighborhood (Residential Areas)



- Neighborhoods with low tree cover did not necessarily have low total vegetation
- Top 5 for Residential Tree Canopy (Yellow):
 - Tampa Palms
 - Hunters Green Community
 - Culbreath Bayou
 - Riverbend
 - New Suburb Beautiful
- Lowest 5 for Residential Tree Canopy (Red):
 - Historic Ybor
 - Tampa Downtown Partnership
 - The Marina Club Of Tampa
 - Channel District
 - Cory Lake Isles
- Neighborhood tree cover is different when commercial and other land uses are included

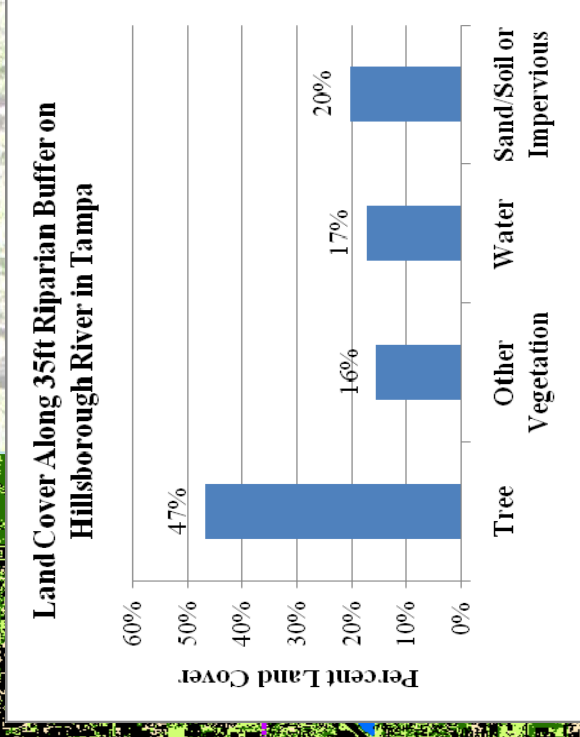
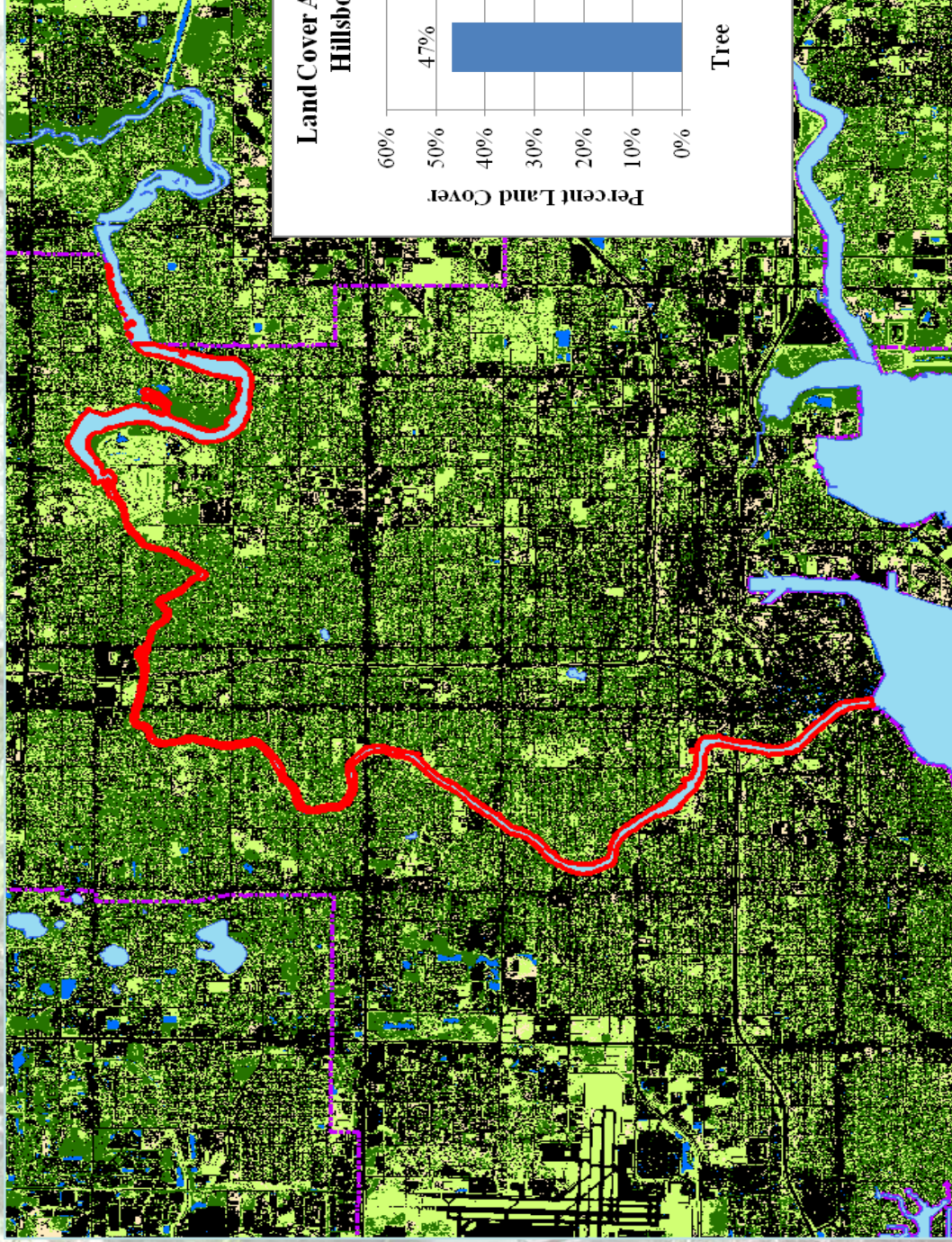


Example Application: Targeted Street Tree Planting

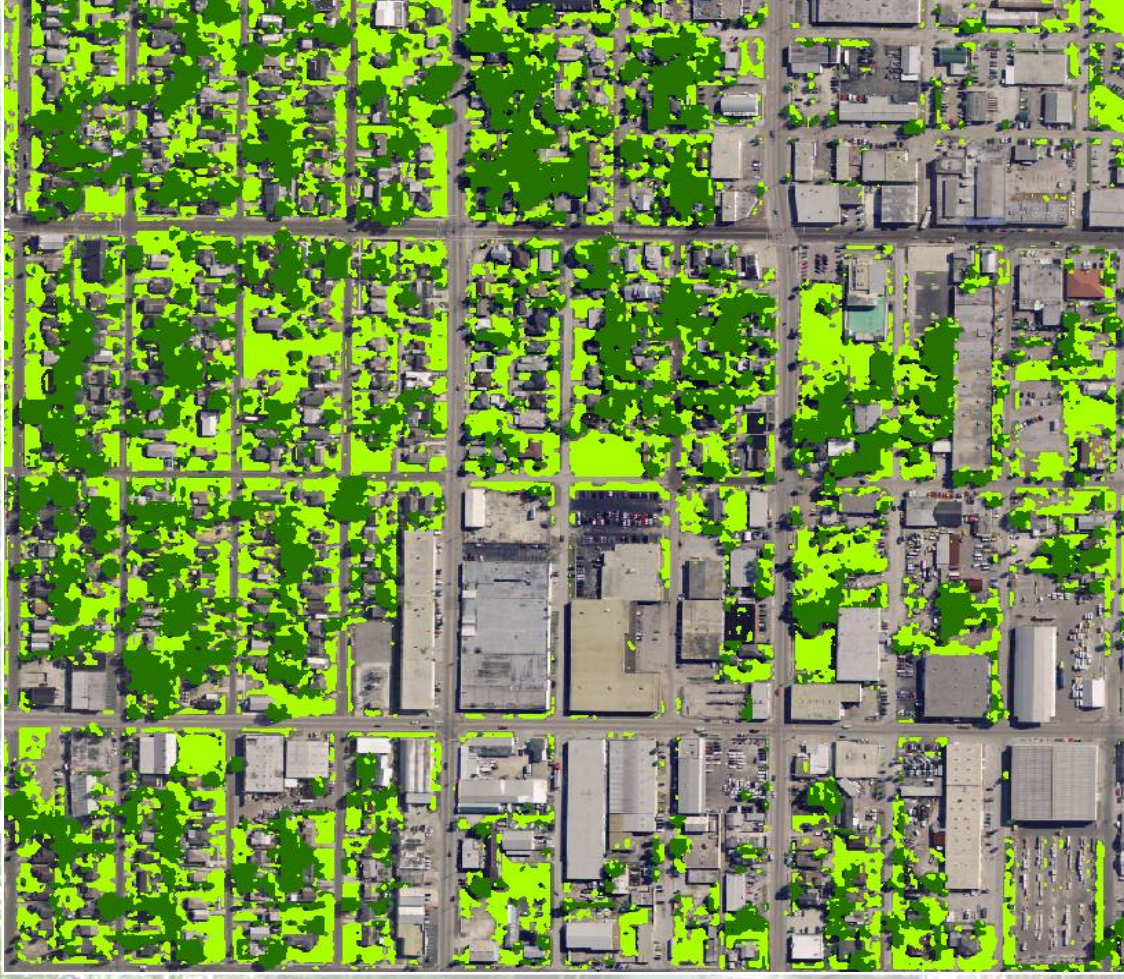
- ROW locations with available planting areas but lacking



Example Application: Tree cover on Riparian Buffers



Tree Canopy Cover is Only Part of the Story



- View from above can show the heterogeneity of land cover
- Tree cover is an indicator of the spatial distribution of other benefits/costs
- But, an ecological analysis must also consider structure, composition and function

Part Two: Ecological Analysis

- Complete an updated & more thorough ecological analysis
- Assess the ecological health
- Estimate the ecological and economic benefits



First Phase



**This is the most scientifically robust system available in the world today to describe the urban forest:
Structure, Composition & Function**

04.15.2007 21:18



37.2 ft. radius
plots





- Plots captured ground based information such as:

- Ground cover
- Shrub cover & composition
- Individual tree measures:
 - Diameter
 - Height
 - Crown Area
 - Crown Condition

- Information describes the forest at the level where we work and live.



Results - Canopy Cover

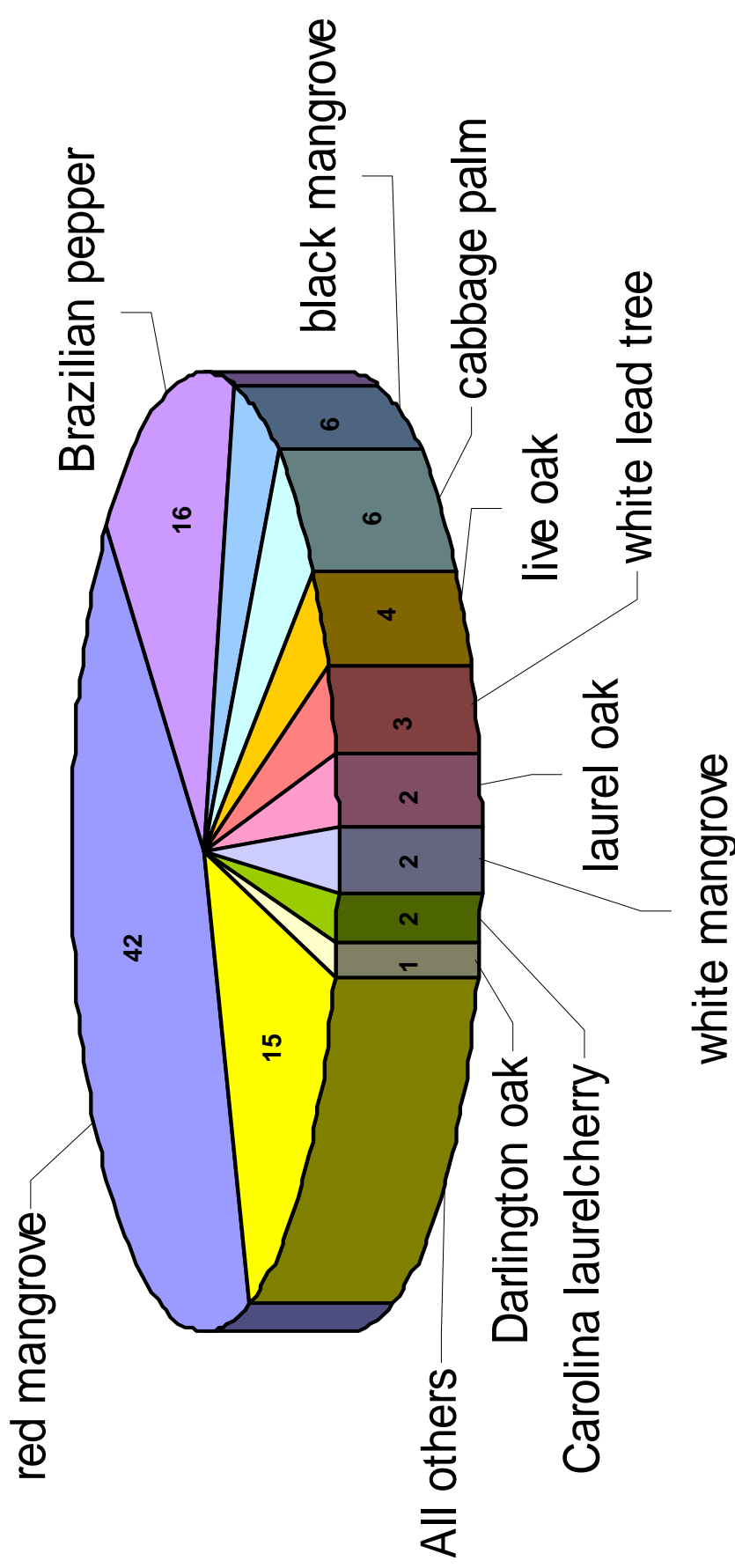
- Two independent methods for measuring the aerial extent of the urban forest....

- USF analysis = 29.0%
- UF - UFORE = 28.1%



Total Number of Trees: >7.8 million

Compensatory value: ~\$1.4 billion

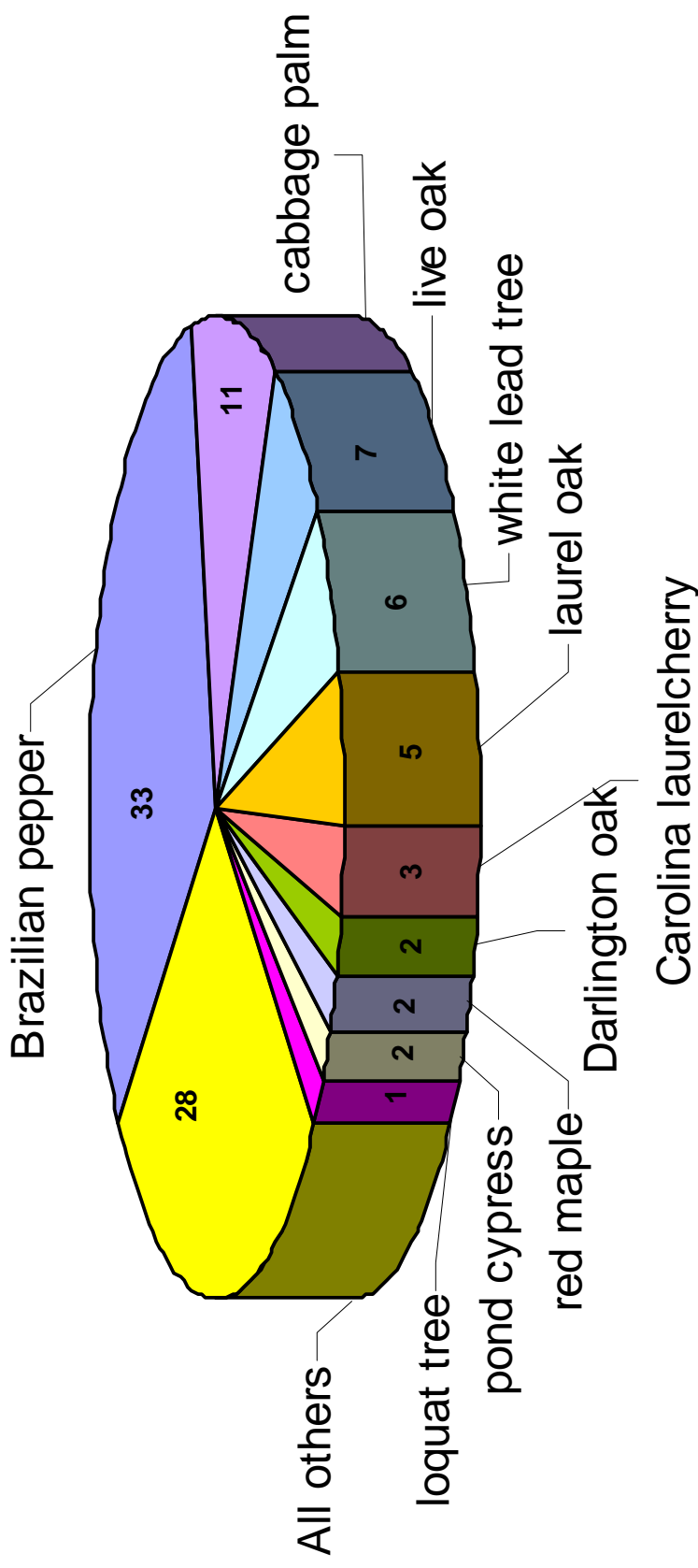


Tree = woody stem > 1 inch
diameter at breast height



Total Number of Trees: ~3.9 million

Compensatory value: ~\$1.2 billion



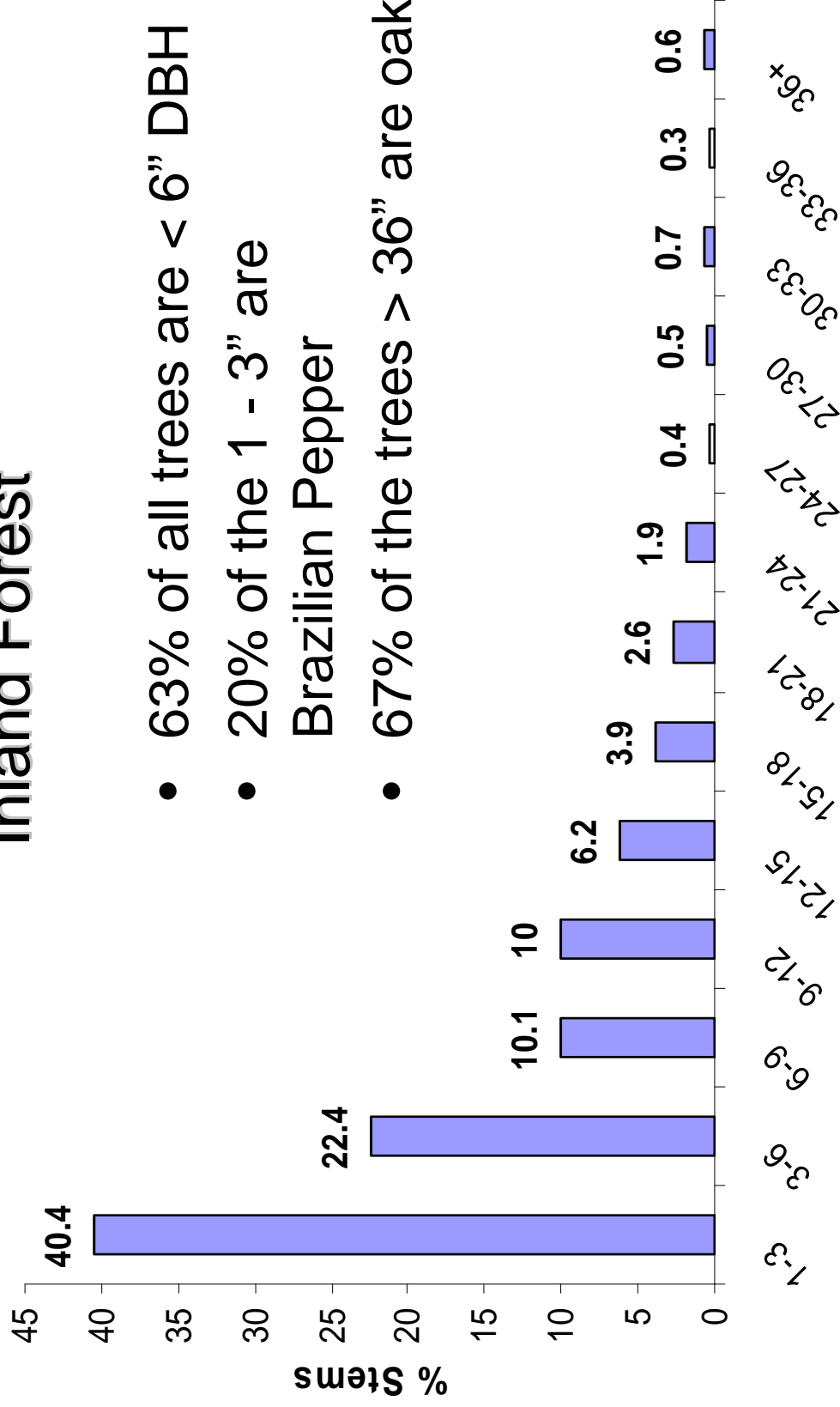
Tree = woody stem > 1 inch
diameter at breast height



Diameter Distribution

Inland Forest

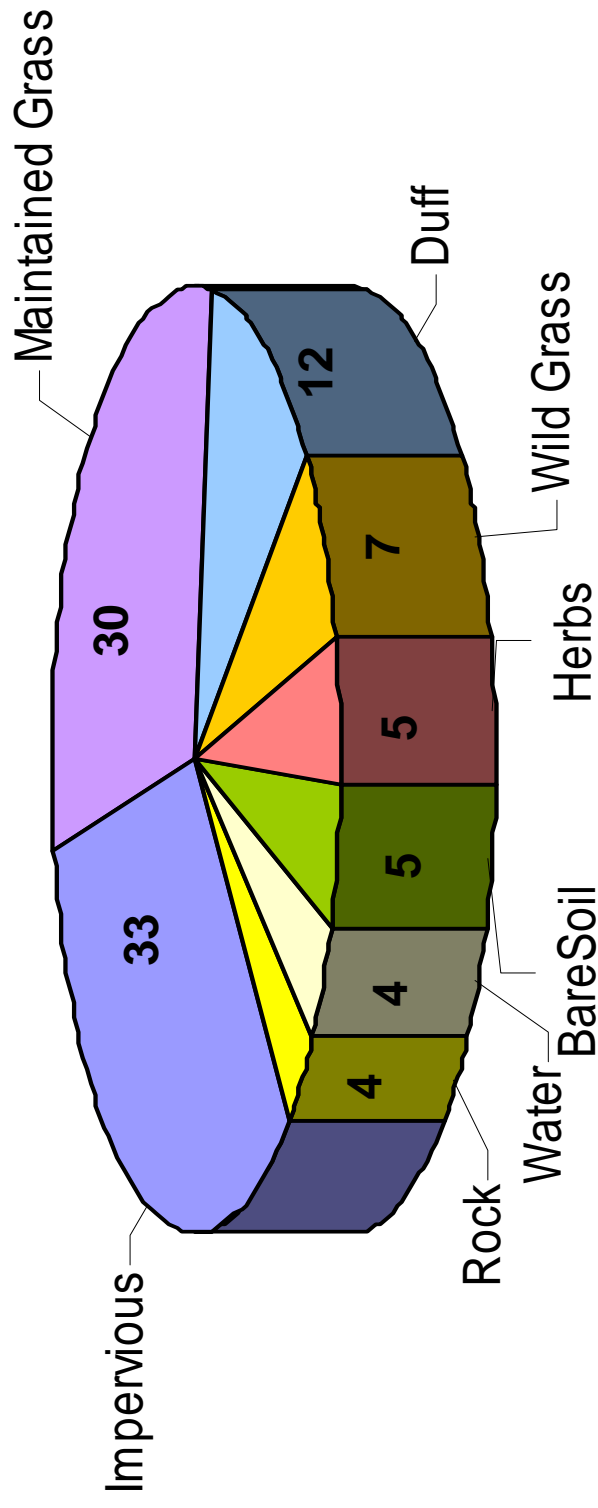
- 63% of all trees are < 6" DBH
- 20% of the 1 - 3" are Brazilian Pepper
- 67% of the trees > 36" are oak



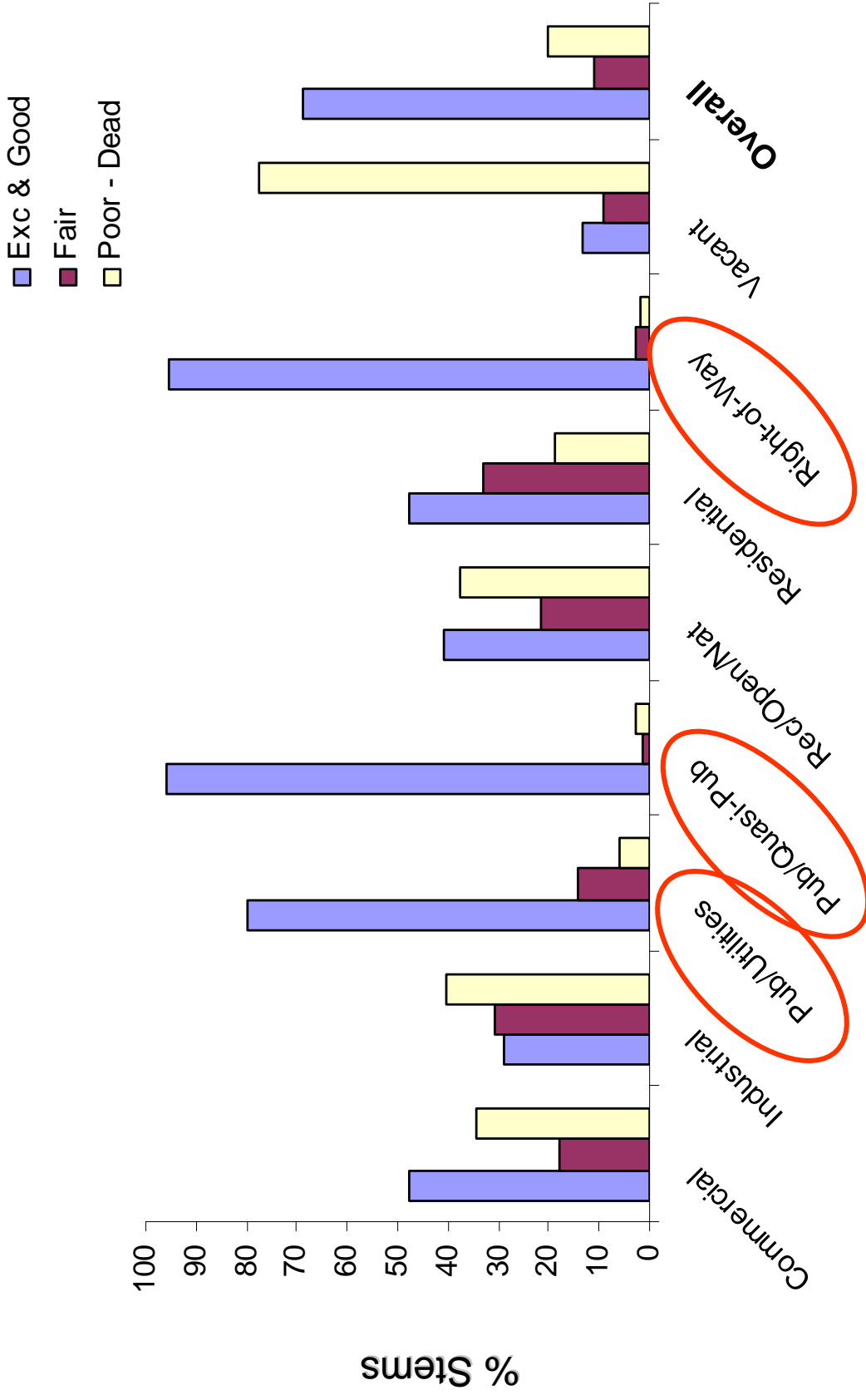
DBH Class (in.)



Ground Cover - Study Area

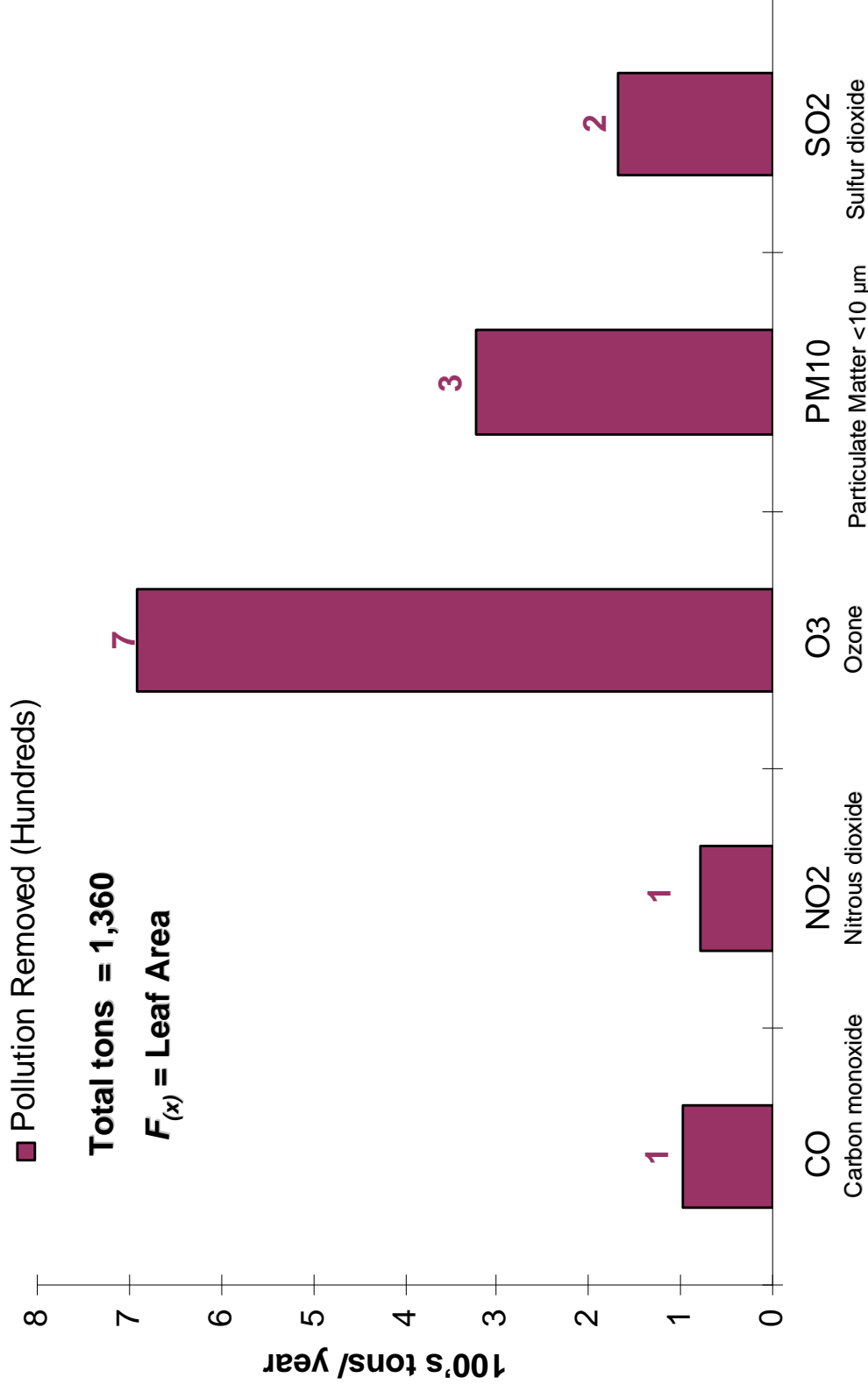


Tree Health by Land Use



2007 - Pollution Removal

1 yr value = \$6.3 million*



* Based upon median externality values

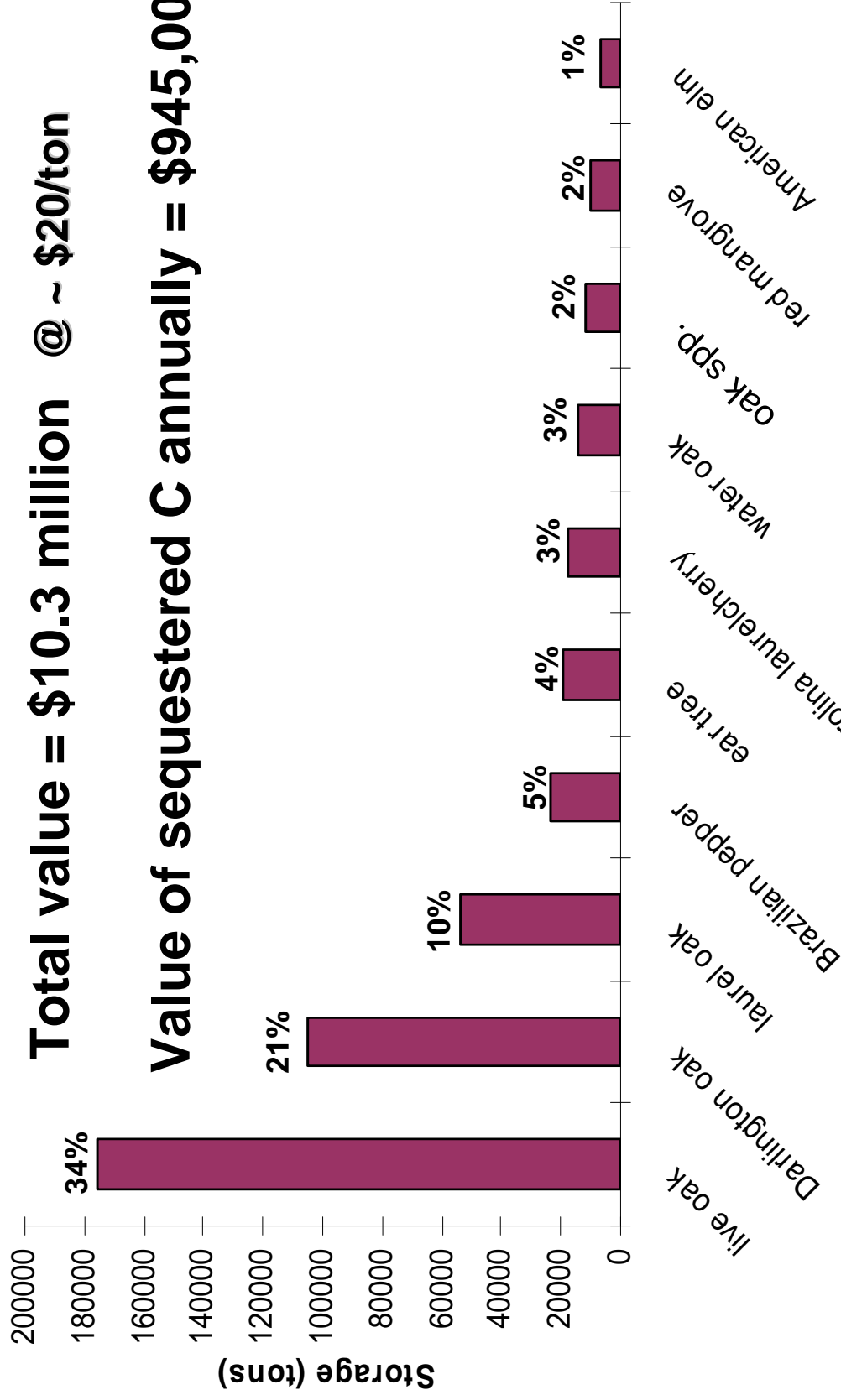


Current Carbon Storage

Relative \$ Contribution

Total value = \$10.3 million @ ~ \$20/ton

Value of sequestered C annually = \$945,000



Residential Energy Conservation

2007

	Heating	Cooling	Total
Energy Conserved			
MBtu ^a	2,994	n/a	2,994
MWh ^b	106	34,637	34,743
Carbon avoided	68	6,117	6,185

^a Million British Thermal Unit
^b Megawatt-hour

Total ~\$4.2 Million



Urban Forestry Research Indicates

- Urban forest structure affects:
 - Storm water flow & water quality
 - Human health
 - Property values
 - Reduction in violent crime
 - Economics of retail businesses
 - Traffic Calming
 - Biodiversity and habitat



Next Steps

**Complete analysis of the 300 plots in the
urbanizing forest area in the watershed
surrounding Tampa**

Summer 2008

**Strategies for the sustainability of
Tampa's urban forest**

Summer 2008





City of Tampa Mayor's Symposium on Community Trees and the Urban Forest

Thursday, June 19, 2008
9 AM – 1 PM
Tampa Convention Center
333 S. Franklin Street, Tampa, FL

Mayor's Symposium Open Forum Responses

Group 1:

1. Storm water credits for tree preservation (research \$\$)
2. Require more trees for parking lots
3. Best management practices for controlling/ eradicating Brazilian Pepper
4. Bring back city nurseries
5. Better coordination between different planning agencies. Introduce policies to encourage tree preservation.
6. Respect landowner's rights (i.e. taxpayer rights)
7. Teco sponsored education brochures for proper residential planting
8. Exotic invasive species, educate the public and private organizations
9. Retention of existing vegetation for new construction
10. Protection of key watershed areas in Hillsborough County and city
11. Increase diversity of vegetation offered for plantings ordinance
12. Increase roadway planting budget
13. Emphasize economic benefit of tree cover. PR campaign because of canopy potential
14. Solve utility conflicts in the right of way. (HWRA study)
15. Educate the public regarding right vegetation in the right location.
16. Storm hardy tree species
17. Management goal of 10% impervious grounds
18. Strategize to out-compete invasive species with other species

Group 2:

1. Develop educational/ public awareness campaign promotion the benefits of healthy, sustainable urban forests. Public schools (elementary – high school), include the report summary
2. Emphasize importance of proper maintenance and selection of species in right-of-way street tree plantings.
3. Consider new incentives for private land developers to encourage preservation of existing trees and planting of new trees (i.e. reduction of permitting and/or impact fees based on amount of urban forest cover on the development site.)
4. Maintain municipal/urban forester on city staff- by ordinance
5. Develop program to “buy-back” tree parking lot islands and excess impervious area that are too large for current land uses. (i.e. tampa greyhound track, florida mall, k-mart plaza at florida avenue and waters avenue)
6. Reduce heat island effect through improved site development codes, incentives, cost/benefit analysis

Group 3:

1. Movement from single tree management (policy) to urban forest policy
2. Diversification of urban forest species
3. Funding for planting public and maintenance of trees
4. More protection measures for preserving trees within development (better enforcement)
5. Encourage planting trees within heavily urbanized areas (street and parking lots) through tax incentives or regulation
6. Educate public that their trees are part of the urban forest (benefits)
7. Preservation of more natural habitat/ecosystem by land acquisition and or regulation
8. streamline process ease or facilitate the removal of invasive exotic species
9. Create mitigation credit or other incentive for the removal of invasive plant species.
10. Larger tree (technical standards) islands for parking lots
11. Tree advisory board and Public Relation city wide stake holder representative
12. Research into size and quality saving large trees vs. planting smaller ones
13. Trees ----- green infrastructure

Group 4:

1. Importance of shade
2. Incentive program for invasive removal
3. Negative implication of mangrove regulation
4. Trees at schools, educate kids of benefits of trees
5. Vegetative buffer along waterways
6. Life cycle cost of tree management
7. Trees near airports
8. Diversity of species of trees
9. Invasive species – development removal
10. Planting trees does not hinder lawn maintenance
11. Marketing the value of public spaces that currently exist (i.e. Picnic Island, MB Nature Park)
12. Benefit of 1 large tree vs. ## of smaller trees – current regulation prohibitive?

Group 5:

1. Replacement / removal program – Permitting, right tree/ right place- permitting and education recognition of small neighborhood tree efforts
2. Species Diversity- establish guidelines public education of importance
3. Re-development and new development of stricter removal rules and replacement strategy for exotic/ invasive removal program fore private individuals- replacement after removal
4. Code enforcement, lack of proper care of all trees/ improper care/ pruning
5. Protection from construction
6. Detection and mitigation strategy for exotic /invasive plants and animals
7. Partnerships with all organizations to make decisions

Group 6:**Group 7:**

1. Registration and licensure of arbor culturist

2. Educate the public
3. Develop exotic removal plan
4. Increase diversity in planting requirements,
5. Educate utility companies
6. Designate canopy streets or neighborhoods
7. Transportation planning
8. Maintain urban forest in most sustainable manner (i.e. diversity)
9. Plant more trees
10. Base replant requirements on canopy not stems

Group 8:

1. Lack of education of specific tree and plant characteristics and requirements in residential areas that in the long-term the growth of these trees will create future infrastructure issues and harm to the tree itself.
2. A stream-lined funding policy to aid residents in replacing the trees that were asked to be removed due to code or natural disasters to preserve the experience and atmosphere of the area
3. Too many resource and energy used to maintain vast lawn that have little beneficial value to citizens compared to urban trees a more flexible policy for alternatives.
4. Engaging, empowering, educating citizens, interest groups and neighborhoods by the government as the solution
5. Lack of knowledge in the public of the benefits of the urban canopy in clean environment (phytoremediation, carbon uptake) residential value and cooling benefits and lack of educating children from the beginning of the value of urban forest with environment and biodiversity.

Group 9:

1. Right plant- right place; damaged sidewalks and road surfaces
2. Proper pruning/ maintenance establishment – Teco
3. Water maintenance, i.e. reclaimed water
4. Climate change need more vegetation
5. Exotic species removal
6. Better way to identify grand trees i.e. oaks
7. Identify trees in decline for tree replacement
8. Proper training/ education i.e. master gardener program- Hillsborough County extension,
9. Age appropriate education
10. Smaller shade trees at bus stops
11. Urban forester for city of Tampa

Group 10:

1. Provision for green roofs in land use categories
2. Increase inches threshold for grand trees (32” to 28”)
3. Provision to ensure the areas are suitable for success of plantings
4. Increase distribution of the types of land uses with canopy
5. Ensure proper aeration of the root zone
6. Public/Private partnership for installation and maintenance
7. Integrate the hydrology study for flooding concerns and cost of improvements
8. Land development code – incentives for green roofs and plantings (ex. Reducing fees

9. Promote innovative construction methods that avoid impacting current canopy
10. Reduce the conflict with utilities at ground and above – policy
11. Educate, educate, educate, everyone
12. Utilize CDBG funds/ Green CDBG fund (next year) – provide mini-grants for youth plantings and neighborhood groups
13. Build in more opportunities for LEED programs
14. Promote and insure diversity of tree species
15. Create a program to eliminate Brazilian pepper from public
16. Connection between the UFORE study and Carbon foot-print information

Group 11:

1. Updating ordinance to address relationships tree health, parking lots design, signage
2. Require licensure of tree service companies and CEU's
3. Incentives for maintaining required and existing trees and landscape
4. Make watershed preservation a higher priority within the city limits- pursue funding for acquisition and improvements
5. Increase communities value of trees
6. Increase dbh inches of trees in the city
7. Concern for loss of tree canopy along Hillsborough river
8. Need to educate community of study
9. Increase penalties for removal of protected trees
10. Loss of canopy due to extreme utility maintenance

Group 12:

1. How to balance private property owner's rights with city's urban forest management
2. More public education (citizens, leaders) on tree values (especially low-income areas)
3. Need to have partnerships with all agencies to have similar goals and thus similar management policies within the city and state
4. Incentives for landowners to maintain green spaces and pervious surfaces
5. Encourage alternatives to maintained grass
6. Change view of urban forestry, as a luxury to a necessity
7. Look at the long term growth habits of tree species we want to plant
8. Funding (lack of and how its used) e.g. replacing trees with sod – right of ways
9. Increase species diversity (in plantings)
10. Why is city protecting camphor tree? – Do we use the resource to remove non-natives or do we use them to plant natives in plantable spaces?

Group 13:

Group 14:

Group 15:

Group 16:

1. Incentives
2. Mitigation- plant species/ permits +8

3. Govern Tree replacement Program 4+6
4. Education of public funding forest
5. Government departments communicating among themselves
6. Community involvement
7. Pro-active tree planting
8. Utilized certified/trained employees within capacity



CITY OF TAMPA

Pam Iorio, Mayor

Parks and Recreation Department

Karen Palus, Director

September 4, 2008

<committee member>

Thank you very much for agreeing to be a member of the **Mayor's Steering Committee on Urban Forest Sustainability**. As outlined in my invitation letter, you will be charged with the development of a vision statement, goals and implementable strategies to guide urban forestry policy and management efforts within the City of Tampa in a manner that supports the Tampa Comprehensive Plan – Building Our Legacy A Livable City. Because your time is extremely valuable, the Steering Committee will persist only for the length of time required to complete this charge. The strategies you develop will then be used by the City of Tampa's Parks and Recreation Department to programmatically address urban forest sustainability.

I am confident you will be able to complete these efforts no later than January of next year. You will be assisted by a team of professionals from the University of Florida, University of South Florida and Hillsborough County Extension who will guide you through a well organized, stepwise and very focused planning process. They will facilitate the meeting, provide you with appropriate preparation materials and be available to answer your questions, but the decision making responsibility is yours and that of the other committee members. The success of the Steering Committee will require the efficient use of everyone's time and I ask that you come prepared and be engaged at each meeting.

All meetings will be held at the Hunt Community Center, located within Al Lopez Park at 4810 North Himes Ave. in Tampa. Please contact my office if you need directions. The date and topic for each meeting is as follows:

- September 16, 4-6:00 PM: Creating a Vision for Tampa's Urban Forest
- October 21, 4-6:00 PM: Developing Goals to support the Vision
- November 18, 4-6:00 PM: Establishing general Strategies that support the Goals
- January (if necessary): Completion of work efforts

Attached to this letter you will find 1) draft agendas for each of the first three meetings, 2) a copy of the *City of Tampa Urban Ecological Analysis 2006-2007* report, and 3) a copy of *The Benefits of Urban Trees*, a literature summary. The purpose of the first meeting will be to develop a vision for Tampa's Urban Forest. This vision statement should clearly state the common dream or ideal that the Steering Committee has for the city's urban forest. The vision statement should offer unity while allowing groups to make their own unique and distinct contributions. In preparation of the first meeting on September 16th, I ask that you carefully read the summary pages and review each document.

Once again, I appreciate your willingness to participate on this important committee and look forward to seeing you on September 16th.

Sincerely,

Karen Palus, CPRP
Tampa Parks and Recreation Director

MAYOR'S STEERING COMMITTEE ON URBAN FOREST SUSTAINABILITY

SEPTEMBER 16, 2008
Hunt Community Center

Meeting Schedules

- All Meetings at the Hunt Community Center
- September 16, 4 - 6:00 PM
 - Creating a Vision for Tampa's Urban Forest
- October 21, 4 - 6:00 PM
 - Developing Goals to support the Vision
- November 18, 4 - 6:00 PM
 - Establishing general Strategies that support the Goals
- January (if necessary)
 - Completion of work efforts

Tonight's Agenda

- Connecting People to the Urban Forest – Benefits and Costs of the Urban Forest
 - Rob Northrop
- Report on Tampa's Urban Forest
 - Dr. Michael Andreu and Shawn Landry
- Creating a Vision for Tampa's Urban Forest
 - Facilitator – Terry Johnson
- Discuss Next Meeting's Agenda

Urban Forestry Research Indicates

- **Positive effects of urban forests (and trees):**
 - Climate moderation
 - Pollution reduction
 - Carbon storage
 - Energy conservation
 - Stormwater flow & water quality
 - Human health and longevity
 - Property values
 - Social cohesion
 - Reduction in violent crime
 - Economics of retail businesses
 - Traffic calming
 - Reduced driver stress
 - Biodiversity and habitat



City of Tampa

Urban Ecological Analysis 2006-2007



City of Tampa Urban Ecological Analysis 2006-2007

University of South Florida

Shawn M. Landry

Dr. Ruiliang Pu

Cheran Williams

University of Florida

Dr. Michael G. Andreu

Melissa H. Friedman

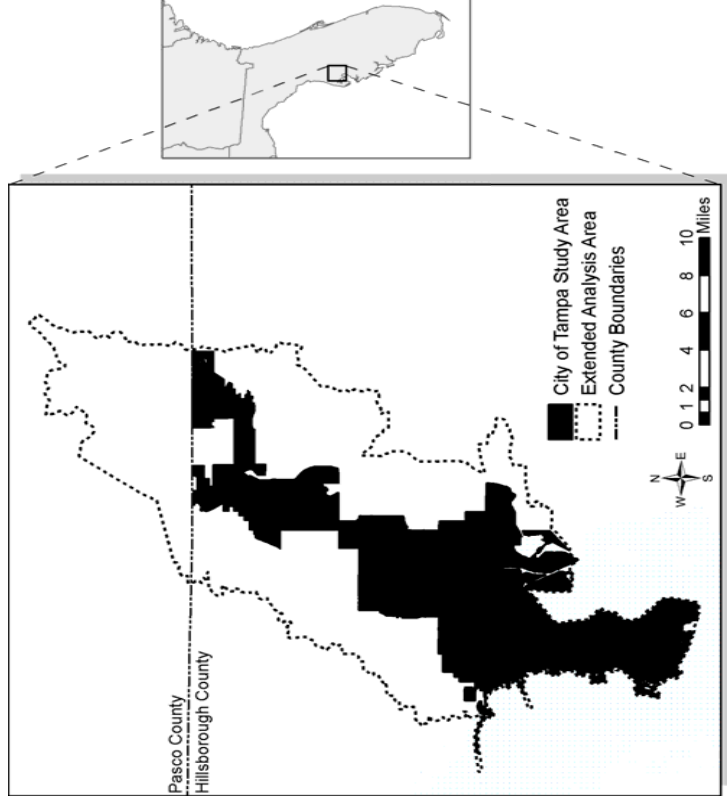
**University of Florida –
Hillsborough County
Extension**

Robert J. Northrop

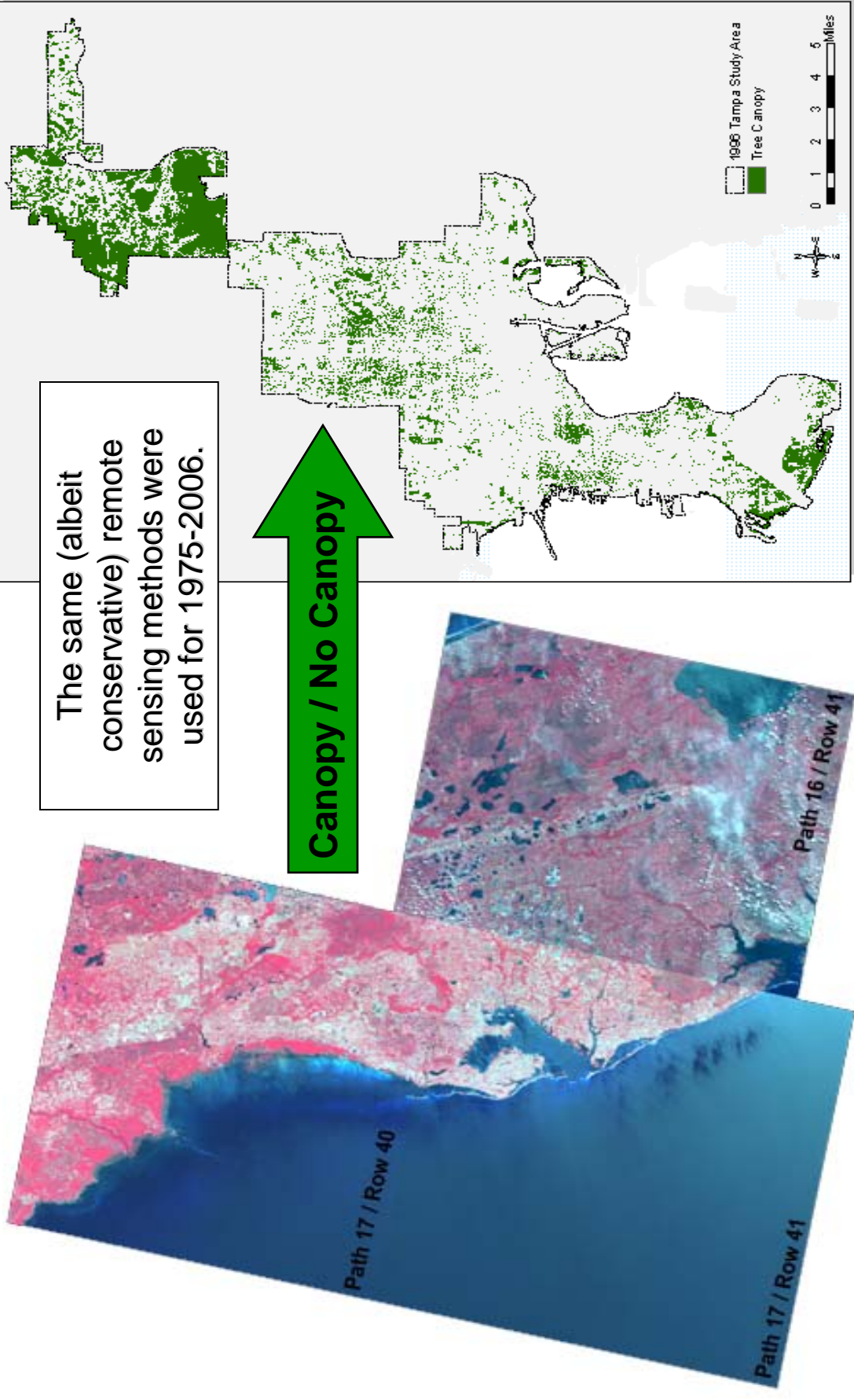


Project Objectives for the Ecological Analysis of the Urban Forest

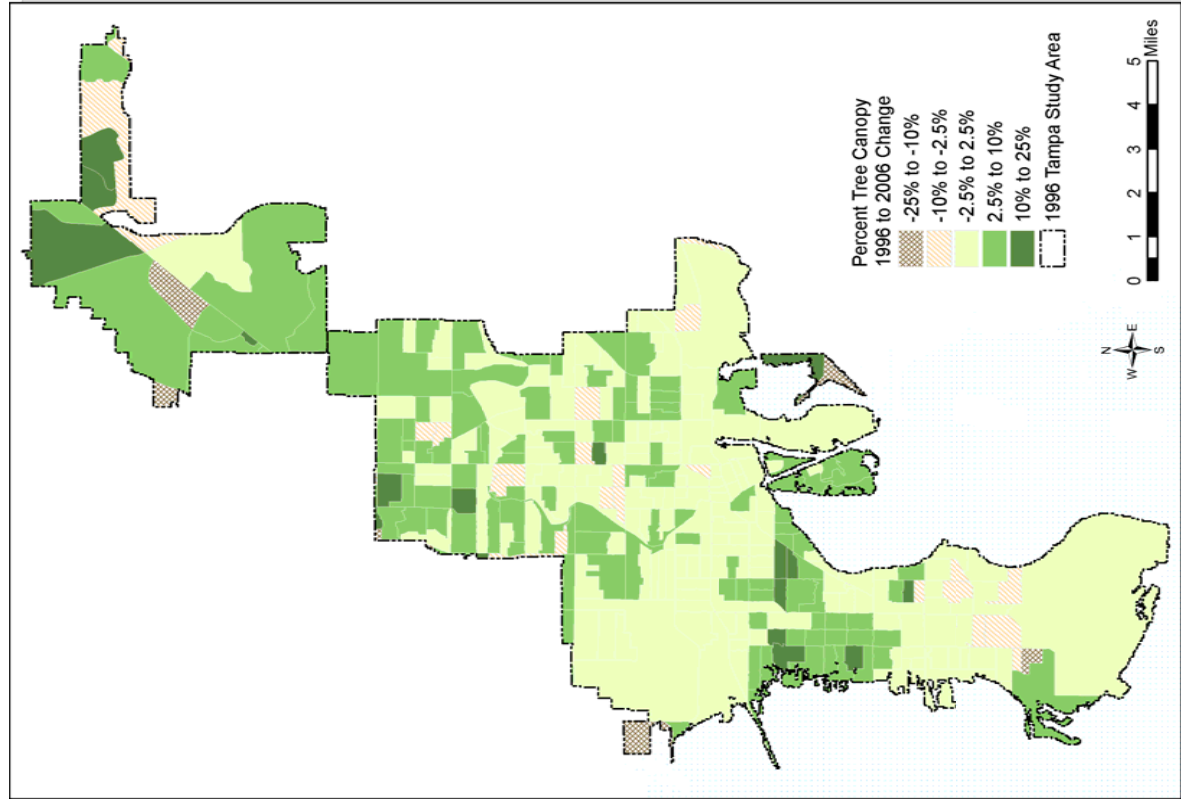
- Quantify the change in tree cover since 1975: an update of the 1996 study
- Create a new benchmark for existing tree canopy cover using the latest technology
- Complete a more thorough field-based ecological analysis
- Assess the ecological health
- Estimate the ecological and economic benefits



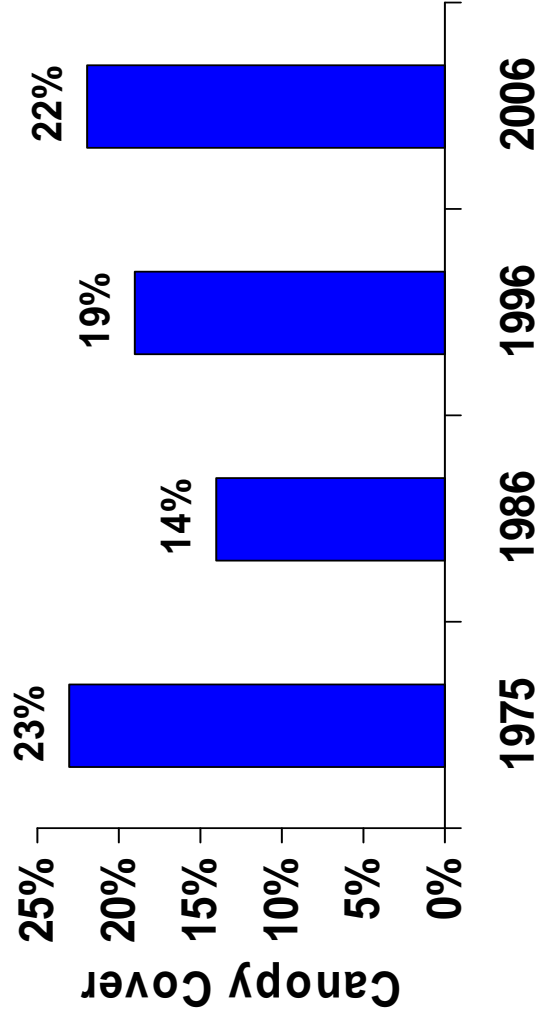
Tree Cover Change Analysis Methods



1975 - 2006 Tree Cover Change Analysis Results

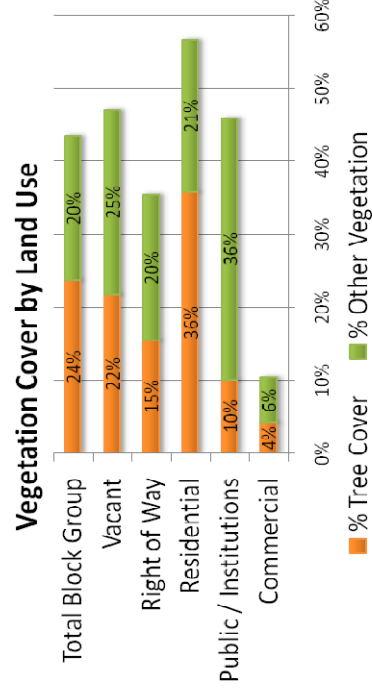


Change Detection Using Medium Resolution Imagery



- Citywide increase in tree cover and return to 1970's citywide tree cover
- Some areas lost tree cover
- Reasons for change are not known

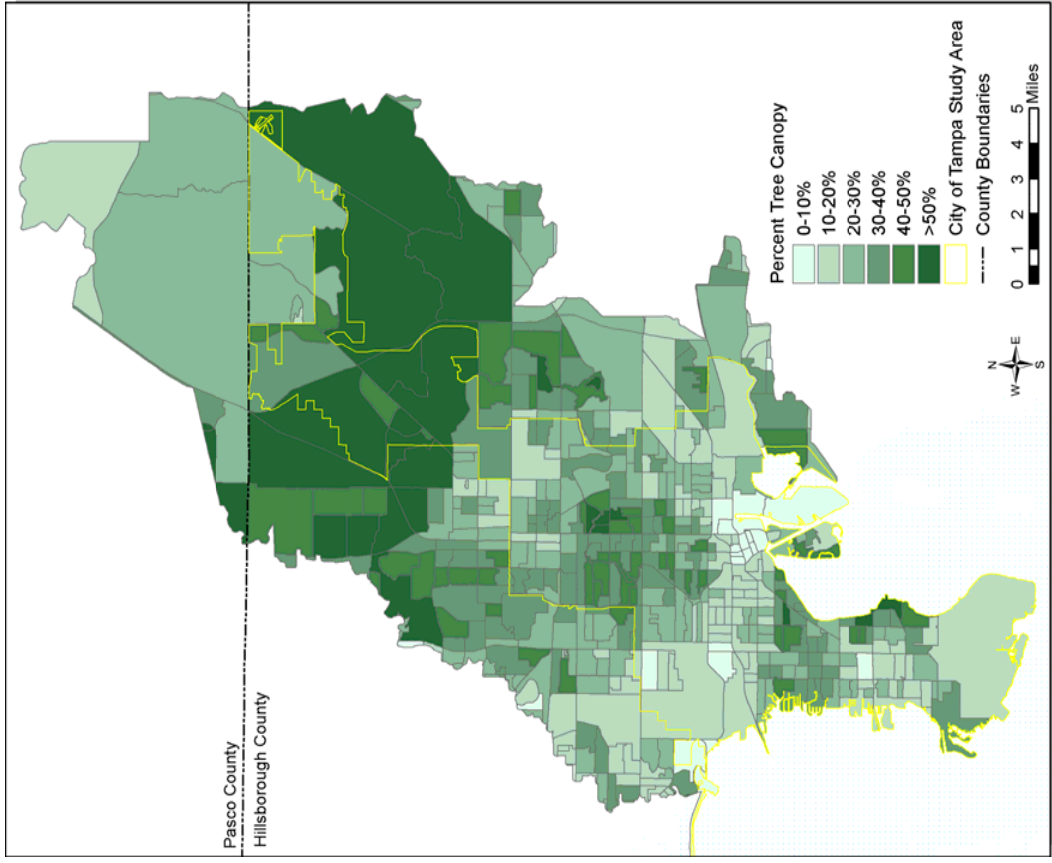
Establishing a New Benchmark: 2006 Tree Canopy Cover Assessment



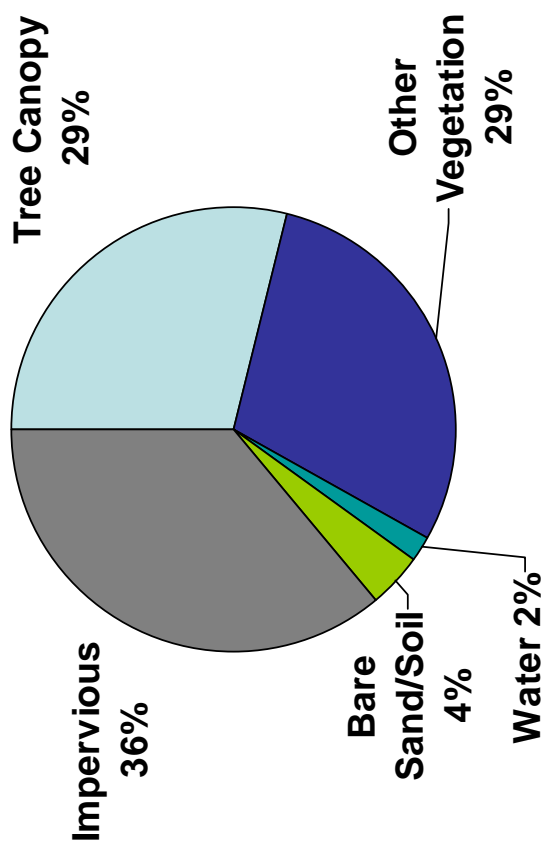
- Using the latest methods
 - 900x greater spatial resolution
 - More complete land cover classification
 - 95.6% accuracy
- Individual trees detected
- Parcel-level analysis possible
- This is part of a new benchmark for future studies



2006 Tree Canopy Cover Results

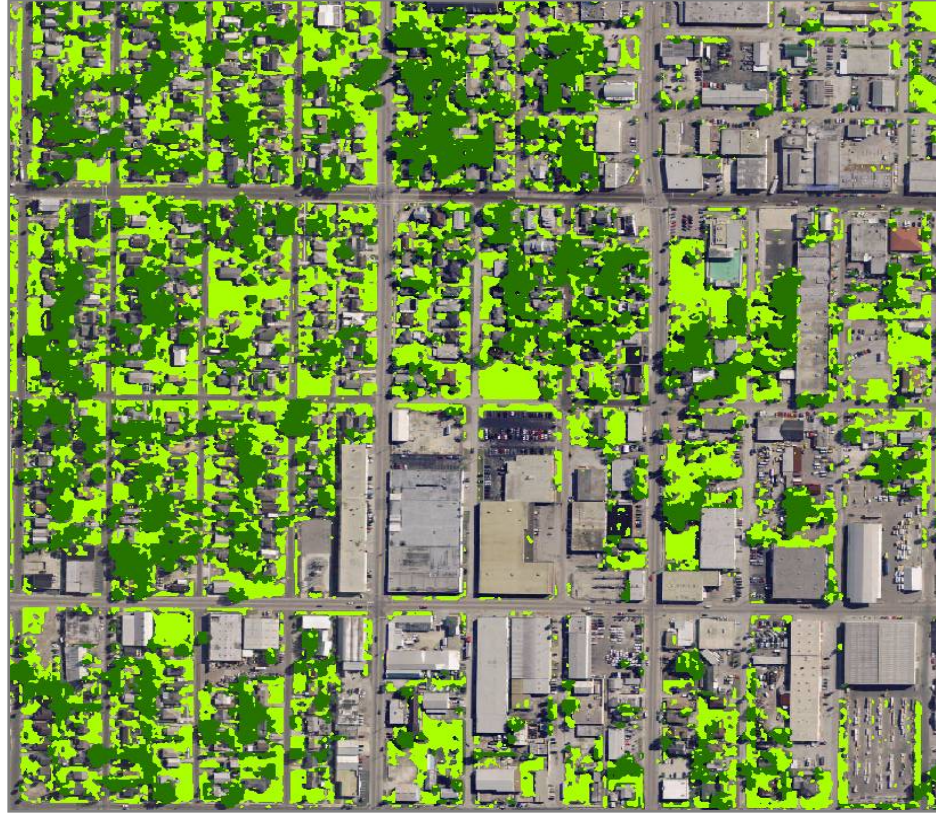


City of Tampa 2006 Land Cover



- 58% total vegetation cover: trees and other vegetation, including lawns

Making Use of Tree Cover Results

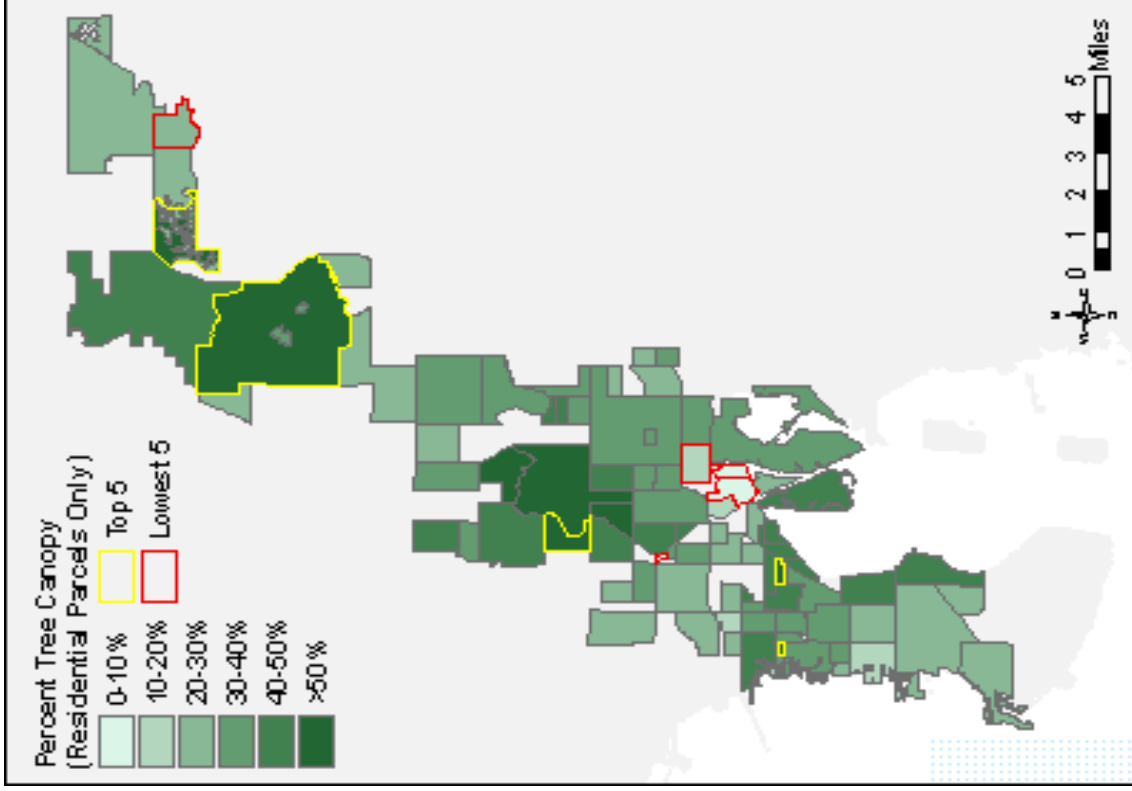


- Tree cover is an indicator of the spatial distribution of Tampa's urban forest
 - Where is the forest?
 - Do we have the "right" amount of tree cover in each neighborhood? In each land use?
 - How will planned public works project conflict with the forest?
 - Where are the available planting areas?
 - How does vegetation cover vary by household characteristics and development history?
- Remember: the urban forest is more than tree cover – We must also consider structure, composition and function (Part Two)

Applications: Vegetation Cover by Land Use

Land Use Category	%Tree Canopy	% Other Vegetation
Agricultural	21%	72%
Commercial	18%	13%
Industrial	11%	19%
Public/Quasi-Public / Institutions	28%	37%
Public Communications / Utilities	84%	7%
Recreational / Open Space	31%	52%
Residential (Total)	38%	22%
Right of Way / Transportation	19%	25%
Unknown	12%	13%
Vacant	32%	40%
Water	6%	4%
<i>Citywide Total</i>	29%	29%

Applications: Tree Cover by Neighborhood (Residential Areas)



- Top 5 for Residential Tree Canopy (**Yellow**):
 - Tampa Palms
 - Hunters Green Community
 - Culbreath Bayou
 - Riverbend
 - New Suburb Beautiful
- Lowest 5 for Residential Tree Canopy (**Red**):
 - Historic Ybor
 - Tampa Downtown Partnership
 - The Marina Club Of Tampa
 - Channel District
 - Cory Lake Isles



Applications: Targeted Street Tree Planting

ROW locations with available planting areas but lacking tree cover

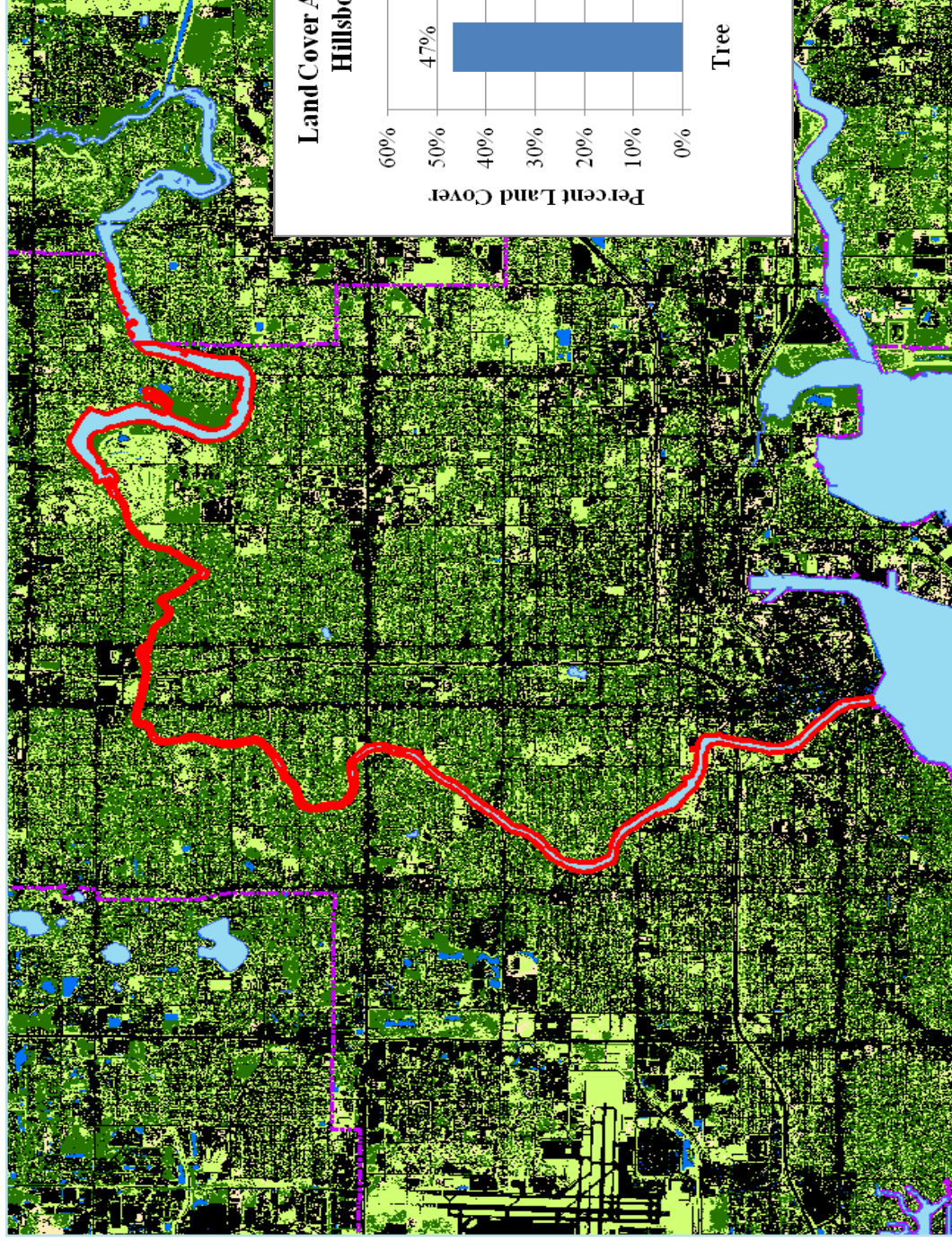


Distribution of Street Trees in Tampa



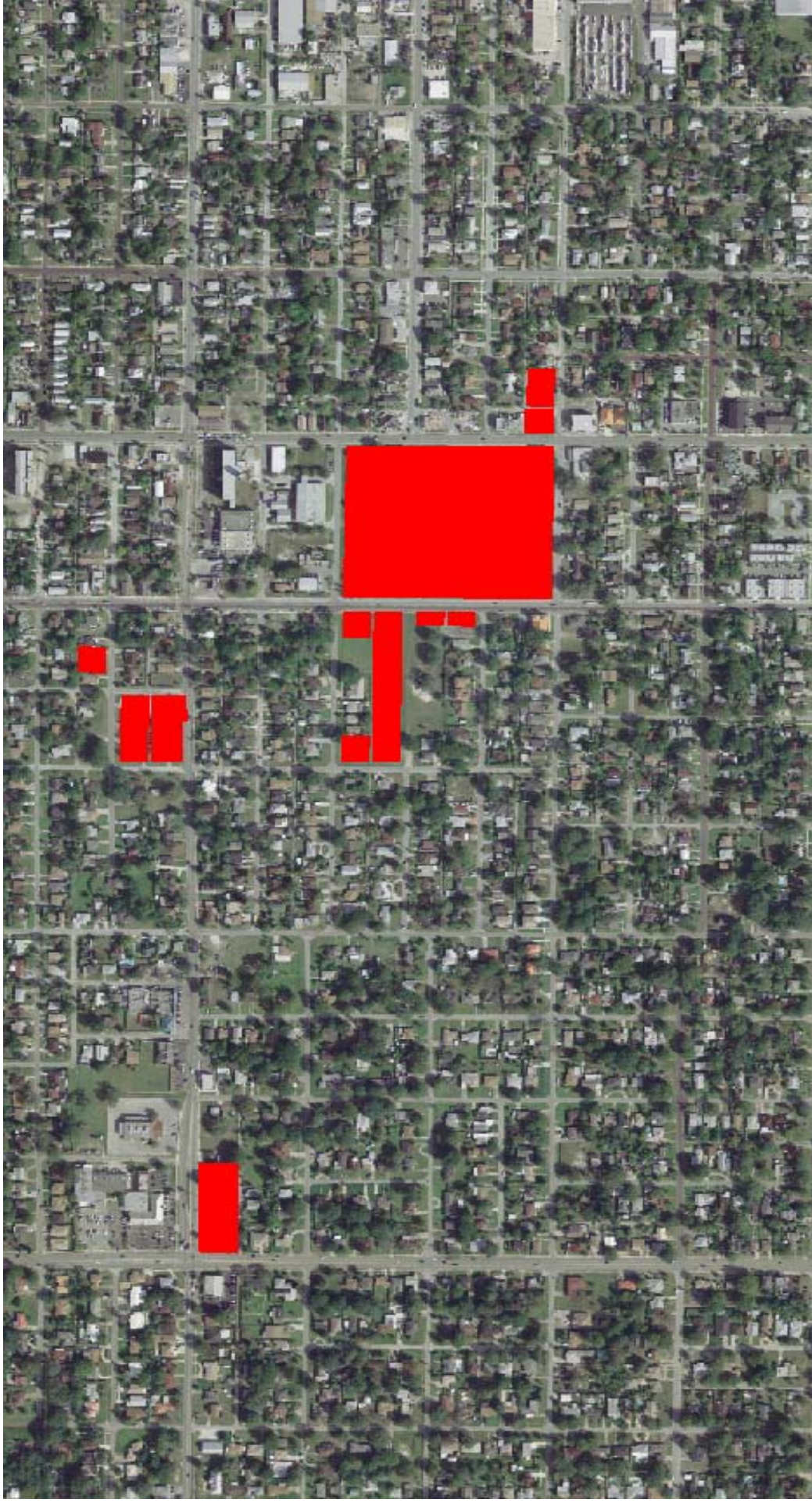
- Analysis indicates less tree cover on public right-of-way in neighborhoods containing a higher proportion of African-Americans, low-income residents, and renters
- How does this impact future street tree planting?
 - Should these neighborhoods be targeted for planting?
 - Will residents care for the trees?
 - Is education/marketing needed?

Applications: Riparian Buffers



Applications: Public Land Tree Planting

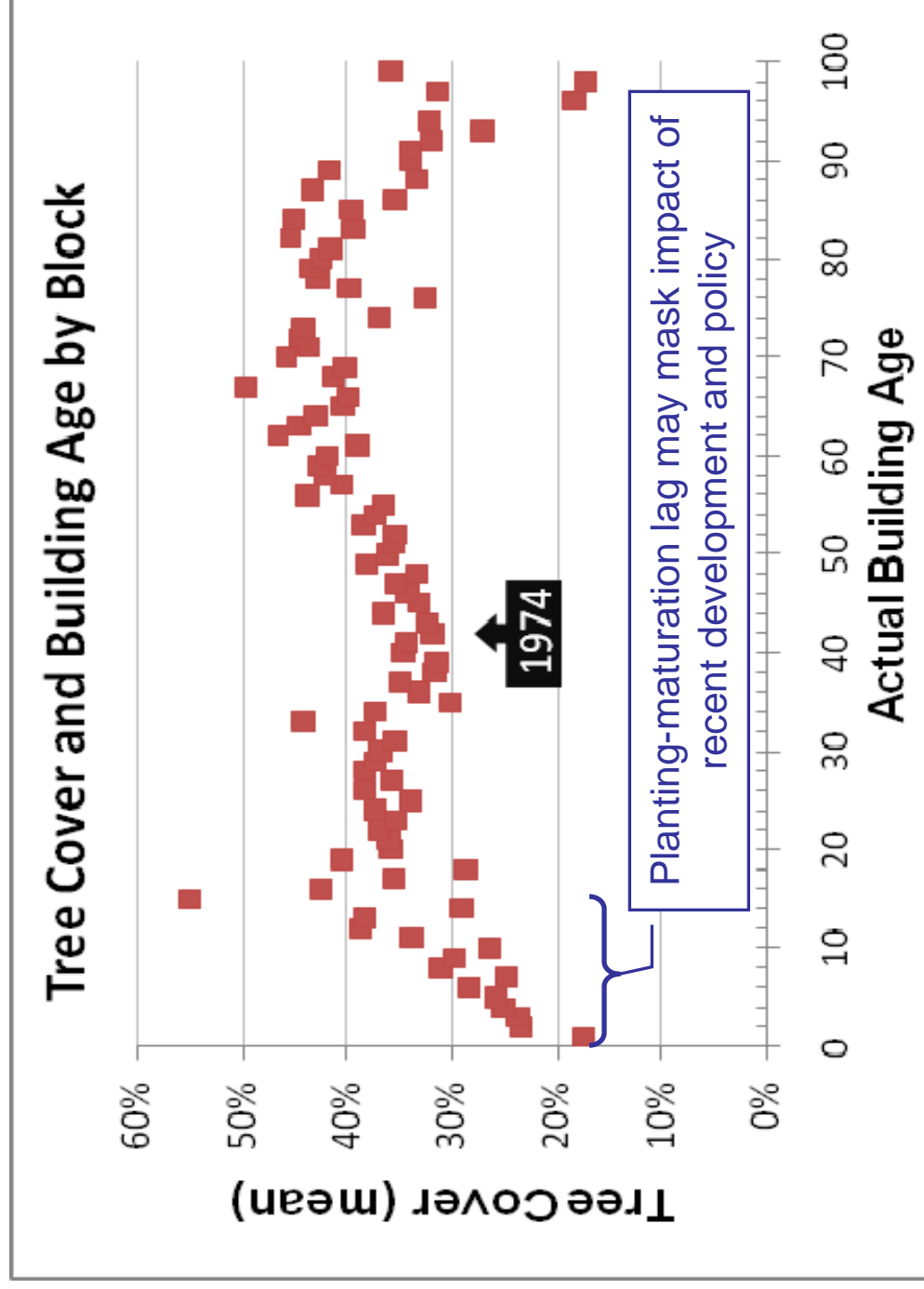
Public land use parcels with <10% tree cover but >10% other vegetation



Preliminary Examination of Regulatory Impact

Tree cover increased with greater % of homes built after 1974

- suggests regulatory influence of tree ordinance



Part Two: Ecological Analysis

- Complete an updated & more thorough ecological analysis
- Assess the ecological health
- Estimate the ecological and economic benefits

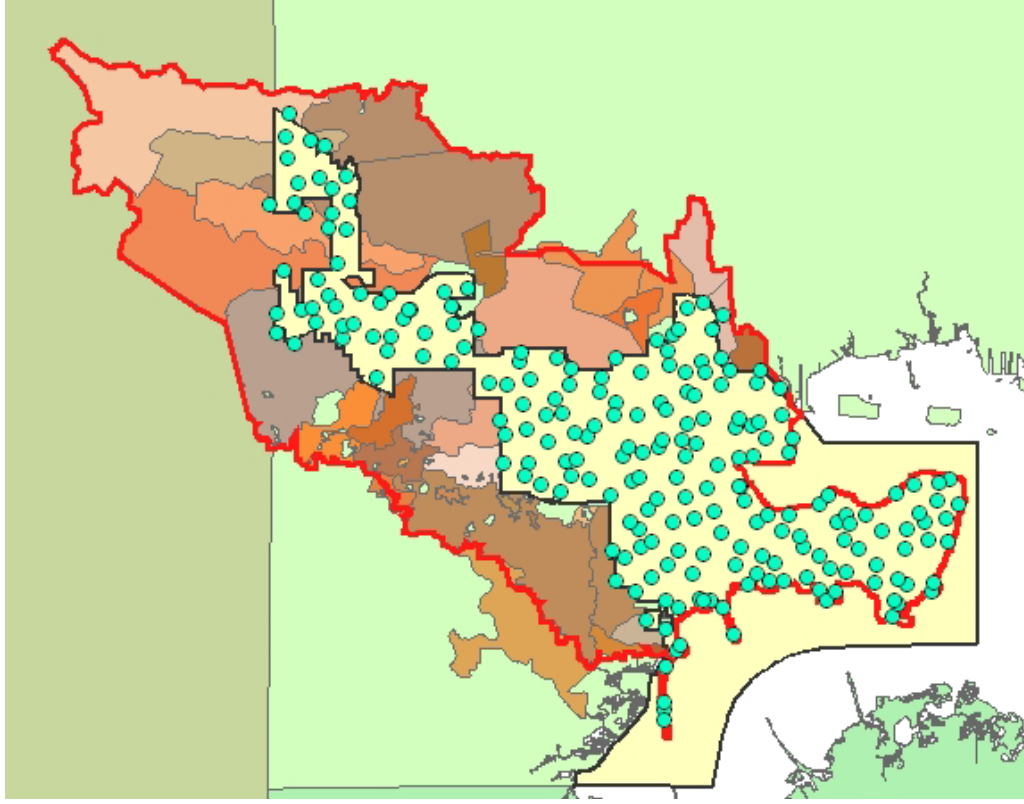


The most scientifically robust system available to describe the urban forest: Structure, Composition & Function



200 Randomly Selected Permanent Plots

Sample size of 200 plots has been shown in prior studies to optimize efficiency and minimize variation for a study area the size of Tampa.



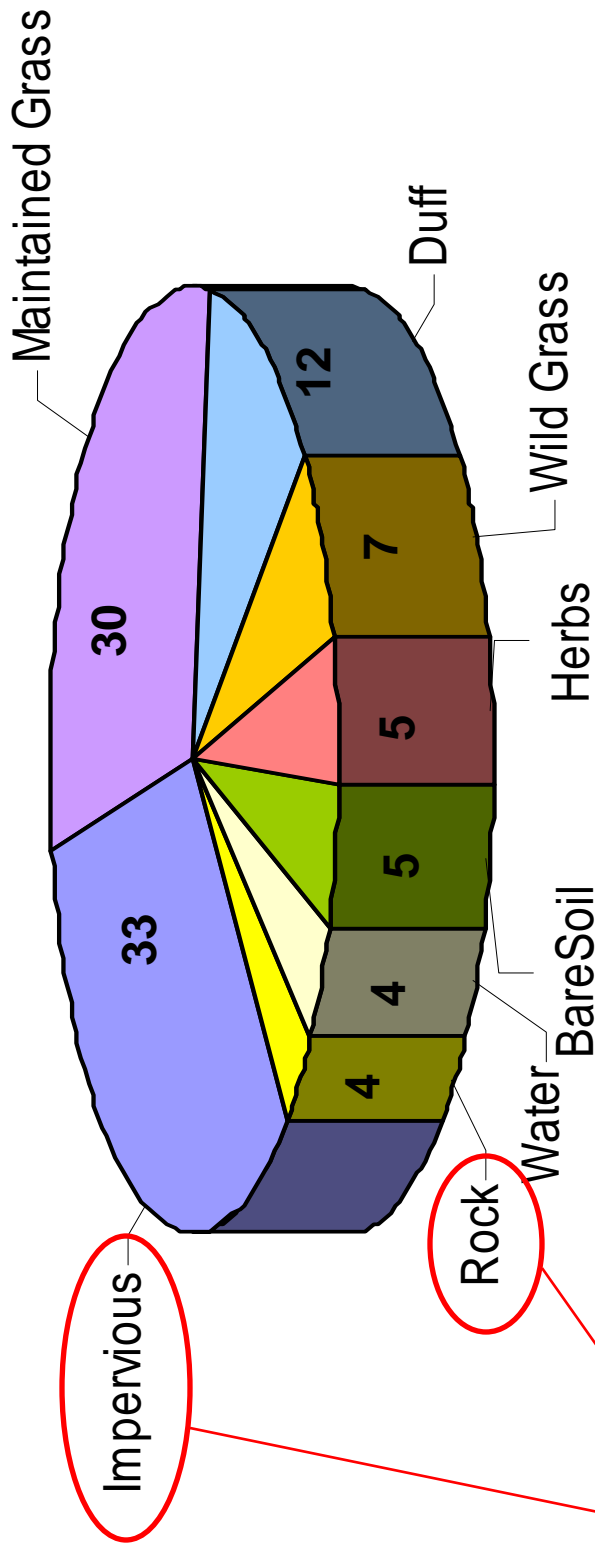


- **Plots captured ground based information such as:**
 - Ground cover
 - Shrub cover & composition
 - Individual tree measures:
 - Diameter
 - Height
 - Crown Area
 - Crown Condition
- **Information describes the forest at the level where we work and live.**

Results – Tree Canopy Cover

- Two independent methods for measuring the aerial extent of the urban forest....
- Remote Sensing = 29.0%
- Field Sampling (UFORE) = 28.1%

Results –Ground Cover

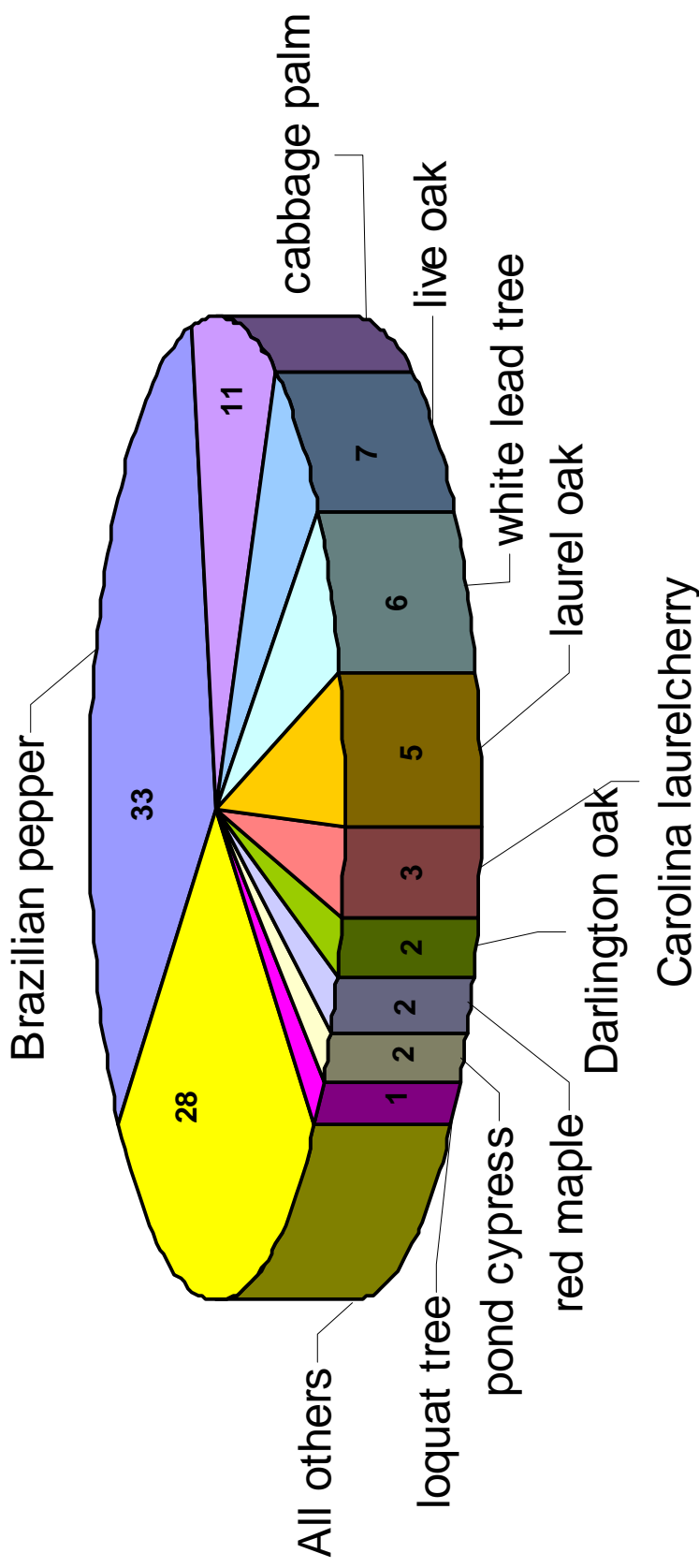


Remote sensing results agreed with field-sampling:
Impervious = 36% (included “impervious” and “rock”)

Species Diversity (Excluding Mangrove)

Total Number of Trees: ~3.9 million (>7.8 million w/mangrove)

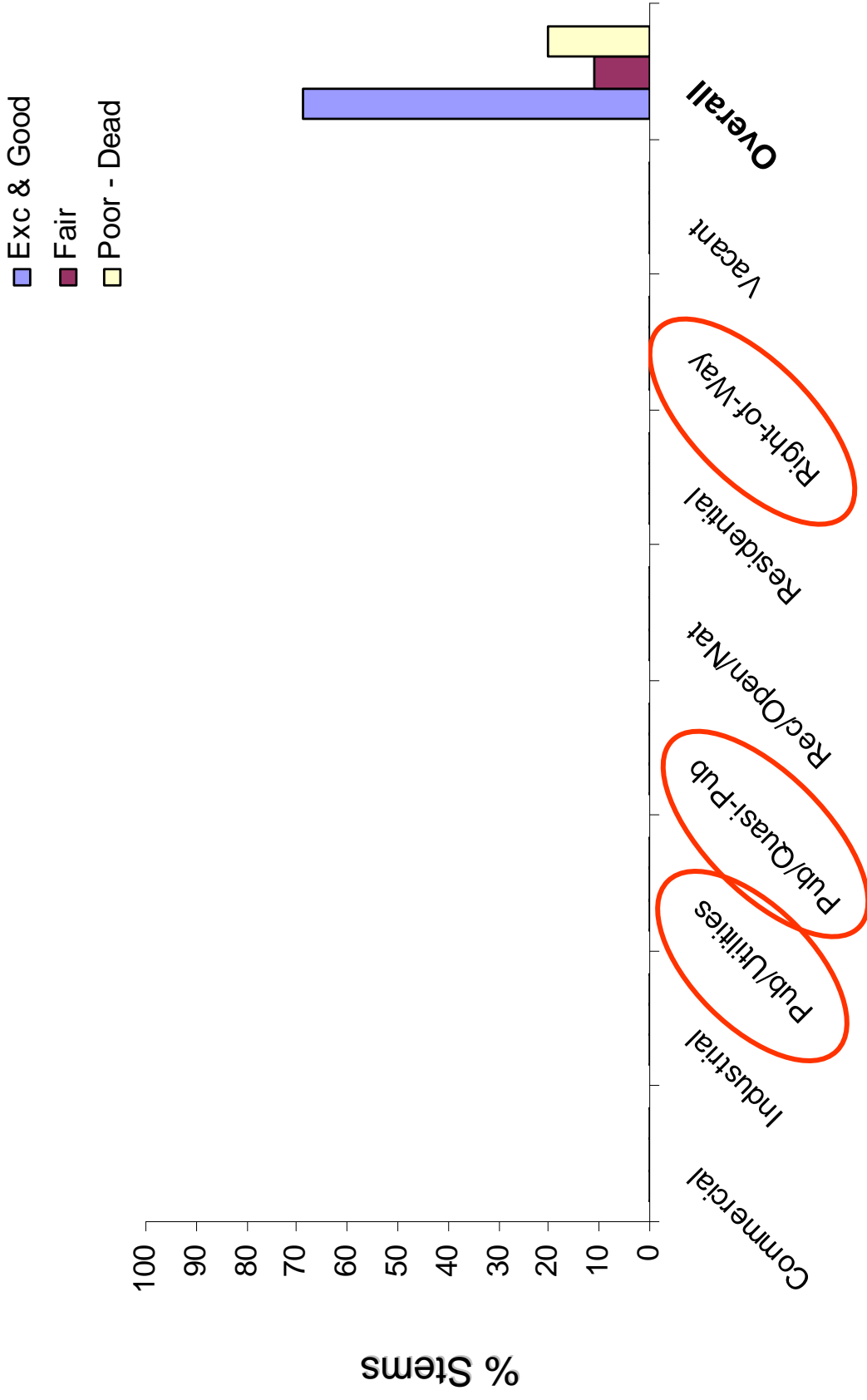
Compensatory value: ~\$1.2 billion



**Tree = woody stem > 1 inch
diameter at breast height**

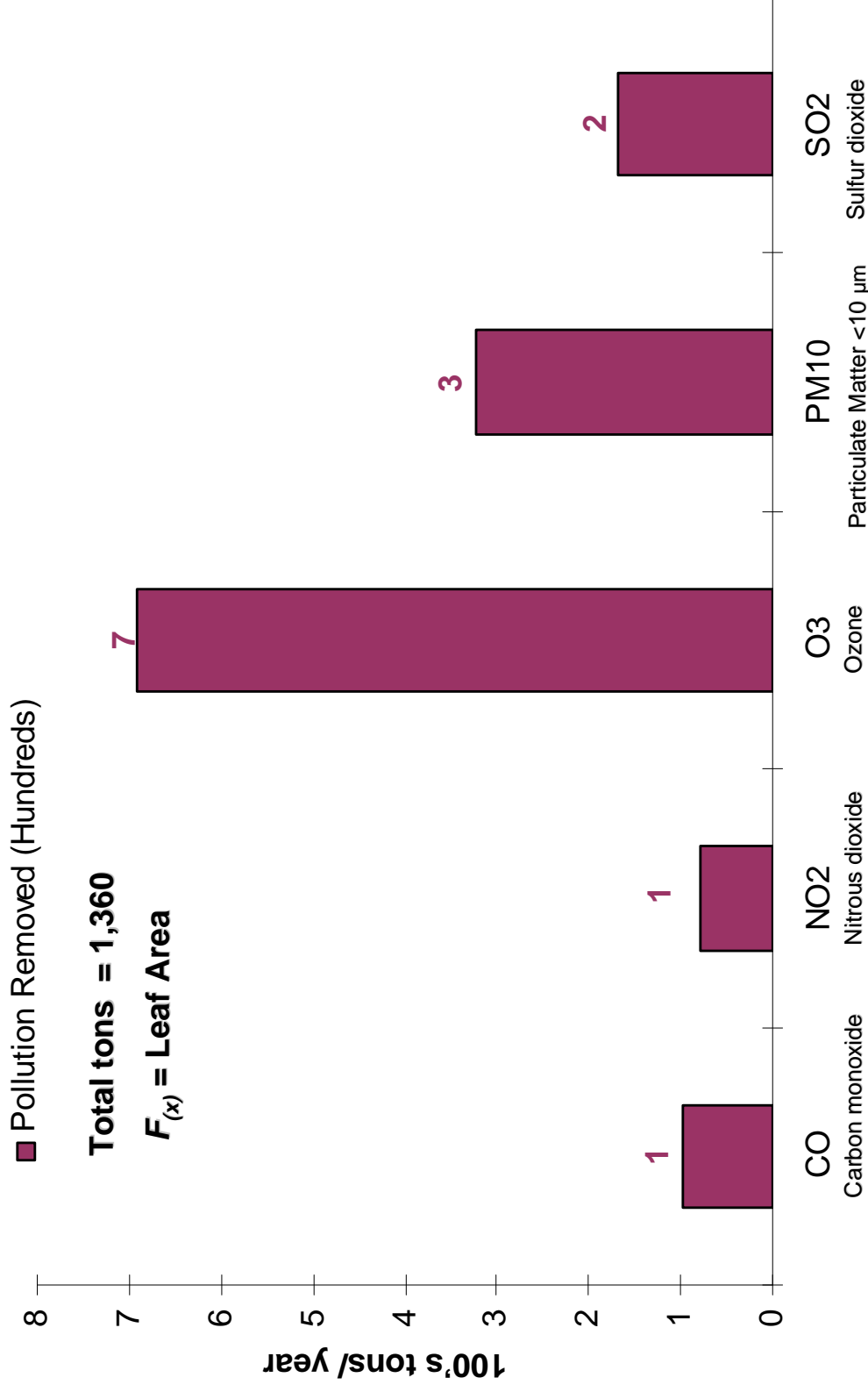


Tree Health by Land Use



2007 - Pollution Removal

1 yr value = \$6.3 million*



* Based upon median externality values

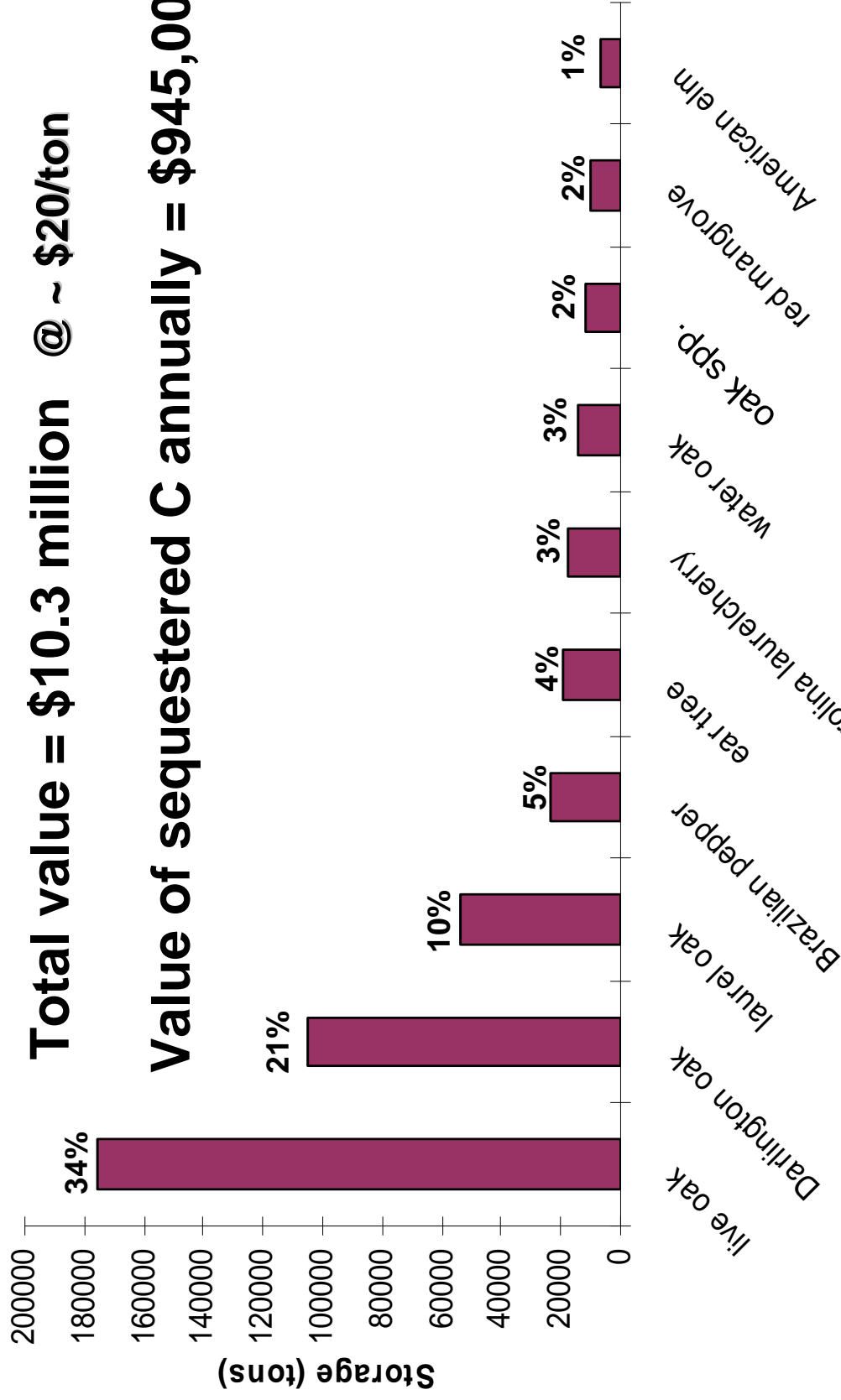


Current Carbon Storage

Relative \$ Contribution

Total value = \$10.3 million @ ~ \$20/ton

Value of sequestered C annually = \$945,000



Residential Energy Conservation

2007

	Heating	Cooling	Total
US Dollars Saved	\$112,620	\$3,967,322	\$4,079,942

Carbon avoided	68 tons	6,117 tons	6,185 tons
	\$1,389	\$124,292	\$125,681

Total value: ~\$4.2 Million



Next Steps

- Strategies for the sustainability of Tampa's urban forest (Summer-Fall 2008)
- Complete analysis of the urbanizing forest area in the watershed surrounding Tampa (underway).
- Leverage existing research efforts....
- Academic Publications





Creating a Vision for Tampa's Urban Forest

Facilitator: B. Terry Johnson, AICP

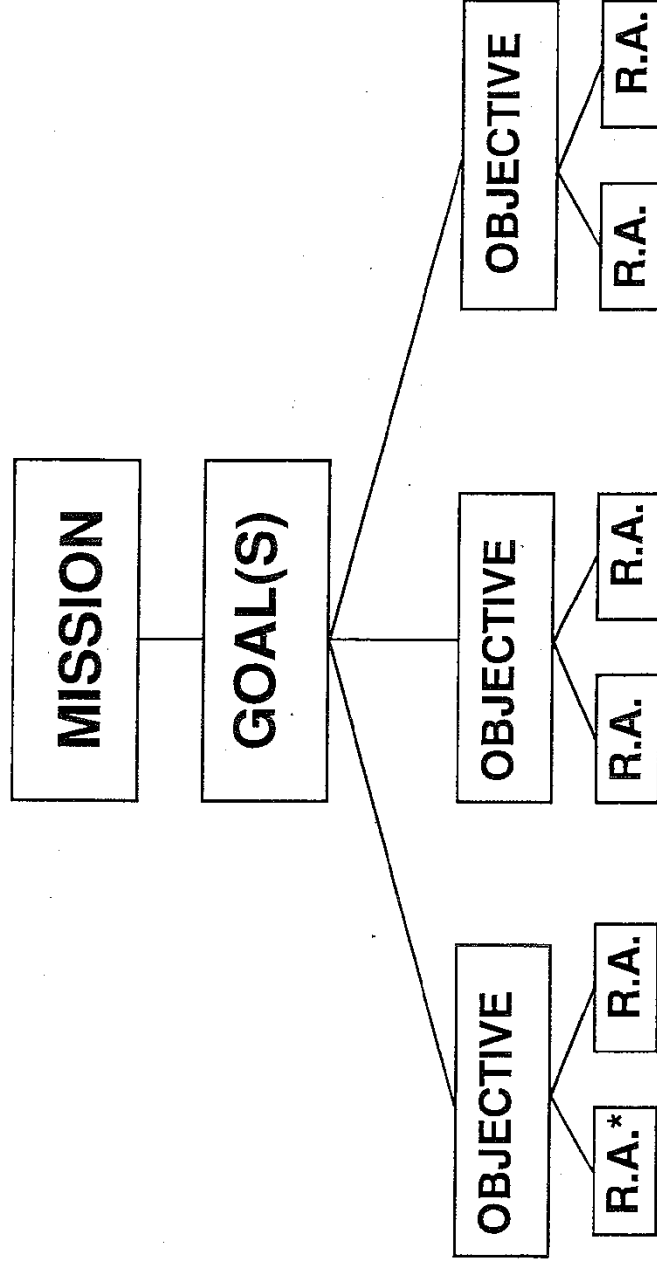
Facilitator Role

To assist in the development of the Committee's planning tools and direction for Tampa's urban forest.

Planning Tools / Timing

- Meeting 1: Creating a Vision
- Meeting 2: Goal Development
- Meeting 3: Setting Strategies

CLASSIC PLANNING HIERARCHY



*R.A. = RECOMMENDED ACTIONS

VISIONING

The process of identifying and defining our preferred future.

“Vision is the art of seeing things invisible.”

Jonathan Swift

Achieving Visionary Leadership*

Vision + Communication = Shared Purpose

Shared Purpose + Empowered People +
Appropriate Organizational Changes +
Strategic Thinking = Successful Visionary
Leadership

* Source: *Nanus; Visionary Leadership*

Contemplating the vision is
important because.....

If you don't know where you are going, any
road will take you there.

Sample Urban Forest Visions

Seattle's urban forest is a thriving and sustainable mix of tree species and ages that creates a contiguous healthy ecosystem, valued and cared for by the City and all its citizens as a vital environmental, economic and community asset.

http://www.seattle.gov/environment/urban_forest.htm

Sample Urban Forest Visions

Our vision for Canadian towns and cities is a canopy of trees, sheltering and protecting our communities; part of a green infrastructure that promotes habitat, healthy air, clean water, quality of life and economic prosperity.

<http://www.treecanada.ca/publications/pdf/cufs.pdf>

THE VISION IN CONTEXT

The vision of the (City of Tampa Comprehensive) Plan (2008 Draft) is about creating an attractive and safe city that evokes pride, passion and a sense of belonging – a city where everybody cares about quality of life.

http://plan2025.org/draft-plan/tampa-comprehensive-plan-draft-v-5/Chapter%201_Version%205.pdf

HEADLINERS

An exercise.....

KEY WORDS AND PHRASES

What words and/or phrases best represent your view of what you would like to see in the urban forest or feel it could add to the city well out into the future?

PARTING THOUGHT

If you are planning for a year, sow rice; if you are planning for a decade, plant trees; if you are planning for a lifetime, educate people.

(Chinese proverb)

Next Meeting

- October 21, 4 - 6:00 PM
- Developing Goals to support the Vision
 - Welcome and Purpose (Karen Palus)
 - Review the Vision Statement (Rob Northrop)
 - Develop Goals that support the Vision Statement (Facilitator – Terry Johnson)
 - Discuss Next Meeting's Agenda (Rob Northrop)

MAYOR'S STEERING COMMITTEE ON URBAN FOREST SUSTAINABILITY

September 16, 2008

Hunt Community Center

4810 North Himes Avenue

4:00 PM

AGENDA – MEETING 1

- I. Welcome / Meeting Purpose (Karen Palus)
- II. Connecting People to the Urban Forest – Benefits and Costs of the Urban Forest (Rob Northrop)
- III. Report on Tampa's Urban Forest (Michael Andreu and Shawn Landry)
- IV. Creating a Vision for Tampa's Urban Forest (Facilitator: B. Terry Johnson)
- V. Discuss Next Meeting's Agenda (Rob Northrop)

MAYOR'S STEERING COMMITTEE ON URBAN FOREST SUSTAINABILITY

October 21, 2008

Hunt Community Center

4810 North Himes Avenue

4:00 PM

AGENDA – MEETING 2

VI. Welcome / Meeting Purpose (Karen Palus)

VII. Finalizing Our Vision Statement (Facilitator: B. Terry Johnson)

VIII. Establishing Our Goals for the City's Urban Forest (Facilitator: B. Terry Johnson)

- A) Process Overview
- B) Priority Goal Categories
- C) What does a Goal look like?
- D) Breakout Team Assignments

IX. Discuss Next Meeting's Agenda (Rob Northrop)

MAYOR'S STEERING COMMITTEE ON URBAN FOREST SUSTAINABILITY

November 18, 2008

Hunt Community Center

4810 North Himes Avenue

AGENDA – MEETING 3

X. Welcome / Meeting Purpose (Joe Green)

XI. Finalizing Our Vision Statement (Facilitator: B. Terry Johnson)

XII. Discussion and Approval of Goals for the City's Urban Forest (Facilitator: B. Terry Johnson)

XIII. Development of Strategies to Support Goals

Discuss Next Meeting's Agenda and Remaining Steps (Rob Northrop)

MAYOR'S STEERING COMMITTEE ON URBAN FOREST SUSTAINABILITY

January 20, 2009

Hunt Community Center

4810 North Himes Avenue

AGENDA – MEETING 4

XIV. Welcome / Meeting Purpose (Karen Palus)

XV. Review of Finalized Planning Tools (Facilitator: B. Terry Johnson)

A) Vision

B) Goals

XVI. Discussion and Approval of Priority Strategies for the City's Urban Forest (Facilitator: B. Terry Johnson)

XVII. Where do we go from here? (Karen Palus / Rob Northrop)

XVIII. Recognition and Appreciation to Committee Members (Karen Palus)



CITY OF TAMPA

Pam Iorio, Mayor

Parks and Recreation Department

Natural Resource Section

COMMITTEE ON URBAN FOREST SUSTAINABILITY

MINUTES OF MEETING – September 16, 2008
Hunt Community Center @ Al Lopez Park

Meeting One (Sept. 16) – Purpose: Connecting People to the Urban Forest – Benefits and Costs of the Urban Forest

Meeting Two (Oct. 21) – Review Vision Statement and Develop Goals that support the Vision Statement

Meeting Three (Nov. 18) – Review Vision Statement and Goals and Develop Strategies that support Vision Statement and Goals

In Attendance: Richard Bailey, David Crawley, Tom Deal, Cliff Fernandez, Melanie Higgins, Wofford Johnson, Carolyn McKinney, Terry Neal, James Palma, David Rigall, John Sample, Sylvia Smith, John Webster and Ronnie Oliver.

Facilitators Dr. Michael Andreu, Shawn Landry, Rob Northrop and B. Terry Johnson **and Parks and Recreation staff in attendance:** Karen Palus, Joe Green, Brad Suder, Kathy Beck, David Reilly, Bruce Lucas and Diane Bennett.

Karen Palus welcomed everyone to today's meeting and thanked everyone for their participation. Each attendee then gave a brief introduction on their affiliation and interest in serving on the committee.

Rob Northrop began the meeting and presented today's purpose; *Connecting People to the Urban Forest – Benefits and Costs of the Urban Forest* and stated that each member should have received a report on the City of Tampa Urban Ecological Analysis 2006-2007 as well as a publication titled "The Benefits of Urban Trees".

Shawn Landry presented a report on Tampa's Urban Forest and gave a brief summary of the canopy analysis. He then spoke about tree cover change analysis from 1975 to 2006 with the results from 2006 being most accurate. Discussion then took place on making use of tree cover results by neighborhood with example illustrations on ROW areas that have opportunities for tree planting.

Dr. Andreu also reported on Tampa's Urban Forest and presented the ecological benefits of trees. He also discussed the UFORE (Urban Forest Effects) model that offers the best scientific results available today. The results of the UFORE model were very similar to the canopy analysis percentages (robust model). The use of randomly selected plots (1/10 of an acre in size) gives a snapshot of trees located throughout the city. The plots captured ground-based information, i.e., shrub and tree cover. This information will serve as the benchmark for future analyses.

Also discussed were the results of tree canopy cover; 3.9 million trees (excluding mangroves); over 7.8 million with the mangroves included. This number of trees has a compensatory total of 1.4 billion dollars! Brazilian pepper trees account for the largest majority of trees in the City of Tampa.

Economic savings totaling 4.2 million dollars in residential energy conservation is noted for heating/cooling purposes. In addition, physical barriers and ozone pollutants are being removed from the atmosphere.

Terry Johnson then presented *Creating a Vision for Tampa's Urban Forest* and the purpose of the Committee "Vision – Goals and Strategies" and the facilitator's role to assist in the development of the committee's planning tools. "Vision is the art of seeing things invisible". The Vision of the City of Tampa Comprehensive Plan (2008 draft) is about creating an attractive and safe city that evokes pride, passion and a sense of belonging – a city where everybody cares about quality of life.

Mr. Johnson then asked the committee to do an exercise wherein they were asked to do a mock "headline" such as you might see in the Tampa Tribune or St. Pete Times in 2035; the best case scenario and the worst case scenario of the changing urban forest.

The committee then listed phrases and/or words that best represent the view of what you would like to see in the urban forest or what it could add to the City out into the future. Some of those mentioned were

- wildlife habitat
- aesthetics
- self-sustaining natural resources
- global warming
- energy efficiency
- quality of life
- tourism/economic benefits
- runoff reduction,
- improved air/water quality, among others (see attached; Key Words and Phrases)

Mr. Johnson asked committee members to respond to a survey they will be receiving on September 29th via email and to submit their "choices" to Diane Bennett by October 9th. These will be forwarded to Mr. Johnson who will process them for the meeting on October 21, 2008.

Meeting adjourned at 6:00 p.m.

Respectfully Submitted,
Diane Bennett



CITY OF TAMPA

Pam Iorio, Mayor

Parks and Recreation Department

Natural Resource Section

COMMITTEE ON URBAN FOREST SUSTAINABILITY

MINUTES OF MEETING – October 21, 2008
Hunt Community Center @ Al Lopez Park

Meeting Two (Oct. 21) – Review Vision Statement and Develop Goals that support the Vision Statement.

Meeting Three (Nov. 18) – Review Vision Statement and Goals and Develop Strategies that support Vision Statement and Goals.

In attendance: Richard Bailey, David Crawley, Tom Deal, Cliff Fernandez, Melanie Higgins, Evan Johnson, Wofford Johnson, Carolyn McKinney, Terry Neal, David Rigall, John Sample, Sylvia (Nootchie) Smith, and John Webster. Ronnie Oliver was not in attendance.

Facilitators: B. Terry Johnson, and Rob Northrop and **Parks and Recreation Staff in attendance:** Karen Palus, Joe Green, Brad Suder, Kathy Beck and Diane Bennett.

Karen Palus welcomed everyone to today's meeting and thanked everyone for attending and taking part in this valuable and worthwhile endeavor.

The vision statement previously submitted was discussed. "Our vision to sustain Tampa's urban forest requires both maintaining and growing the city's canopy and in order to optimize the quality of life for citizens now and in the future, from realizing economic benefits and the many "services" nature provides to seizing the opportunities to better understand the workings of our natural environment through public education and scientific research that advances our community."

Ms. McKinney inquired of Terry Johnson exactly where this information will be in print and to whom it would be seen by. Terry responded that it would be presented to the director of Parks and Recreation and is intended to be used as a document for guidance. Mr. Northrop stated this information will be included on his website at University of Florida IFAS as well as the Hillsborough County Extension website.

Discussion was held on the draft vision statement. It was decided that Mr. Terry Johnson will rework the vision statement based on comments and resend to Committee members. Mr. Johnson then discussed the Priority Goal Categories that were identified by Committee members in the survey sent to each member, i.e., (Biodiversity/Habitat, Education and Research, Forest/Tree Maintenance, Public/Private Partnerships, Regulation/Incentives and Sustainability).

The Committee was broken into two breakout teams and each team was asked to draft goals for each of the six categories. A goal was defined as a desirable end-statement expressed in fairly broad language, e.g., “to promote best practices in tree care, production and management for sustainable urban forests” (Florida Urban Forestry Council”) **or** “to improve public safety in neighborhoods to provide a secure environment for residents”). Group one was Team Oak and Group two was Team Palm. Each group was assigned three (3) goal categories.

Mr. Terry Johnson explained there is a two-step process for writing a goal, 1) define your terms. Example: by “energy efficiency” we mean recognition of the role the urban forest plays in moderating our climate and reducing energy use by the citizens of Tampa, and 2), begin with “to” and an action word, i.e., to promote public awareness of the energy efficiency role the urban forest plays while enhancing this function through support for strategic planting”.

Team Oak and Team Palm reviewed and revised each others goal statements, however, due to time constraints, the final product was tabled until the next meeting on November 18. At that time, discussion will begin again on “goals” identified.

Meeting adjourned at 6:00 p.m.

Respectfully submitted,
Diane Bennett



CITY OF TAMPA

Pam Iorio, Mayor

Parks and Recreation Department

Natural Resource Section

COMMITTEE ON URBAN FOREST SUSTAINABILITY

MINUTES OF MEETING – November 18, 2008
Hunt Community Center @ Al Lopez Park

Meeting Three (Nov. 18) – Review Vision Statement and Goals and Develop Strategies that support Vision Statement and Goals.

In attendance: Richard Bailey, Tom Deal, Evan Johnson, Wofford Johnson, Carolyn McKinney, Terry Neal, David Rigall, John Sample, Sylvia (Nootchie) Smith, and John Webster.

Facilitators: B. Terry Johnson, Rob Northrop and Shawn Landry. **Parks and Recreation staff in attendance:** Joe Green, Brad Suder, Kathy Beck and Diane Bennett.

Mr. Green welcomed everyone to today's meeting and informed that Karen Palus had a previous commitment but would try to join in if possible.

Terry Johnson handed out the second draft of the vision statement and asked for ideas and clarifications if needed. He informed that we would again break into two groups, i.e., Team Palm (facilitated by Rob Northrop) and Team Oak (facilitated by Terry Johnson) to begin drafting strategies. Each group will designate a spokesperson and each group will have three goals to address.

At this time the two groups formed and began discussion on how to implement the revised goals.

Respectfully submitted,

Diane Bennett

MAYOR'S STEERING COMMITTEE ON URBAN FOREST SUSTAINABILITY

JANUARY 20, 2009

Facilitator: B. Terry Johnson, AICP



COMMITTEE PURPOSE

To develop “... a vision statement, goals and implementable strategies to guide urban forestry policy and management efforts within the City of Tampa in a manner that supports the *Tampa Comprehensive Plan* – *Building Our Legacy A Livable City.*”



THE VISION

Maintain and expand Tampa's urban forest in recognition of the many benefits it provides, including: enhancing quality of life for present and future citizens, attaining numerous economic and ecological benefits Nature provides, and seizing opportunities to better understand our natural environment through scientific research and public education.



GOALS

BIODIVERSITY / HABITAT: To understand and communicate the need to maintain and protect the complexity of natural systems in the urban forest so that the public will support a rich, diverse habitat.

EDUCATION / RESEARCH: To advance public appreciation of the economic, social and environmental values of Tampa's urban forest in all education settings, from in-school to adult education and public service campaigns, so as to create an ethic of individual stewardship.

FOREST / TREE MAINTENANCE: To promote proper tree care in the urban forest through education and enforcement.



GOALS (continued)

PUBLIC / PRIVATE PARTNERSHIPS: To create inclusive partnerships that encourage collaboration among all affected parties to benefit Tampa's Urban forest.

REGULATION / INCENTIVES: To improve the policy framework for the conservation, reclamation, restoration and increase of natural resources within the urban forest.

SUSTAINABILITY: To promote recognition, maintenance and regeneration of Tampa's urban forest that is economically and ecologically feasible.



PRIORITY STRATEGIES

Biodiversity / Habitat

- 1) Develop more natural parks and make use of other open areas to enhance the urban forest.
- 2) Make the City more walkable (including wildlife corridors).
- 3) Institute design with nature principles, e.g., graywater use, cisterns, self-sustaining systems.



PRIORITY STRATEGIES

Education / Research

- 1) Start education on the urban forest in early grades, including development of specific curricula.
- 2) Promote the City as a living laboratory (e.g., Bayshore and the Riverwalk as object lessons in tree knowledge, planting and research).
- 3) Use fact sheets and other methods to dispel the “danger” of trees argument.



PRIORITY STRATEGIES

Forest / Tree Maintenance

- 1) Develop Urban Forest Management Plan.
- 2) City should require certification for enforcement.
- 3) Education by the City of citizens and community members.



PRIORITY STRATEGIES

Public / Private Partnerships

- 1) Form specific group to promote the urban forest and its benefits (non-profit – new or existing).
- 2) More resident involvement in development decisions (including better accessibility to ordinances, etc.).
- 3) Carbon credits for land bank contributions.



PRIORITY STRATEGIES

Regulation / Incentives

- 1) Review and revise Chapter 13 (including a look at the process) in context of Chapter 27.
- 2) Develop performance standards providing core for good landscape in Chapter 13.
- 3) Give Parks Department authority over environmental regulation.



PRIORITY STRATEGIES

Sustainability

- 1) Right (tree) plant / right place.
- 2) More community participation in conservation, etc. (existing conservation groups).
- 3) Tree planting program.



Growth is inevitable and desirable, but destruction of community character is not. The question is not whether your part of the world is going to change. The question is how.

(Edward T. McMahon, The
Conservation Fund)



Where do we go from here?

- Existing efforts at Parks and Recreation
- Tampa Strategic Plan
- Process for developing an Urban Forestry Plan



Tampa's Strategic Plan

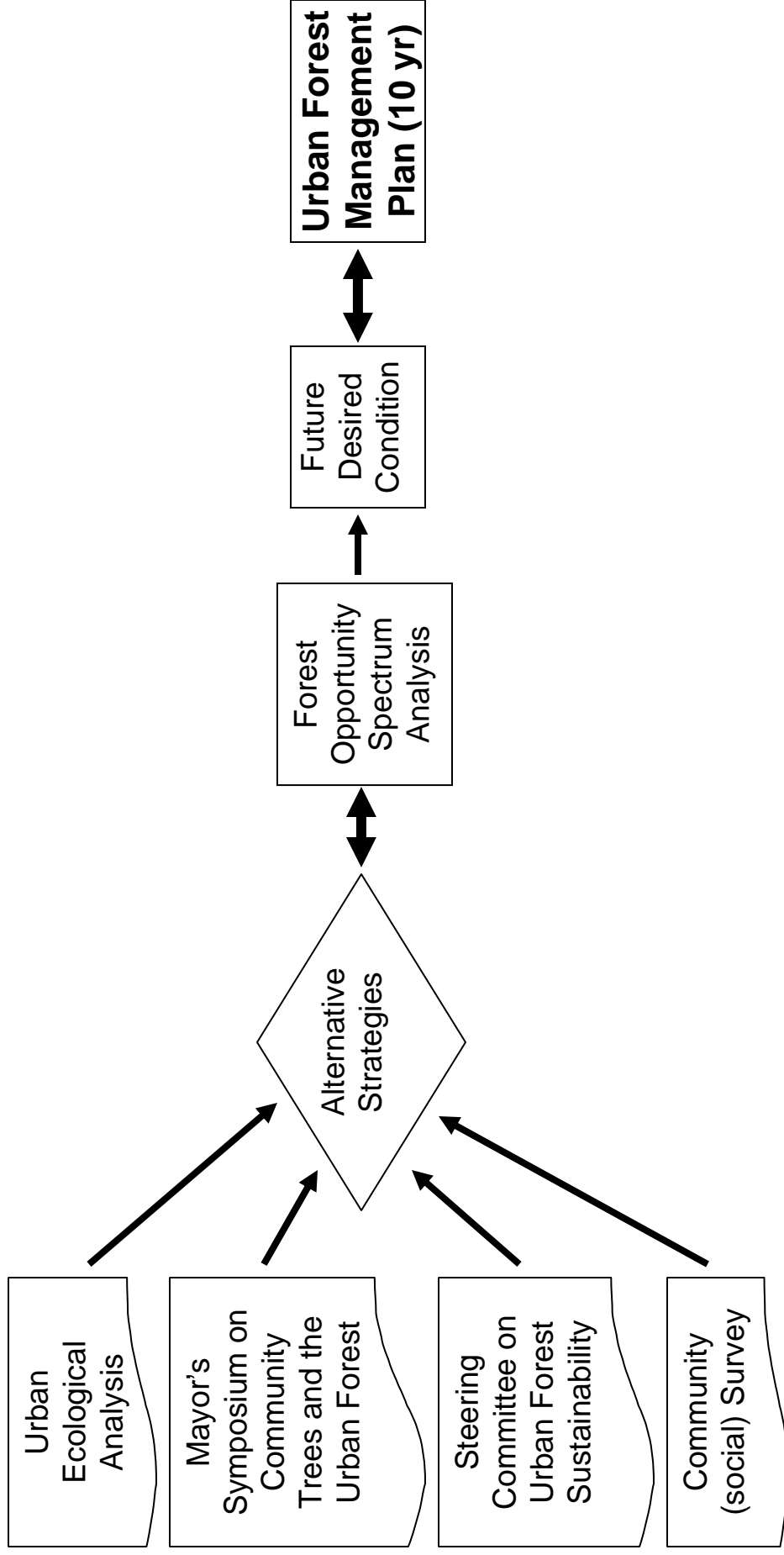
Objective 1.3: Improve and maintain the appearance of Tampa's neighborhoods.

Sub-Objective 1.3c: Improve and maintain the appearance of Tampa's neighborhoods by planting trees in neighborhoods and parks during FY08 as part of the Community Tree Planting Program.

Task	
1.3.c.1	Compile & promote list of eligible planting locations citywide. Target specific neighborhoods and available planting locations in conjunction with the 2008 Urban Ecological Analysis and Urban Forest Masterplan.
1.3.c.2	Promote program through Urban forestry web page (neighborhood ROW trees) and auto application as well as neighborhood outreach and meetings.
1.3.c.3	Retrieve applicant information from message center, phone inquiries and on-line applications.
1.3.c.4	Evaluate site locations for appropriateness according to Best Management Practices and the Urban Forest Steering Committee Goals and Strategies.
1.3.c.5	Schedule contractor and provide list and routing information.
1.3.c.6	Coordinate watering needs with citizens receiving trees.
1.3.c.8	Meet with Budget office to review program and funding requests through the Tree Trust Fund.



Process for Developing an Urban Forestry Plan

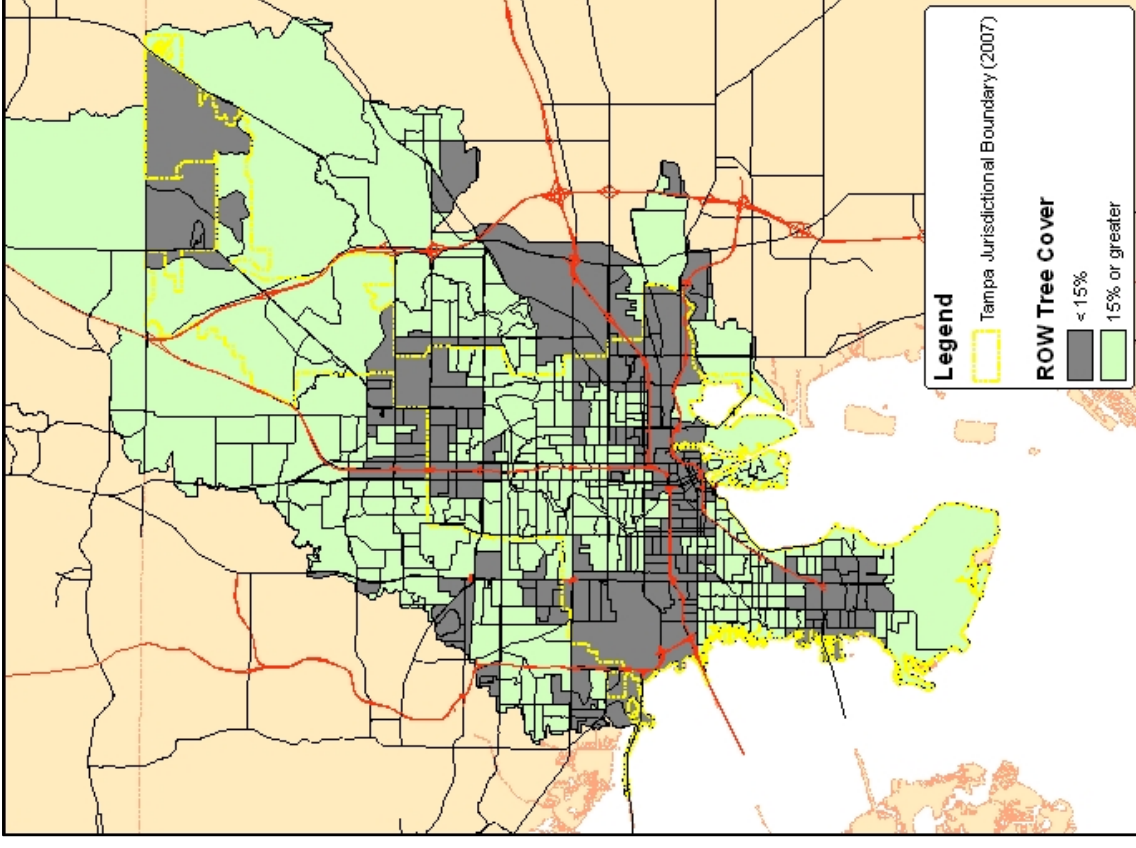


Example Strategy

Alternative Strategy: Increase Street Tree Cover to 15% Minimum

The extent of street tree cover varies widely throughout Tampa, from less than 4% to over 58%. However, there exists much potential for additional street tree planting even in those neighborhoods currently lacking street trees. This strategy targets street tree plantings in neighborhoods with less than 15% ROW tree cover in order to improve walkability and increase the equitability of street tree distributions.

Statistic	Current	Strategy Outcome
Acres in PROW	12,103	-
% of city land base	16.2%	-
Canopy coverage (minimum)	4%	15%
Canopy coverage (average)	19%	? %
Est. Number of Trees	?	?
<i>Plantings needed</i>		
		?
<i>One-time cost of plantings</i>		
Maintenance Costs (value \$ / yr)	\$?	\$?
Benefits (value \$ / yr)		
<i>Pollution Removal (value \$ / yr)</i>		
	\$?	\$?
<i>Carbon Sequestration (tons)</i>		
Carbon Sequestration (value \$ / yr)	\$?	\$?
Energy Conservation (value \$ / yr)	\$?	\$?
Compensatory value (value \$ / yr)	\$?	\$?
Net Benefit (Benefits – Costs) (value \$ / yr)	\$?	\$?



Closing Thoughts



MAYOR'S STEERING COMMITTEE ON URBAN FOREST SUSTAINABILITY

January 22, 2009

FINAL VISION, GOALS AND STRATEGIES

The Committee completed work at its January 20, 2009 final meeting, accomplishing its purpose of developing a vision statement, goals and implementable strategies to guide urban forestry policy and management efforts within the City of Tampa in a manner that supports the *Tampa Comprehensive Plan – Building Our Legacy – A Livable City*. The elements of the planning hierarchy are provided below, including a set of priority strategies associated with each goal. In addition to the recommended priorities, “other strategies” under each goal are provided (in no particular order) for consideration by the Parks and Recreation Department.

VISION

The Mayor's Steering Committee on Urban Forest Sustainability, made up of a representative cross-section of affected parties from the private, public and non-profit sectors, offers the following vision aimed at sustaining the City's urban forest:

Maintain and expand Tampa's urban forest in recognition of the many benefits it provides, including: enhancing quality of life for present and future citizens, attaining numerous economic and ecological benefits Nature provides, and seizing opportunities to better understand our natural environment through scientific research and public education.

GOALS AND STRATEGIES

BIODIVERSITY / HABITAT

GOAL: To understand and communicate the need to maintain and protect the complexity of natural systems in the urban forest so that the public will support a rich, diverse habitat.

Priority Strategies

- 1. Develop more natural parks and make use of other open areas to enhance the urban forest.**
- 2. Make the City more walkable (including wildlife corridors).**
- 3. Institute design with nature principles, e.g., graywater use, cisterns, self-sustaining systems.**

Other Strategies

Assure species selection for new plantings match soil / water conditions and space needs.

Develop guidelines and promote appropriate fertilizer and other chemicals use within the forest.

Create relationship between density and contributions to a community land bank (e.g., using Transfer of Development Rights or TDRs as an incentive).

Eliminate destructive non-native species, and study / use beneficial non-natives.

Coordinate with the Florida Department of Transportation (FDOT) to correct past abuses and protect existing trees.

Encourage local growers to produce more native plants, and nurseries to sell them.

EDUCATION / RESEARCH

GOAL: To advance public appreciation of the economic, social and environmental values of Tampa's urban forest in all education settings, from in-school to adult education and public service campaigns, so as to create an ethic of individual stewardship.

Priority Strategies

- 1. Start education on the urban forest in early grades, including development of specific curricula.**
- 2. Promote the City as a living laboratory (e.g., Bayshore and the Riverwalk as object lessons in tree knowledge, planting and research).**
- 3. Use fact sheets and other methods to dispel the "danger" of trees argument.**

Other Strategies

Create a City Arboretum.

Increase training for green professionals.

Develop an awards program for outstanding development.

Institute a speakers bureau.

More localized food production.

Develop website and newsletter through Parks / Rec focused on key topics for neighborhoods.

Use City cable television to get the word out.

Develop a clearinghouse for information sources on the urban forest.

Create an Office of Interconnectivity to encourage connection of key entities in the community.

Mount a propaganda campaign for the urban forest.

Other (suggested by individual Committee members):

Living Lab – River (lower, middle, upper) and all areas of livable space as part of the ecosystem (big picture).

FOREST / TREE MAINTENANCE

GOAL: To promote proper tree care in the urban forest through education and enforcement.

Priority Strategies

- 1. Develop Urban Forest Management Plan.**
- 2. City should require certification of companies involved in tree care to enhance enforcement.**
- 3. Education by the City of citizens and community members.**

Other Strategies

Training for arborists and other professionals.

Neighborhood Tree Watch.

Hire an Urban Forester.

Use City employees to call in violations.

PUBLIC / PRIVATE PARTNERSHIPS

GOAL: To create inclusive partnerships that encourage collaboration among all affected parties to benefit Tampa's urban forest.

Priority Strategies

1. **Form specific group to promote the urban forest and its benefits (non-profit – new or existing).**
2. **More resident involvement in development decisions (including better accessibility to ordinances, etc.).**
3. **Carbon credits for land bank contributions.**

Other Strategies

Other (suggested by individual Committee members):

Open dialogue to discuss differences between development community and neighborhoods to find middle ground that benefits community at large.

Involve non-citizen organizations in development of living lab in their neighborhoods.

Team with Mayor's Beautification program in promoting urban forest sustainability issues and tree planting.

Runoff credits for tree preservation.

REGULATION / INCENTIVES

GOAL: To improve the policy framework for the conservation, reclamation, restoration and increase of natural resources within the urban forest.

Priority Strategies

1. **Review and revise Chapter 13 (including a look at the process) in context of Chapter 27.**
2. **Develop performance standards providing core for good landscape in Chapter 13.**
3. **Give Parks Department more enforcement authority over the urban forest.**

Other Strategies

Re-inspection of landscape and site permits.

Other (suggested by individual Committee members):

Create developer incentives to preserve, protect and restore the urban forest.

Natural Resources Review Board with quasi-judicial authority to impose penalties, approve development and encourage sustainability of urban forest.

Environmental stewardship ordinance.

SUSTAINABILITY

GOAL: To promote recognition, maintenance and regeneration of Tampa's urban forest that is economically and ecologically feasible.

Priority Strategies

- 1. Right (tree) plant / right place.**
- 2. More community participation in conservation, etc. (existing conservation groups).**
- 3. Tree planting program.**

Other Strategies

Shock approach.

Community partnerships – advisory committee.

Tree replacement program.

Identify areas lacking trees.

Other (suggested by individual Committee members):

Develop development incentives and mitigation process as path to sustainability – like LEEDS certification with “carrots” for excellence.

Restoration of entire ecosystems with practices that incorporate compatibility with urban lifestyles.

Tree planting program including tree replacement and planting areas that lack trees if appropriate.

Tampa's Strategic Plan

Objective 1.3: Improve and maintain the appearance of Tampa's neighborhoods.

Sub-Objective 1.3c: Improve and maintain the appearance of Tampa's neighborhoods by planting trees in neighborhoods and parks during FY08 as part of the Community Tree Planting Program.

Task

- | | |
|---------|--|
| 1.3.c.1 | Compile & promote list of eligible planting locations citywide. Target specific neighborhoods and available planting locations in conjunction with the 2008 Urban Ecological Analysis and Urban Forest Masterplan. |
| 1.3.c.2 | Promote program through Urban forestry web page (neighborhood ROW trees) and auto application as well as neighborhood outreach and meetings. |
| 1.3.c.3 | Retrieve applicant information from message center, phone inquiries and on-line applications. |
| 1.3.c.4 | Evaluate site locations for appropriateness according to Best Management Practices and the Urban Forest Steering Committee Goals and Strategies. |
| 1.3.c.5 | Schedule contractor and provide list and routing information. |
| 1.3.c.6 | Coordinate watering needs with citizens receiving trees. |
| 1.3.c.8 | Meet with Budget office to review program and funding requests through the Tree Trust Fund. |



Urban Forestry

The following are some statistics on just how important trees are in a City setting.

"The net cooling effect of a young, healthy tree is equivalent to ten room-size air conditioners operating 20 hours a day."—U.S. Department of Agriculture

"Landscaping can reduce air conditioning costs by up to 50 percent, by shading the windows and walls of a home." — American Public Power Association

"If you plant a tree today on the west side of your home, in 5 years your energy bills should be 3% less. In 15 years the savings will be nearly 12%." —Dr. E. Greg McPherson, Center for Urban Forest Research

"A mature tree can often have an appraised value of between \$1,000 and \$10,000." —Council of Tree and Landscape Appraisers

Trees aid in traffic control, they separate pedestrians and vehicles, providing safer walking condition.- Mid-Columbia Community Forestry Council

Objective 38.27. The City of Tampa will maximize the retention and enhancement of the City's mature native shade tree canopy for the environmental value and for the contribution to this City's quality of life.

Policy 38.27.1. The City will seek to maintain and increase environmentally beneficial plant life.

Policy 38.27.2. The City will develop a "greening" program with a goal of increasing tree cover in areas of concentrated vehicular use where the urban heat island effect could be mitigated through planting trees and shrubs.

Policy 38.27.3. Toward reducing the energy requirements of new buildings, the land development review process will incorporate a review of how trees and shrubs could be oriented on a construction site to reduce cooling loads by taking advantage of evapo-transpiration and shade.

Policy 38.27.4. The City will investigate ways to provide incentives to property owners who use certified arborists to assess the health of and properly trim existing large-trunk trees.

