

Madison Urban Forest Canopy Data

The following data was produced and compiled by the Urban Tree Alliance from 2012-2017. Documents and notes are listed below:

- 1) *Madison Tree Canopy and Land Cover Percentages*- prepared March 2017 using I-Tree Canopy, pg. 2
- 2) *Local Urban Forest Composition* by species, produced in 2012 by surveying 200 sample plots in the Madison Urban Area as defined by census districts, pg. 3
- 3) *Locally Planted Species*, produced in 2012 in collaboration with the UW-Madison by surveying arborists, landscape contractors, landscape architects, urban foresters, and nursery salespeople to find out what they are planting, selling, and recommending. The diagram illustrates the 20 most commonly planted trees and their relative abundances in the Madison Area, pg. 4
- 4) *Canopy Cover by Local Watershed*, produced in 2016 with I-Tree Canopy. Modeled effects of canopy change were produced with I-Tree Hydro, pg. 5
- 5) *Madison Canopy Coverage*, produced in 2012 using 2005 LIDAR data, pg. 6
- 6) *Madison Canopy by Parcel*, produced in 2012 by overlaying 2005 urban forest canopy coverage LIDAR data with 2009 parcels, pg. 7

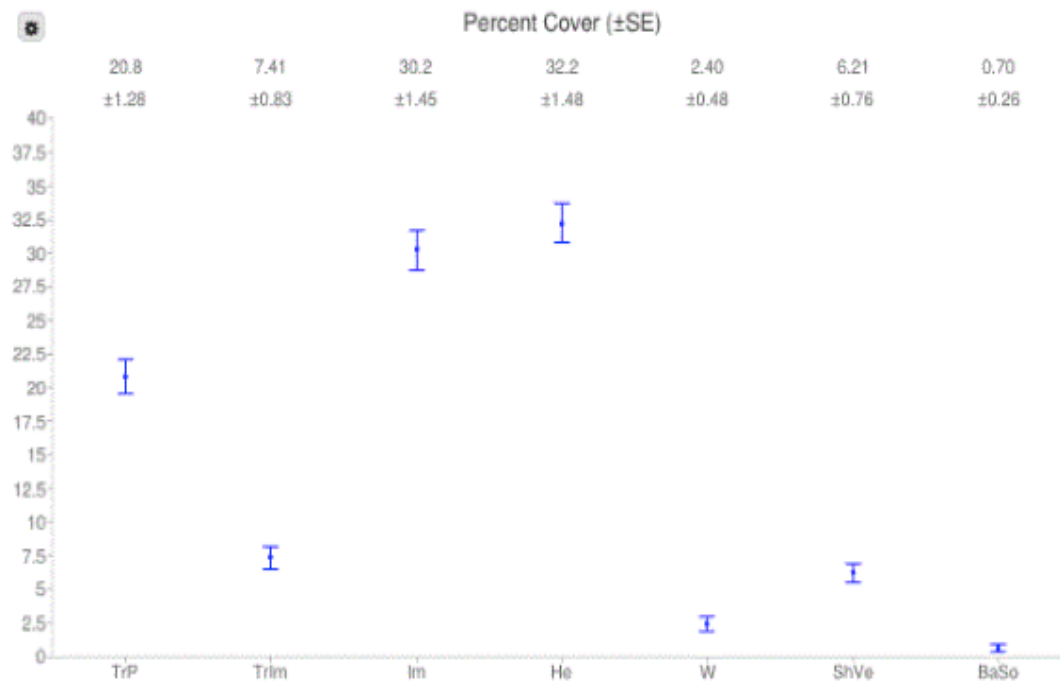
Prepared by the Urban Tree Alliance for the reference of the Madison Urban Forestry Task Force, 6/12/18



i-Tree Canopy v6.1

Cover Assessment and Tree Benefits Report

Estimated using random sampling statistics on 3/20/17

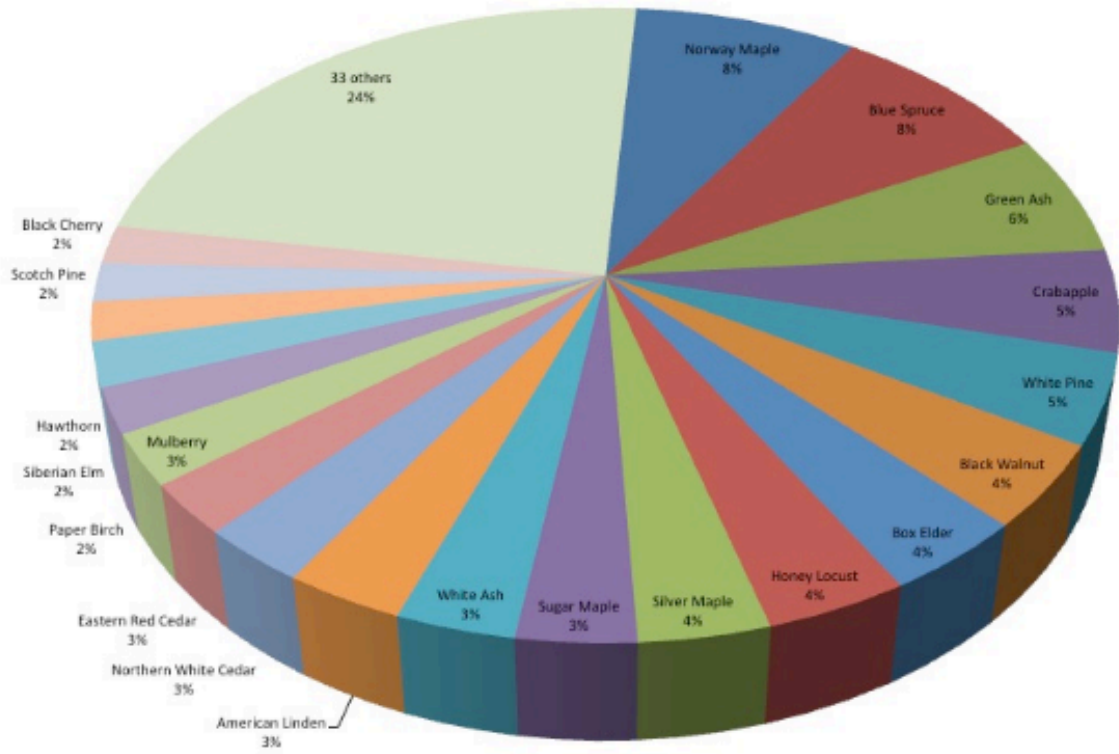


Cover Class	Description	Abbr.	Points	% Cover
Tree, Permeable	Tree, pervious underneath	TrP	208	20.8 \pm 1.28
Tree, Impermeable	Tree, impervious underneath	TrIm	74	7.41 \pm 0.83
Impermeable	Roof, pave, gravel	Im	302	30.2 \pm 1.45
Herbaceous	Ag.,turf	He	322	32.2 \pm 1.48
Water	Surface and wetland	W	24	2.40 \pm 0.48
Short Vegetation	Short woody vegetation	ShVe	62	6.21 \pm 0.76
Bare Soil	Bare Soil	BaSo	7	0.70 \pm 0.26

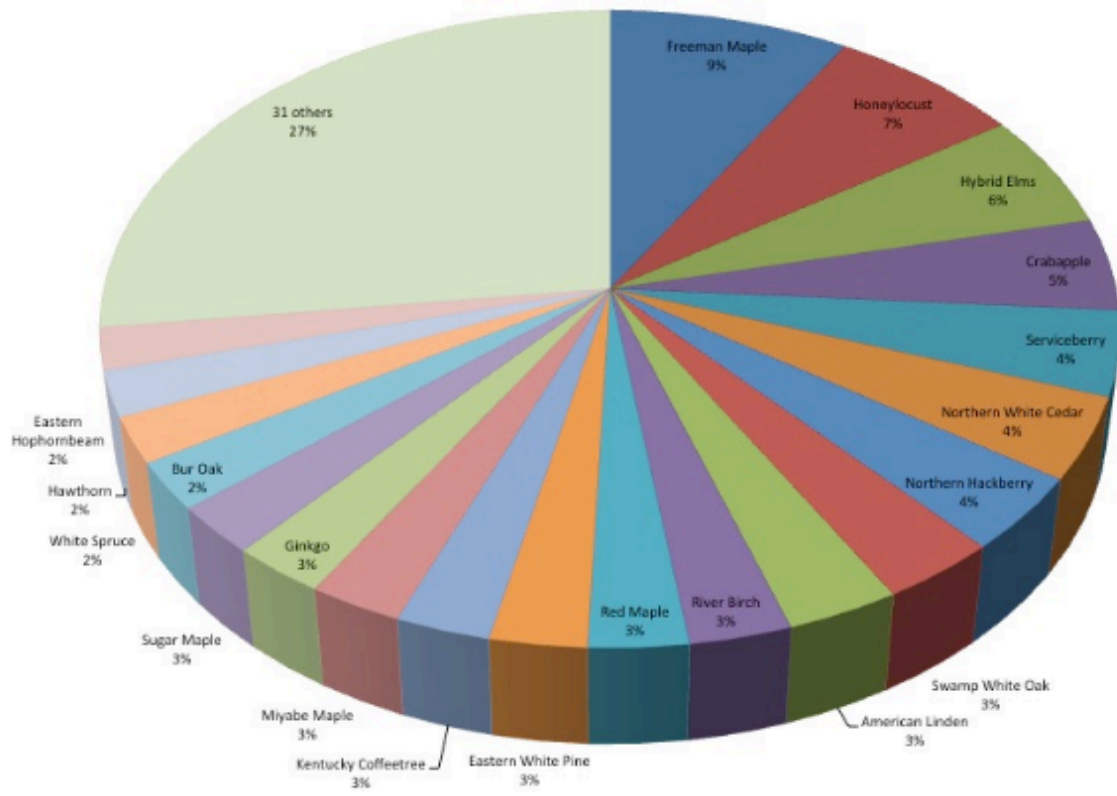
Tree Benefit Estimates

Abbr.	Benefit Description	Value	\pm SE	Amount	\pm SE
CO	Carbon Monoxide removed annually	\$3,120.90	\pm 157.45	2.35 T	\pm 0.12
NO2	Nitrogen Dioxide removed annually	\$18,300.19	\pm 923.23	47.86 T	\pm 2.41
O3	Ozone removed annually	\$518,468.19	\pm 26,156.18	245.20 T	\pm 12.37
PM2.5	Particulate Matter less than 2.5 microns removed annually	\$1,340,529.72	\pm 67,628.34	16.81 T	\pm 0.85
SO2	Sulfur Dioxide removed annually	\$1,011.55	\pm 51.03	7.88 T	\pm 0.40
PM10*	Particulate Matter greater than 2.5 microns and less than 10 microns removed annually	\$421,109.74	\pm 21,249.09	67.43 T	\pm 3.40
CO2seq	Carbon Dioxide sequestered annually in trees	\$1,839,081.55	\pm 92,779.76	52,164.57 T	\pm 2,631.65
CO2stor	Carbon Dioxide stored in trees (Note: this benefit is not an annual rate)	\$62,855,721.50	\pm 3,171,008.23	1,782,889.13 T	\pm 89,943.91

Current Forest Composition



Currently Planted Species



	(sq.km.)	Im	He	Tr	TrP	TrI	ShVe	W	BSo	~Tr	~LC sub	Tot Run	~Total Run	dif	%	Yrs / Annual Avg
Watershed																
Yahara River*	1,307.94	11.2	53	21.5	17.2	4.2	2.6	11.2	0.5	8.5 add	"He-3.5/lm-5"	327,422,323	317,771,029	"-9,651,295"	0.0295	2005
										5 add						
Yahara Urbanshed	608.65	17.6	46	19.3	14.2	5.1	5.4	10.3	3.3	5 add		2,454,455,949				2005-12/306,806,993
										4 sub	"He+2/lm+2"		2,444,577,981.00	"-987,796"	0.0040	305,572,247
										100 add			2,462,138,868	"+768,293"	0.0031	307,767,358.50
Upper Yahara*	300.44	7.9	78.1	9.6	8.5	1.1	0	1	1	5 add		68,842,887	2,102,469,139	"-35,198,681"	0.1434	262,808,642
Northwest Mendota	119.14	9.8	68	13.5	13.1	0.4	6	2.5	0.2	5 add		81,832,868	68,248,215	"-594,674"	0.0086	
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

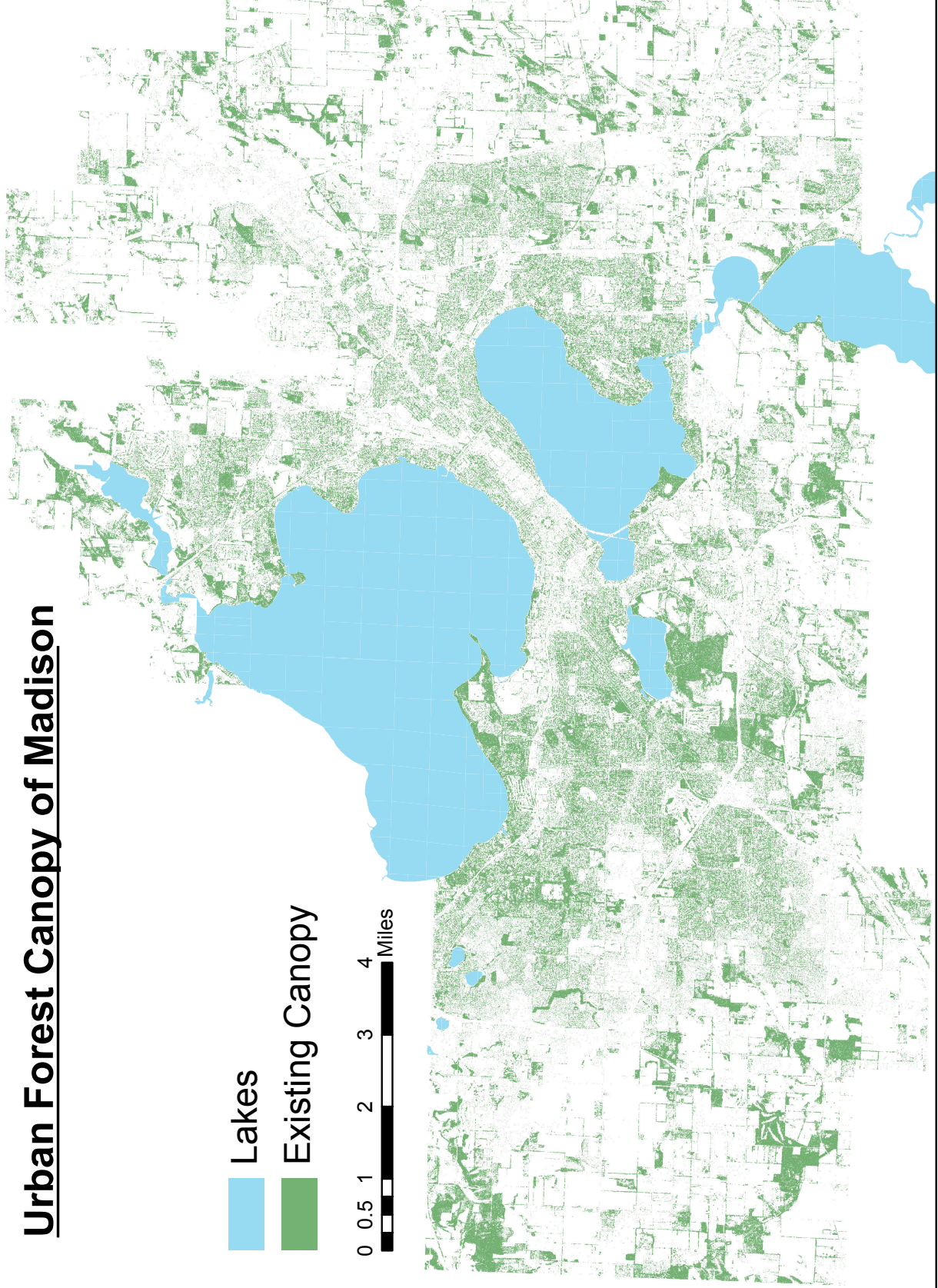
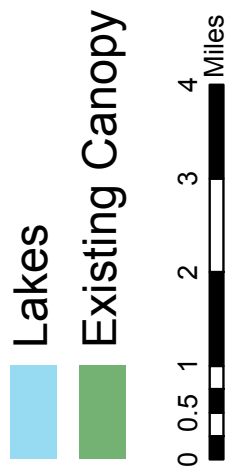
Tot Run- Total Annual Runoff (cu.meters/yr)

~Tot Run- Alternative Case, Total Annual Runoff (cu.meters/yr)

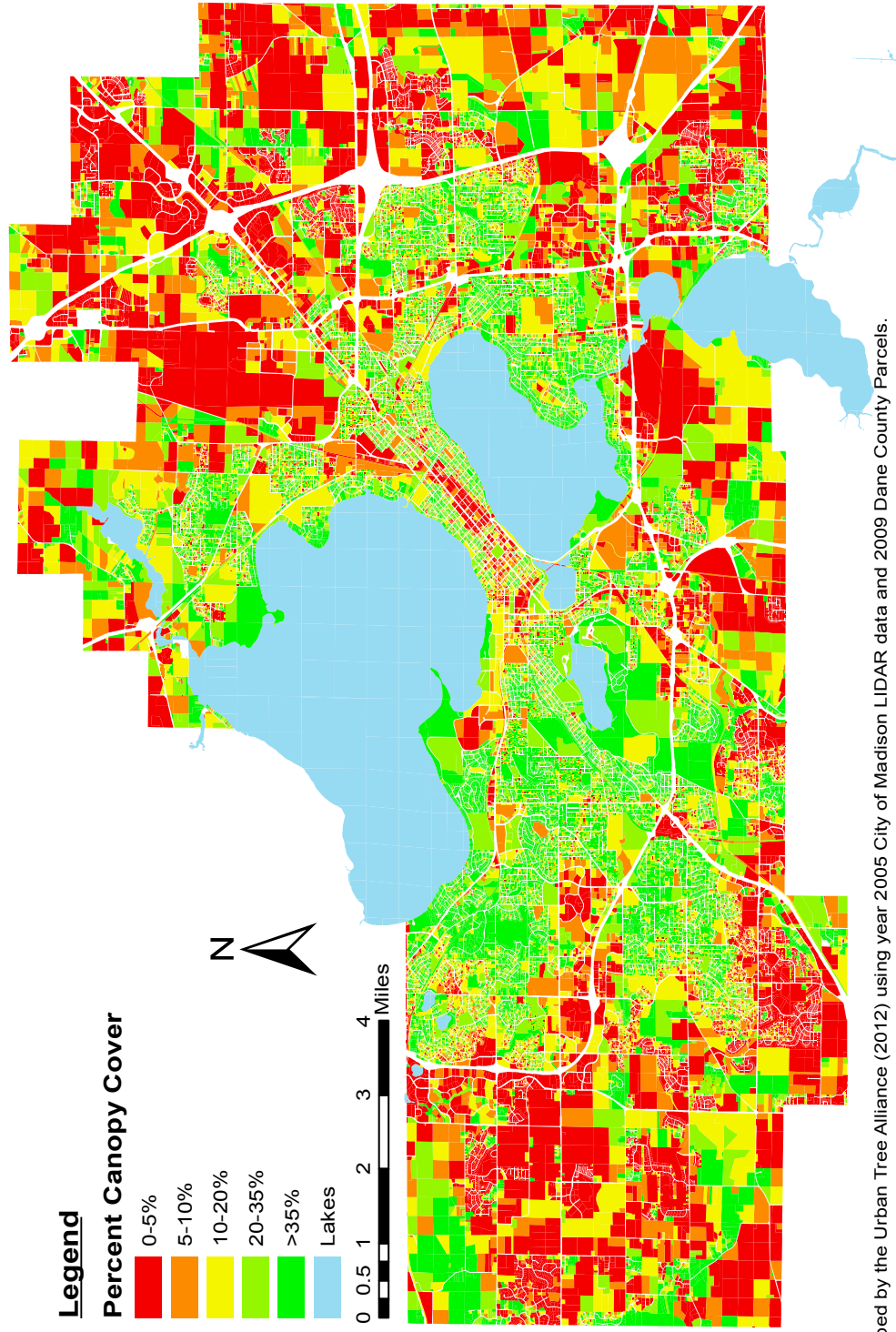
%Run/\$Tr- %runoff decline per %increase in canopy

G- Gauge observed v. predicted

Urban Forest Canopy of Madison



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.