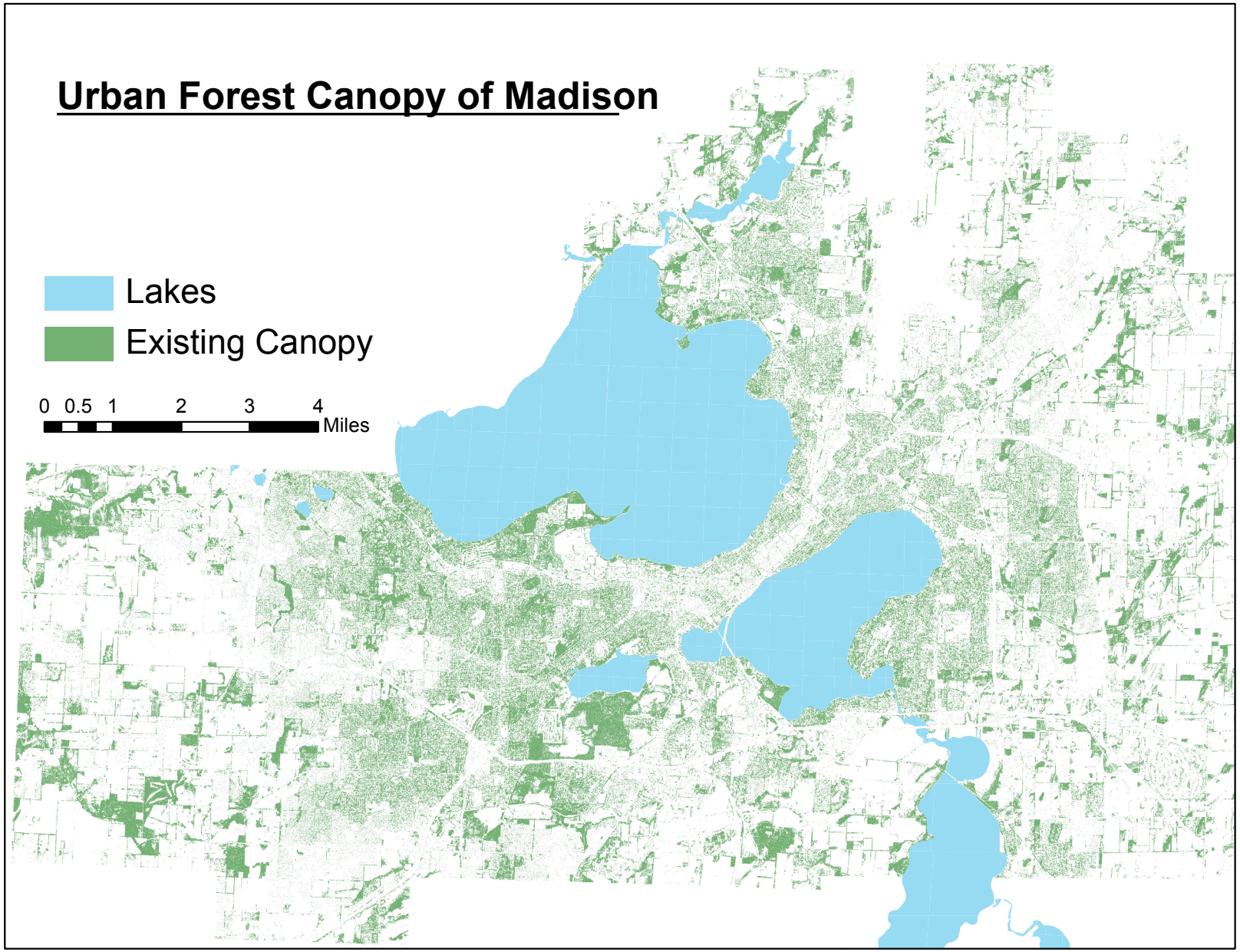
Inventory- kinds of information

- LiDAR- time and data intense, precise
- NAIP- easy to use, coarse
- Aerial Photographs- illustrative
- Statistical Sampling / I-Tree Canopy- doesn't convey location, rather characteristics- field collection and remote sensing

Analysis- interpreting inventory

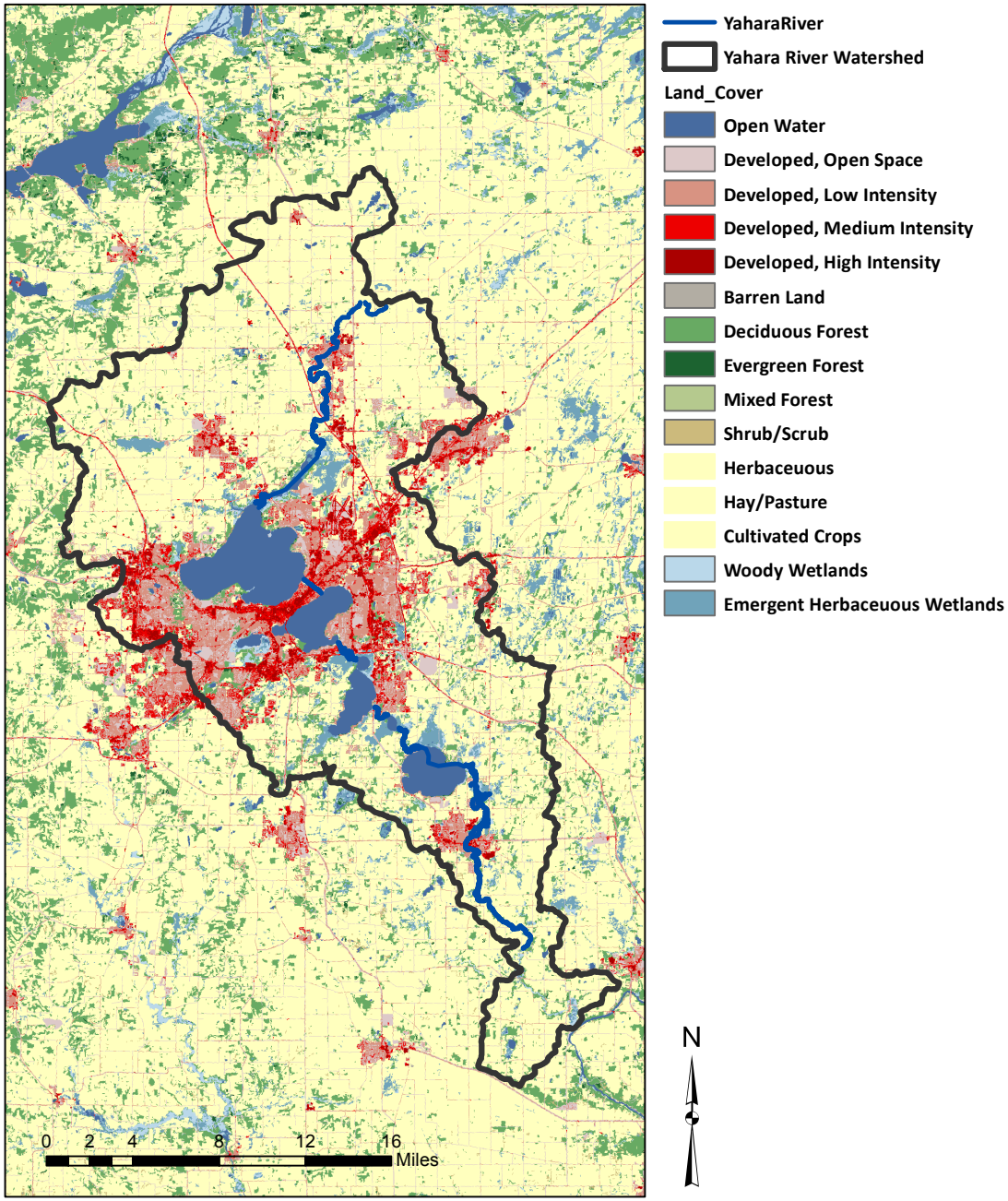
- GIS- overlays
- I-Tree Landscape

LiDAR- Light Detection and Ranging

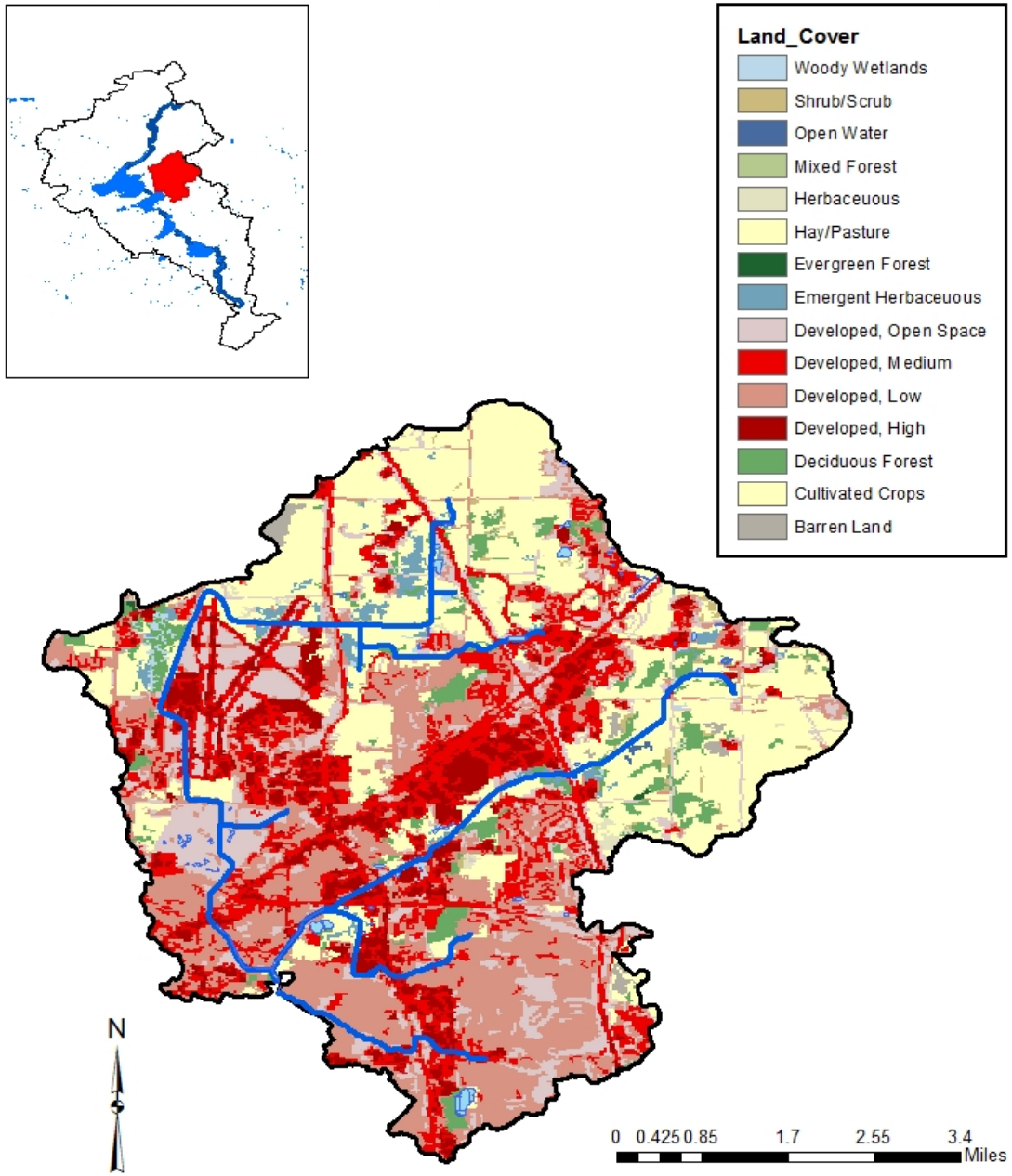


LIDAR- Detail

NAIP – National Agricultural imagery Program

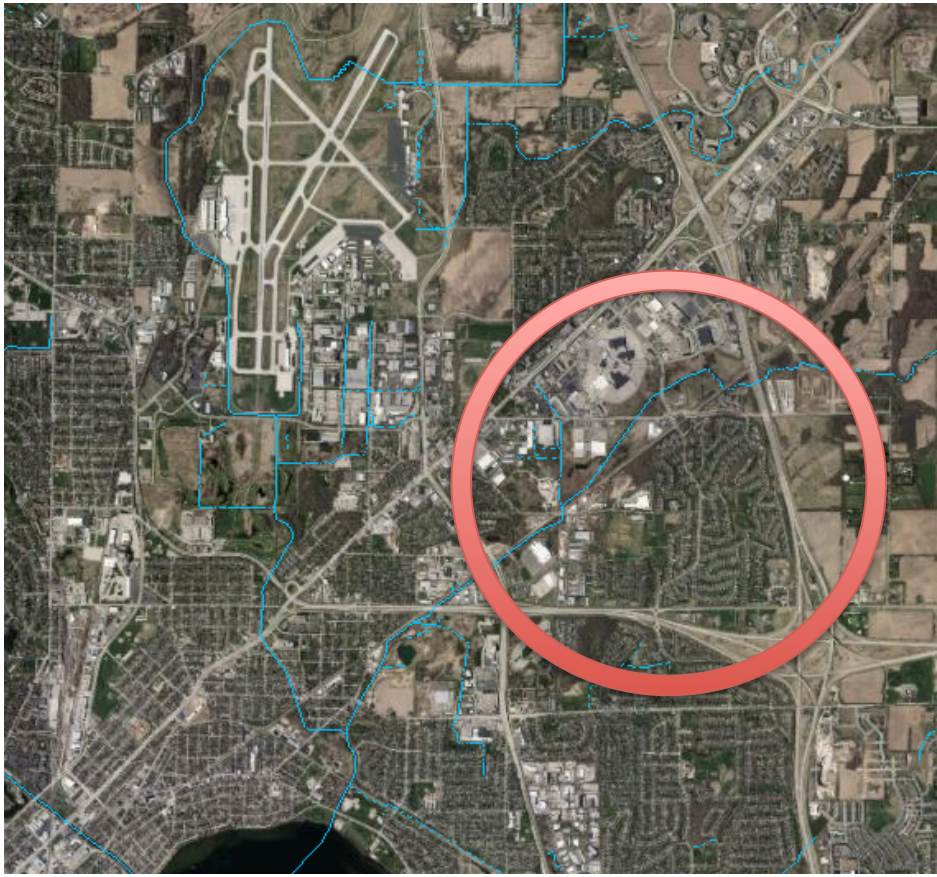


Starkweather Creek

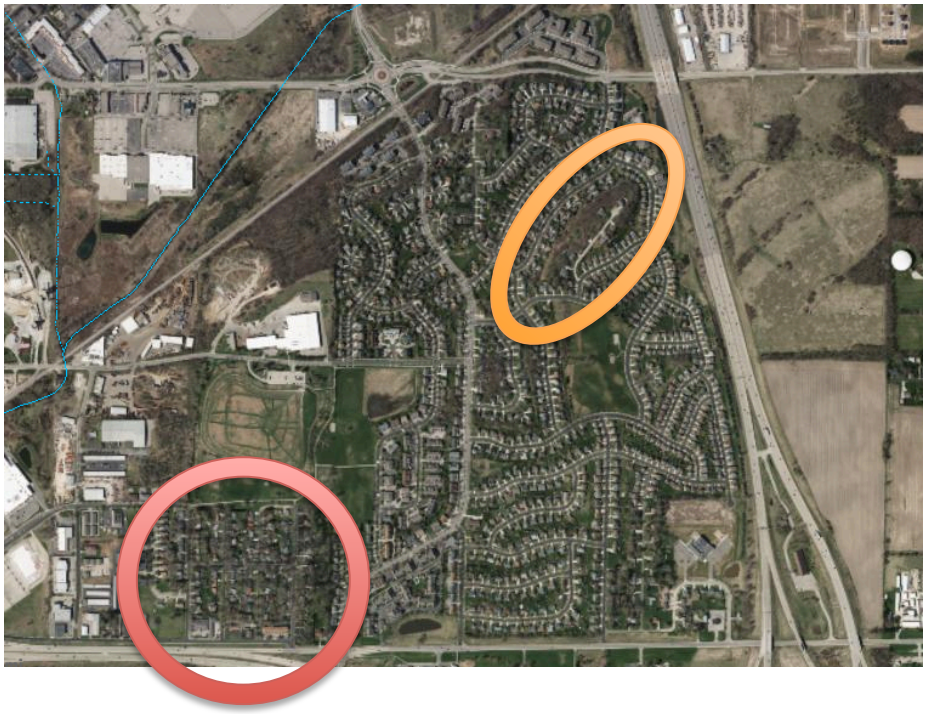


Aerial Photographs

1955



2017



I-Tree Canopy

- With i-Tree Canopy, you review Google Maps aerial photography at random points to conduct a cover assessment within a defined project area.
- You draw your project area boundaries right onto Google Maps or you load an ESRI polygon shapefile in *latitude / longitude coordinates*.
- i-Tree Canopy randomly generates sample points and zooms to each one so you can choose from your pre-defined list of cover types for that spot.
- 500-1000 survey points are suggested; the more points you complete, the better your cover estimate for your study area.
- If estimating tree cover, tree benefits can also be estimated.

i-Tree Canopy v6.1

Estimate tree cover and tree benefits for a given area with a random sampling process that lets you easily classify ground cover types.

Start using i-Tree Canopy:

Step 1 Load ESRI Shapefile ? **or** Define Project Area › ?

Step 2 Configure and Begin Your Survey › ?

Been here before?

Already started an i-Tree Canopy survey?
Load it here and resume your work.

Load Previous i-Tree Canopy Survey ?

Want to compare a completed i-Tree Canopy project to Google Earth historical imagery?

Load Previous i-Tree Canopy Project for Change Survey ?

Would you like to learn more?

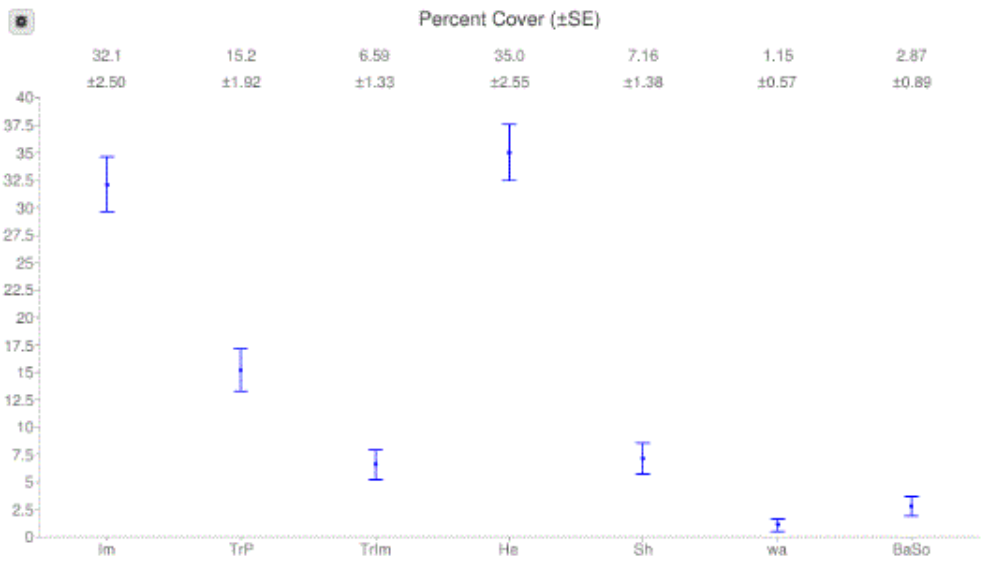
Video Learning Resources

Try Our Sample Project ›

i-Tree Canopy v6.1

Cover Assessment and Tree Benefits Report

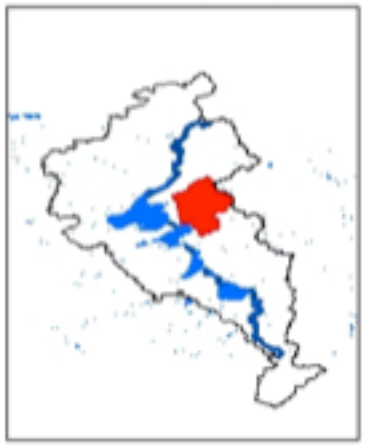
Estimated using random sampling statistics on 10/17/16



Cover Class	Description	Abbr.	Points	% Cover
Impermeable	Paving, roof, gravel	Im	112	32.1 ±2.50
Tree, Permeable	Tree, pervious underneath	TrP	53	15.2 ±1.92
Tree Impermeable	Tree, impervious underneath	Trlm	23	6.59 ±1.33
Herbaceous	Ag.,turf	He	122	35.0 ±2.55
Shrub	Short Veg	Sh	25	7.16 ±1.38
Water	Surface Water, wetland	wa	4	1.15 ±0.57
BareSoil		BaSo	10	2.87 ±0.89

Tree Benefit Estimates

Abbr.	Benefit Description	Value	±SE	Amount	±SE
CO	Carbon Monoxide removed annually	$724.10	±73.46	1,089.85 lb	±110.57
NO2	Nitrogen Dioxide removed annually	$4,245.93	±430.76	11.11 T	±1.13
O3	Ozone removed annually	$120,292.73	±12,203.97	56.89 T	±5.77
PM2.5	Particulate Matter less than 2.5 microns removed annually	$311,023.86	±31,554.08	3.90 T	±0.40
SO2	Sulfur Dioxide removed annually	$234.70	±23.81	1.83 T	±0.19
PM10*	Particulate Matter greater than 2.5 microns and less than 10 microns removed annually	$97,724.93	±9,914.42	15.65 T	±1.59
CO2seq	Carbon Dioxide sequestered annually in trees	$437,636.59	±44,399.23	12,103.00 T	±1,227.88
CO2stor	Carbon Dioxide stored in trees (Note: this benefit is not an annual rate)	$14,957,446.46	±1,517,467.05	413,653.52 T	±41,966.09



Impervious- 32.1% +/-2.5

Tree, Permeable -15.2% +/-1.9

Tree, Impermeable- 6.5%

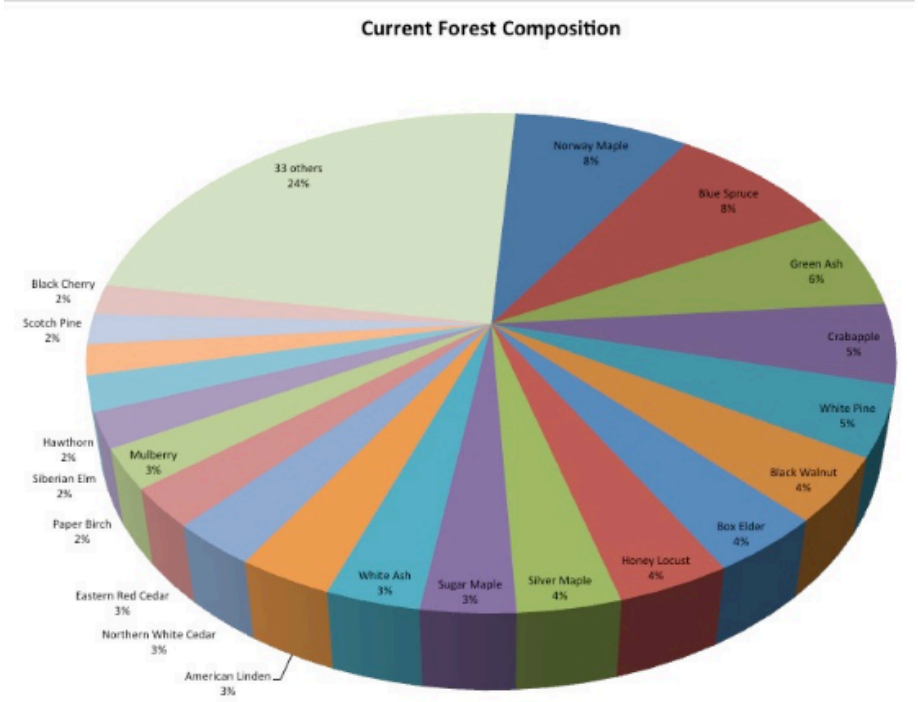
Herbaceous- 35%

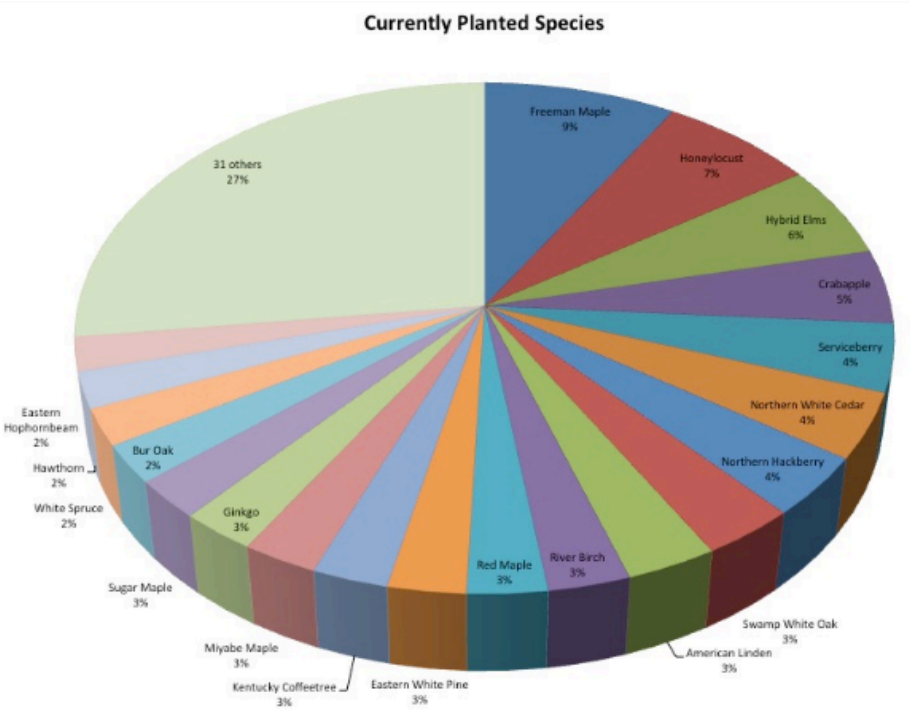
Short Woody- 7.16%

Water- 1.2%

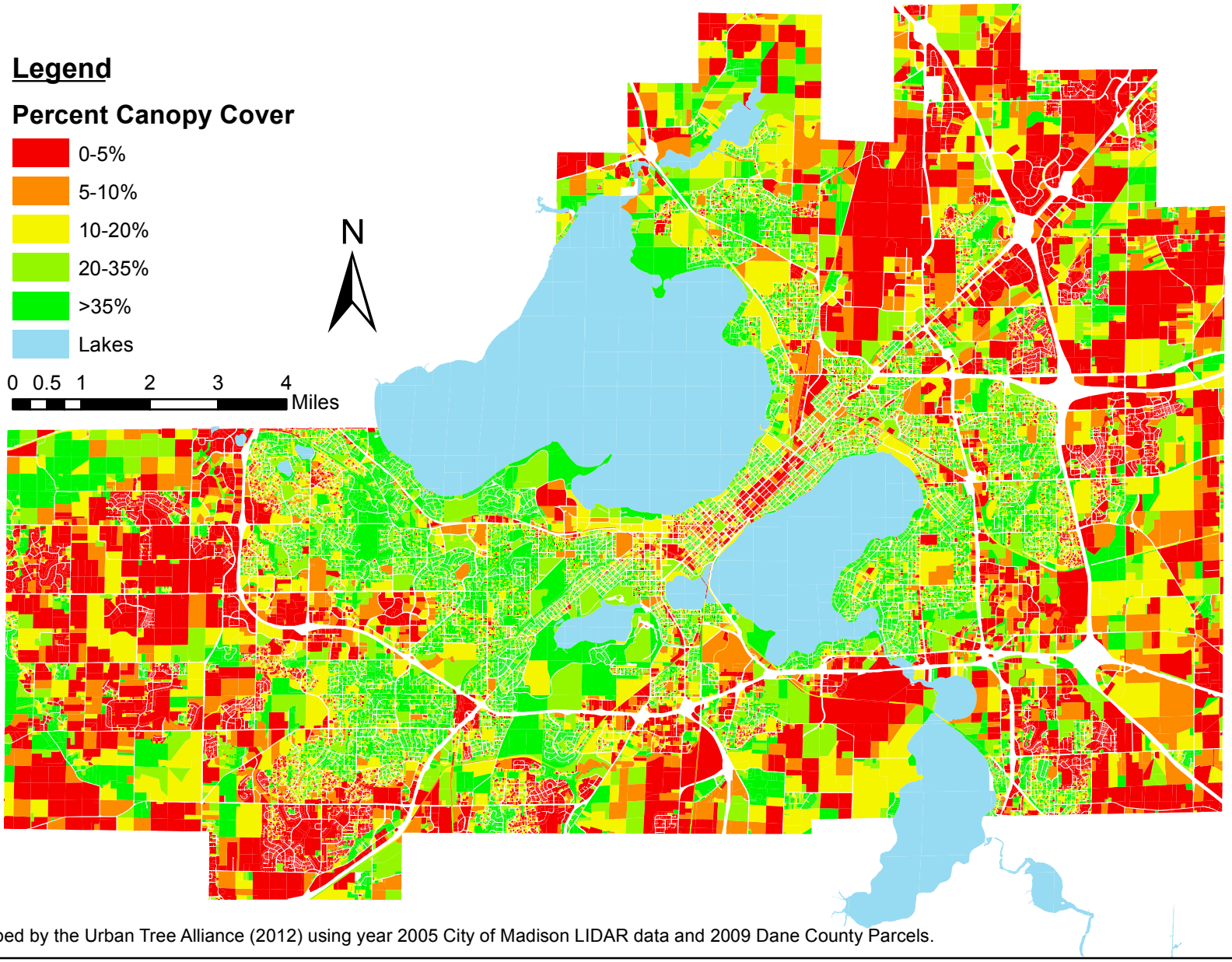
Bare Soil- 2.9%

Species Sampling



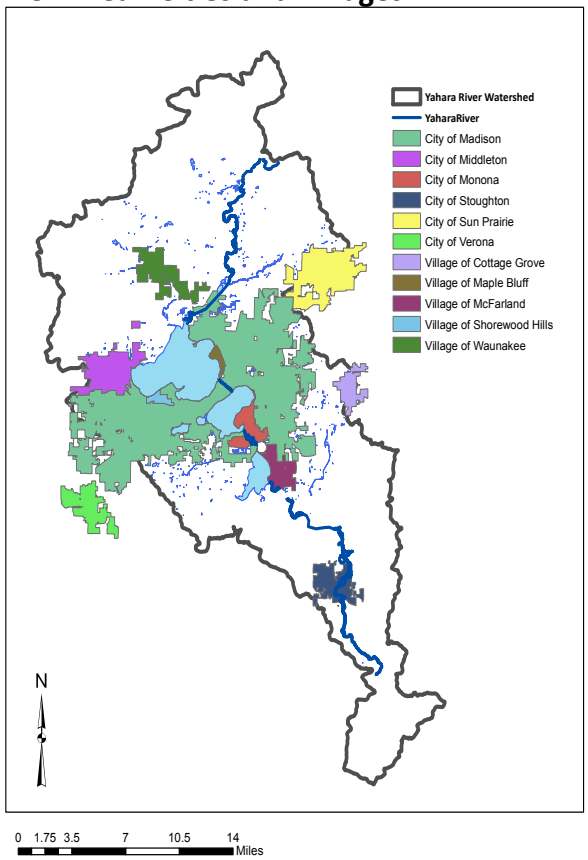


Madison Tree Canopy Cover by Parcel

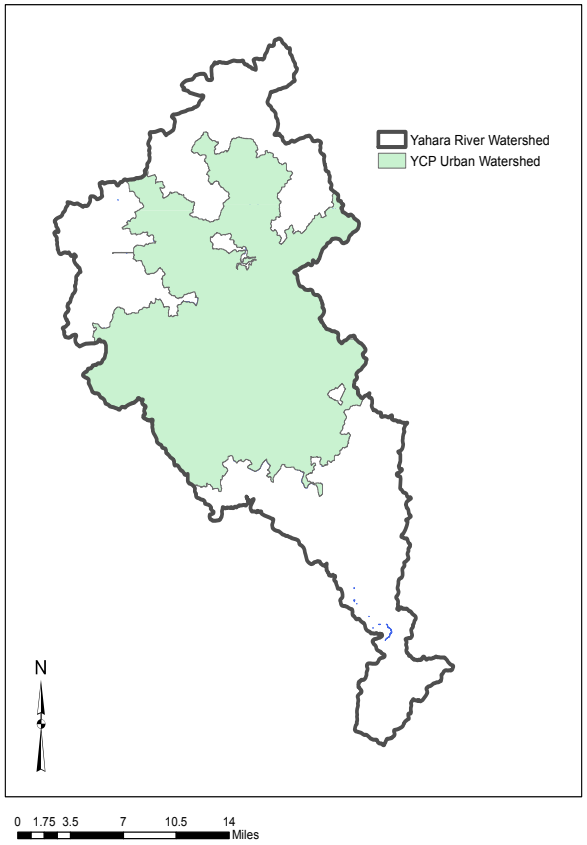


Developed by the Urban Tree Alliance (2012) using year 2005 City of Madison LIDAR data and 2009 Dane County Parcels.

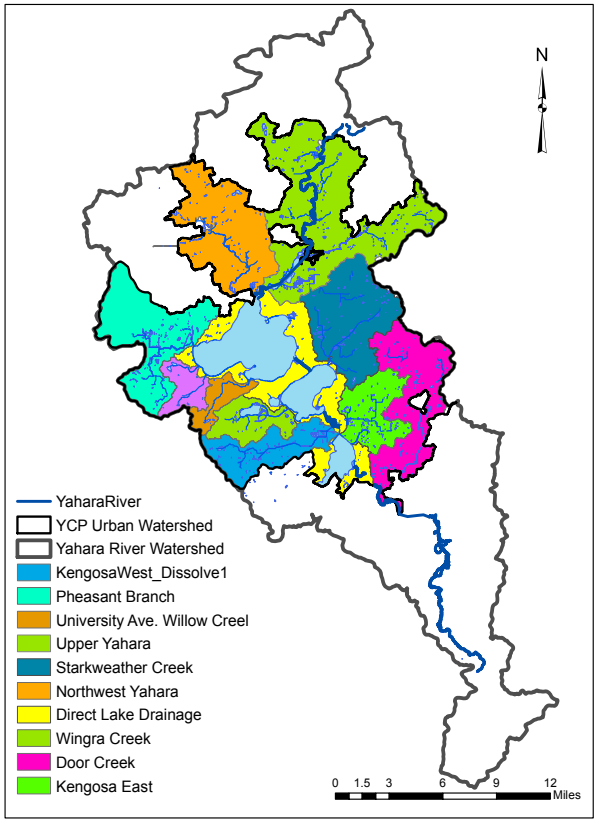
YCP Area - Cities and Villages



YCP- Urban Watershed



YCP- Subwatersheds

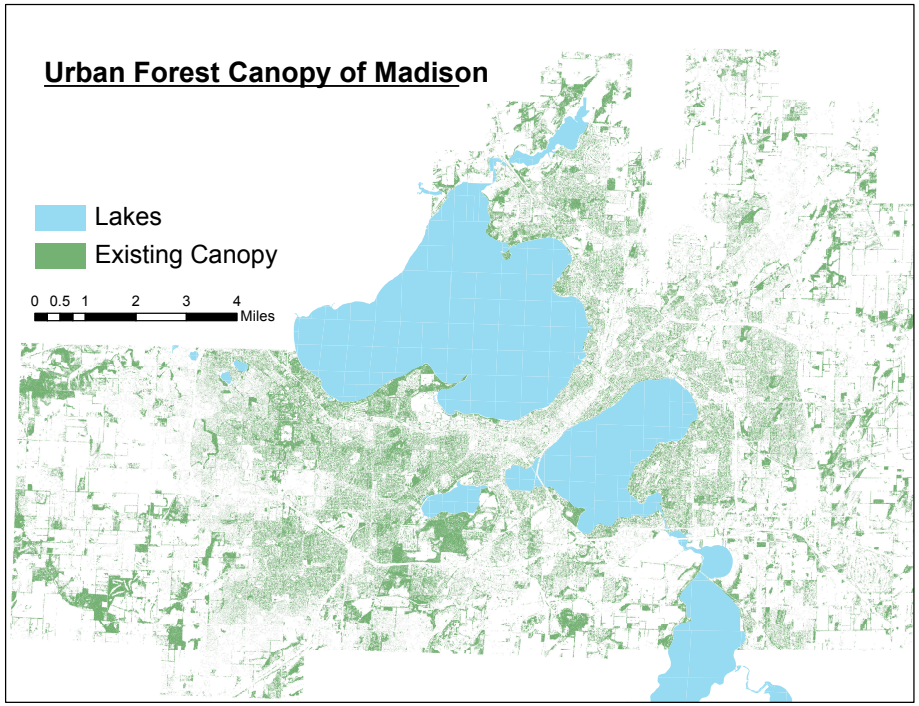


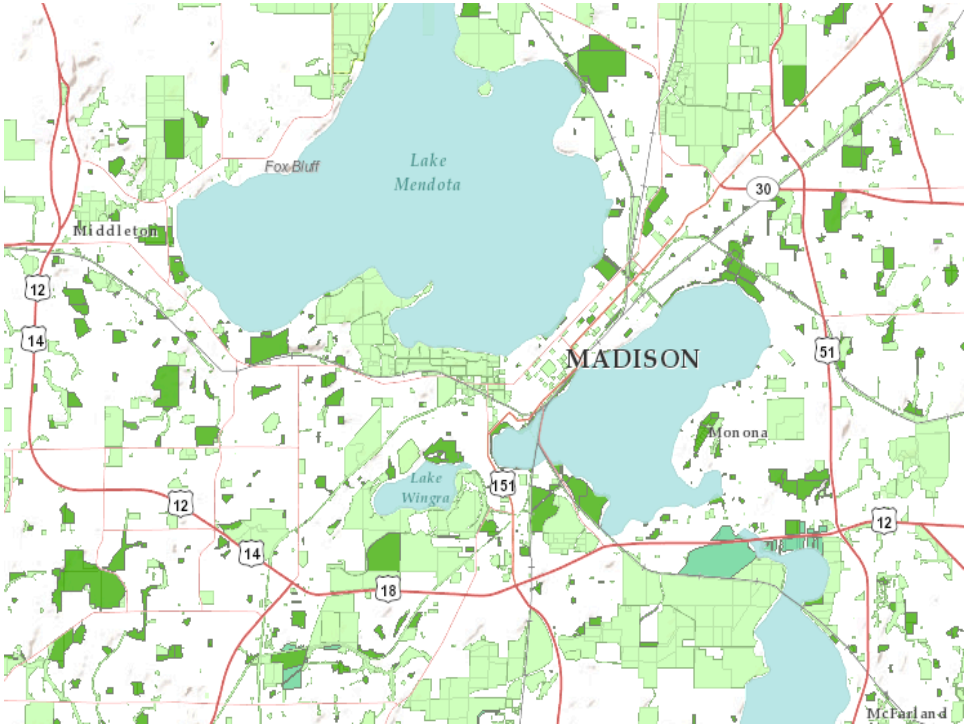
Tree Canopy and Land Use Coverage by Watershed

	(sq.km.)	Im	He	Tr	TrP	TrI	ShVe	W	BSo	~Tr	~LC sub	Tot Run	~Total Run	dif	%	Yrs / Annual Avg	C
Watershed																	
Yahara River*	1,307.94	11.2	53	21.5	17.2	4.2	2.6	11.2	0.5			327,422,323				2005	
										8.5 add	"He-3.5/Im-5"		317,771,029	"-9,651,295"	0.0295		
										5 add							
Yahara Urbanshed	608.65	17.6	46	19.3	14.2	5.1	5.4	10.3	3.3			2,454,455,949				2005-12/306,806,993	
										5 add	"He-2/Im-3"		2,444,577,981.00	"-987,796"	0.0040	305,572,247	
										4 sub	"He+2/Im+2"		2,462,138,868	"+768,293"	0.0031	307,767,358.50	
										100 add			2,102,469,139	"-35,198,681"	0.1434	262,808,642	
Upper Yahara*	300.44	7.9	78.1	9.6	8.5	1.1	0	1	1	5 add		68,842,887	68,248,215	"-594,674"	0.0086		
Northwest Mendota	119.14	9.8	68	13.5	13.1	0.4	6	2.5	0.2	5 add		81,832,868	81,298,293	"-534,653"	0.0065		
Starkweather Creek	62.16	32.5	35	21.5	15.2	6.3	7	1	3	5 add		85,118,760	84,321,760	"-797,000"	0.0093		
Pheasant Branch Creek*	67.34	14	58	18	15.1	2.9	8	1.5	0.5	5 add		91,086,547	90,659,881	"-426,666"	0.0046		
Direct Lake Drainage	45	14	12	20	14.2	6.8	6	48	0	5 add		56,273,779	55,166,846	"-1,106,933"	0.0197		
Southwest Mendota	15.54	34	15	39.5	32	7.5	8	2.8	0.7	5 add		10,628,396	10,535,039	"-93,357"	0.0087		
University / Willow Creek	5	37	20	38	25.6	12.4	5	0	0	5 add		9,683,525	9,550,107	"-133,418"	0.0137		
Door Creek	59.57	13	48	20.1	20.1	0	17	1	1	5 add		122,629,963	121,735,157	"-894,806"	0.0072		
Wingra Creek	20.72	31	15	40	32.2	8	6.8	7	0.2	5 add		27,289,717	27,349,776	"+60,059	0.0020		
East Waubesa	13	20	33	24	19.2	4.8	13.5	5.5	4	5 add		17,966,621	17,847,543	"-119,078"	0.0066		
West Waubesa	31.08	26	20	31	28	1	19	3	1	5 add		42,118,652	41,828,875	"-289,777"	0.0069		
												613,471,715					
Sycamore Catchment	0.49	34.5	33.5	28.5	22.5	6	3.5	0	0	5 add		986,559	976,329	"-10,230"	0.0104		

* gauged stream
Im- Impervious,
He- Herbaceous
TrP-Tree, Permeable Underneath
TrI- Tree ImpermeableUnderneath
ShVe- Short Vegetation
W- Water
Bso- Bare Soil
~Tr- Alternative Case Canopy Change, %pt. change
Tot Run- Total Annual Runoff (cu.meters/yr)
~Tot Run- Alternative Case, Total Annual Runoff (cu.meters/yr)
%Run/$Tr- %runoff decline per %increase in canopy
G- Gauge observed v. predicted

Public and Private Canopy





I-Tree Landscape