Regreen Springfield in partnership with the US Forest Service:

i-Tree Canopy Assessment

of Springfield Neighborhoods

August 2014

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The Values of Urban Tree Canopy

Urban and community forests can be considered part of the "green infrastructure" that complements our grey infrastructure and should be managed with equal importance. Urban tree canopy assessments can help a community determine how much of their land

area is covered by trees, location of those trees and where there are new opportunities to plant trees. UTC assessments also determine the amount and location of impervious cover in a community. The power of an UTC assessment is the GIS framework where it resides. Canopy cover can be assessed by watershed, zoning or land use category, political boundary, neighborhood, business district, census tract or individual parcel. Results of analyses focus on specific community needs and provide a blueprint of available and unavailable planting opportunities.

A community needs to determine available resources prior to conducting a UTC assessment. Remotely sensed sub-meter resolution digital imagery is necessary as well as technical expertise to process and analyze the data. Imagery and analysis can be expensive so smaller communities should work with state and federal entities to leverage resources or acquire available grants. However, analysis may be equally expensive depending on the level of land cover information sought.

There are two primary ways of assessing the structure or composition of the urban forest: 1) a top-down approach, which involves aerial

assessments of canopy cover, and 2) a bottom-up approach, which involves collecting field data on tree species composition and physical attributes of the vegetation. The top-down approach can be relatively easy and quite accurate, but is limited to measuring the quantity and distribution of canopy layers. The bottom-up approach involves collecting field vegetation data in the field on the vegetation and may provide more detailed information needed to assess urban forest structure and ecosystem services, and to aid in urban forest management e.g., species composition, number of trees tree locations, tree sizes and tree health). Specialized software tools developed by the U.S. Forest Service such as the i-Tree suite (Eco, Streets and Hydro) are available at no cost.

i-Tree Tools for Analysis

About this Study

The tree canopy cover in the seventeen neighborhoods of Springfield, Massachusetts was examined in this study, and a summary of the percent tree canopy within each community was established, using i-Tree Canopy. Additionally, the area of tree canopy, in acres in each neighborhood was determined using the i-Tree toolkit. This study, completed in January, 2014 provides the City Forestry Division with a baseline measure of Springfield's tree canopy, as it moves toward establishing tree canopy goals for the next decade. Additionally, the comparison of neighborhood tree cover provides useful information that will assist

i-Tree Software Toolkit

i-Tree is a state-of-the-art, peer-reviewed software suite from the US Forest Service that provides urban and community forestry analysis and benefits assessment tools. The i-Tree tools help communities of all sizes to strengthen their urban forest management and advocacy efforts by quantifying the environmental services that trees provide and the structure of the urban forest.

i-Tree has been used by communities, non-profit organizations, consultants, volunteers, and students to report on the urban forest at all scales from individual trees, parcels, neighborhoods, cities, to entire states. By understanding the local, tangible ecosystem services that trees provide, i-Tree users can link urban forest management activities with environmental quality and community livability. Whether your interest is a single tree or an entire forest, i-Tree provides baseline data that you can use to demonstrate value and set priorities for more effective decision-making.

i-Tree Canopy

This i-Tree tool offers a quick and easy way to produce a statistically valid estimate of land cover types (e.g., tree cover) using aerial images available in Google Maps. Canopy can be used by urban forest managers to estimate tree canopy cover, set canopy goals and monitor canopy change over time. Canopy can also be used to estimate inputs for

Tree Canopy Goals

Tree canopy is the layer of leaves, branches, and stems of trees that cover the ground when viewed above. Tree canopy provides many benefits to communities by improving water quality, saving energy, lowering city temperatures, reducing air pollution, enhancing property value, providing wildlife habitat, facilitating social and educational opportunities and providing aesthetic benefits. Establishing a tree canopy goal is crucial aesthetic benefits. Establishing a tree canopy goal is is crucial for communities seeking to improve their green infrastructure and environment quality. A tree canopy assessment is the first step in this goal setting process, providing estimates for the amount of tree canopy currently present in a city as well as the amount of tree canopy that could theoretically be established.

i-Tree Canopy Analysis

Neighborhood	Percent Canopy Cover	Area Cover (Sq.Mi.)
Sixteen Acres	50 (CI = 4.08)	4.04 (CI = 0.33)
Boston Road	44 (CI = 4.05)	1.02 (CI = 0.09)
Forest Park	41.3 (CI = 4.02)	1.45 (CI = 0.14)
East Forest Park	30.7 (CI = 3.76)	0.86 (CI = 0.11)
Indian Orchard	30.2 (CI = 3.76)	0.77 (CI = 0.1)
Pine Point	29.3 (CI = 3.72)	0.71 (CI = 0.71)
Liberty Heights	28 (CI = 3.61)	0.77 (CI = 0.1)
Bay	26.7 (CI = 3.61)	.29 (CI = 0.04)
Brightwood	20 (CI = 3.27)	0.13 (CI = 0.02)
East Springfield	17.3 (CI = 3.09)	0.54 (CI = 0.1)

CI denotes Confidence Interval

Forest Park, is a Victorian garden district located in Springfield, Massachusetts, developed between 1880 and 1920. It is the city's most populous neighborhood, and surrounds the 735-acre Frederick Law Olmsted-designed Forest Park. The Forest Park neighborhood has nature and recreation within walking distance. It contains 2,103 acres of land, 41% of which is conservation or parkland. A 195-acre section of the neighborhood was listed on the National Register of Historic Places in 1982 as the Forest Park Heights Historic District.The 600-house Forest Park Heights Historic District was developed between 1890 and 1910, and includes gracious Colonial Revival, Tudor Revival, Queen Anne, and Shingle Style homes.The ruggedly contoured valley of Pecousic Brook occupies more than half of the south side of the Forest Park. This area has been left largely Naturalist in style, although it features many walking trails and a few elegant bridges. It is home to many species of birds and wildlife.

Sixteen Acres, located in the Southeast corner of the city, is Springfield's largest neighborhood at 4,508 acres and with a population of 24,252 people. Sixteen Acres includes Western New England University, the SABIS International High School, Pioneer Valley Christian Academy, and the Veterans Memorial Golf 18-hole, streets of newer Course. Besides ranches, colonials, split-levels, and capes, the neighborhood has large condominium complexes on Nassau Drive. Sixteen Acres also features the 28-acre Greenleaf Park, a recently expanded branch library, and two private beach clubs. Commercial clusters on Wilbraham Road and Allen Street provide convenient shopping, including the recently opened Fresh Acres Market. Sixteen Acres residents have a quick drive to East Longmeadow's employers, such as Hasbro and American Saw.

Boston Road is Springfield, Massachusetts's principal commercial and retail corridor. It is a medium-sized Springfield neighborhood, containing 727 acres plus rights-of-way and water bodies. Principal boundaries are the Boston & Albany Railroad to the north; the North Branch of the Mill River to the south; the Town of Wilbraham to the east; and Cobb and Methuen Streets to the west. Boston Road remains a commercial stronghold, home to the fully occupied Eastfield Mall, various big box stores, a movie theater, and a branch of Hampden Bank. Just across from the above mentioned Hampden Bank, Springfield city parks including Five Mile Pond and Loon Pond provide places to swim, fish, boat, and picnic. The High School of Science & Technology Putnam Vocational High School are located in this neighborhood

Neighborhood	Percent Canopy Cover	Area Cover (Sq.Mi.)
Old Hill	15.9 (CI = 2.98)	0.08 (CI = 0.02)
South End	13.3 (CI = 2.78)	0.06 (CI = 0.01)
Indian Orchard	30.2 (CI = 3.76)	0.77 (CI = 0.1)
Six Corners	13.3 (CI = 2.78)	0.07 (CI = 0.02)
Upper Hill	12.0 (CI = 2.65)	0.08 (CI = 0.02)
McKnight	11.4 (CI = 2.6)	0.07 (CI = 0.02)
Memorial Square	9.3 (CI = 2.38)	0.05 (CI = 0.01)
Metro Center	6.7 (CI = 2.04)	0.06 (CI = 0.06)

CI denotes Confidence Interval

Indian Orchard is a neighborhood in the City of Springfield, Massachusetts. It is located in the northeastern corner of the city. Containing 1,251 acres plus rights of way and water bodies, it is the fifth largest of Springfield's seventeen neighborhoods. Indian Orchard began in the 1840s as an isolated mill town and has preserved its identity over the years, even after becoming more fully encompassed by "The City of Firsts." One of Indian Orchard's former mills is now a large artists' studio space; this has been the catalyst for the neighborhood's growing arts & crafts scene. The Indian Orchard Mills/ Dane Gallery hosts an artists' open house twice a year. Hubbard Park is a major source of recreational activities. The newly expanded Indian Orchard branch of the Springfield Library offers adult and family activities. The neighborhood is also home to Lake Lorraine State Park, a public swimming beach.

Metro Center is the original colonial settlement of Springfield, Massachusetts, located beside a bend in the Connecticut River. As of 2011, Metro Center features a majority of Western Massachusetts' most important cultural, business, and civic venues. In recent years, it has become an increasingly popular residential district, especially among young professionals, empty-nesters, and creative types, with a population of approximately 7,000 (2010.) Metro Center includes approximately 690 acres of land where the city was initially established, founded in 1636 by William Pynchon and a group of pioneers, was originally called Agawam Plantation. The arrival of the railroad to Springfield in the 1830s brought great wealth to the city. Goods from New York, Boston, Chicago, and even as far west as San Francisco travelled through Springfield on their ways to coastal distribution centers. Springfield, rather than Hartford, or Northampton, or Greenfield, became Western New England's railroad hub, perhaps due to the presence of the Springfield Armory, but more likely due to the city's growing reputation for ingenuity, and that it served as a nearly equidistant point between Albany and Boston, Providence, and New York.

i-Tree Canopy Analysis

The McKnight National Register Historic District in Springfield, Massachusetts is known worldwide to urban-planners as the one of the first planned residential neighborhoods in the United States of America. The neighborhood's 900 ornate homes are part of a district listed on the National Register of Historic Places.Mason Square, formerly Winchester Square, is the commercial heart of the McKnight District. It features a renovated branch library, the original Indian Motorcycle Company building, American International College, and a monument to the first game of basketball placed on the site of the first-ever game, played at the original location of Springfield College.

Liberty Heights comprises smaller Springfield, Massachusetts neighborhoods including Hungry Hill, Lower Liberty Heights, and Atwater Park and is located in the northwest quadrant of the city. It contains 1,384 acres and is the fifth largest of Springfield's seventeen neighborhoods. Liberty Heights is a residential neighborhood full of a variety of 20th century housing types, such as: Craftsman, Colonial Revival, Tudor Revival, Capes, and Ranches. Liberty Heights is partly home to Van Horne Park, one of the city's largest public parks, the Liberty Plaza shopping center, and some of the city's largest employers, such as Baystate Medical Center and Smith & Wesson. The Liberty Heights neighborhoods are also close to Elms College in Chicopee.

The Bay neighborhood is located in Springfield, Massachusetts, near the city's geographic center, approximately two miles east of Metro Center, Springfield, Massachusetts. It contains 556 acres of land, plus streets and railroads. Bay is one of the smallest of the city's seventeen neighborhoods. Bay is one of the most racially diverse Springfield neighborhoods, featuring large numbers of African Americans, Hispanics, and Whites.

Finding Additional Resources on Urban Tree Canopy Cover

The following links provide useful information on Urban Tree Canopy (UTC) assessments and how they can help you analyze trees in your community —

i-Tree Canopy Software Toolkit
www.itreetools.org/canopy

US Forest Service UTC Homepage
http://www.nrs.fs.fed.us/urban/utc/

University of Vermont
www.itreetools.org/canopy

National Association of State Foresters
http://www.stateforesters.org/urban_forest_canopy_cover_primer

UTC video from US Forest Service
http://www.nrs.fs.fed.us/urban/utc/about/

UTC Bibliography from US Forest Service
http://www.nrs.fs.fed.us/urban/utc/pubs/

ReGreenSpringfield

www.regreenspringfield.org

i-Tree Canopy | Regreen Springfield | US Forest Service

Photography by Mick Normoyle
http://www.flickr.com/photos/mick3b1g/5707871657/

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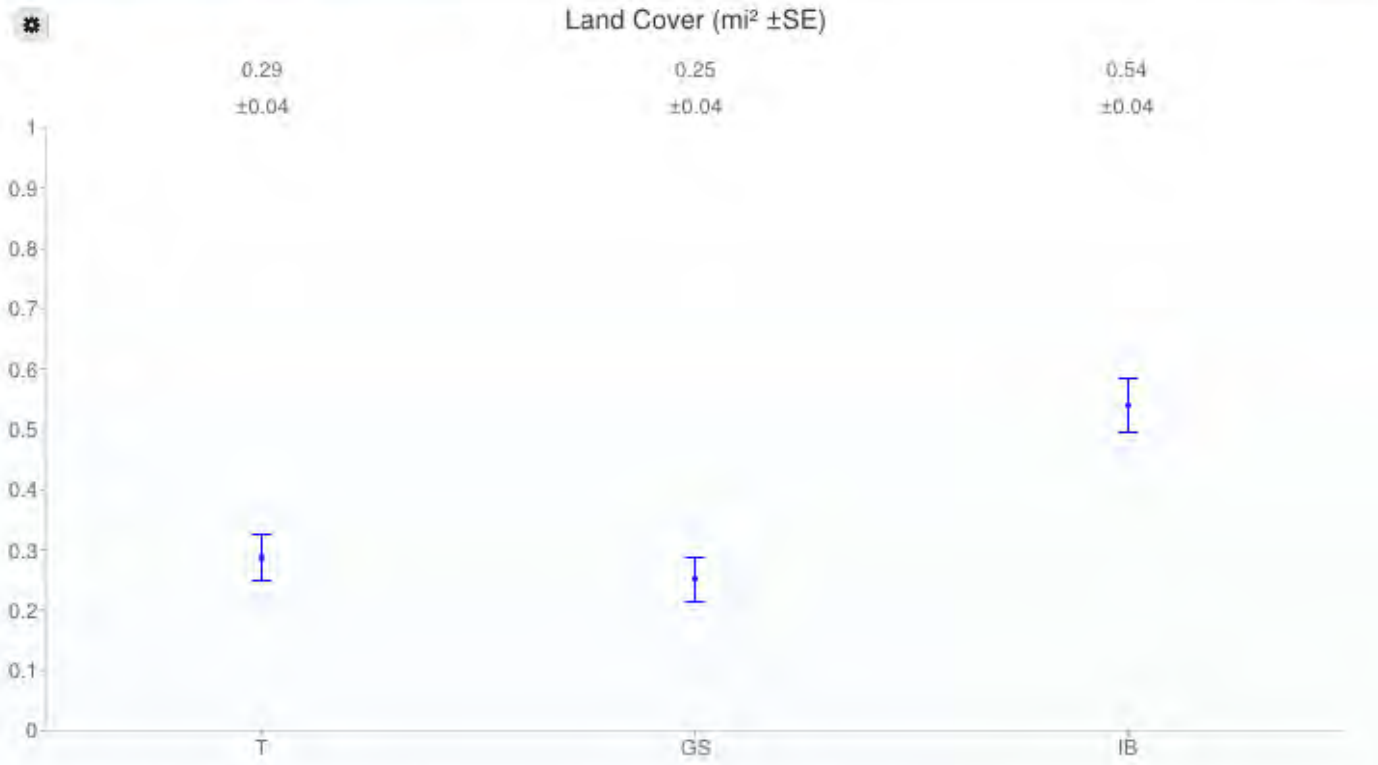
iTree Canopy Assessment

Bay Neighborhood - By Area

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	Land Cover
Tree	Tree, non-shrub	T	40	0.29 ±0.04
Grass and Shrubs	Grass and Shrubs	GS	35	0.25 ±0.04
Impervious Building	Impervious Building	IB	75	0.54 ±0.04

About i-Tree Canopy

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Limitations of i-Tree Canopy

The accuracy of the analysis depends upon the ability of the user to correctly classify each point into its correct class. As the number of points increase, the precision of the estimate will increase as the standard error of the estimate will decrease. If too few points are classified, the standard error will be too high to have any real certainty of the estimate.

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Bay Neighborhood - % Canopy Cover

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Tree	Tree, non-shrub	T	40	0.29 ±0.04
Grass and Shrubs	Grass and Shrubs	GS	35	0.25 ±0.04
Impervious Building	Impervious Building	IB	75	0.54 ±0.04

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Boston Road Neighborhood - By Area

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Cover Report - 1/10/14

Cover Class	Description	Abbr.	Points	Land Cover
Tree	Tree, non-shrub	T	66	1.02 ±0.09
Grass and Shrub	Grass and Shrub	GS	45	0.70 ±0.09
Impervious Building	Impervious Building	IB	39	0.60 ±0.08

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Boston Road Neighborhood - % Canopy Cover

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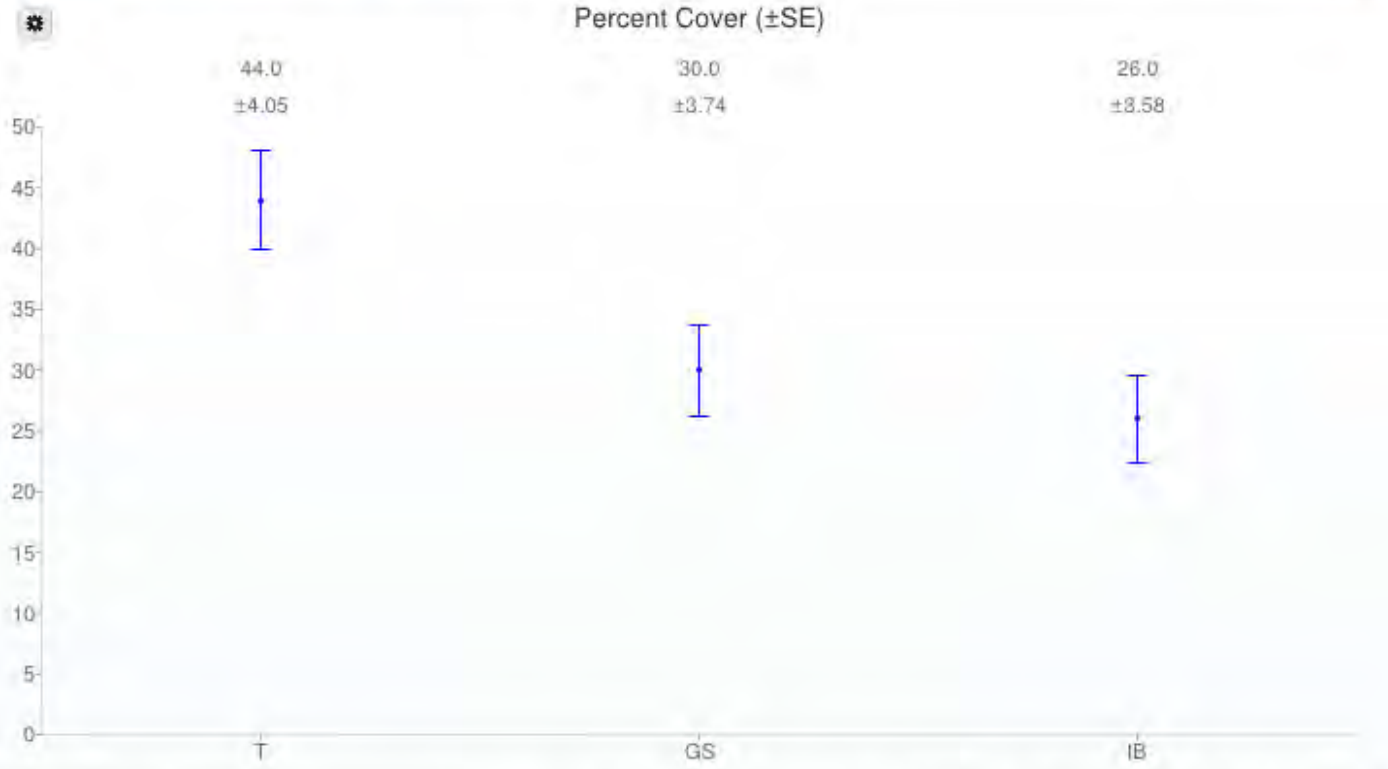
Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	% Cover
Tree	Tree, non-shrub	T	66	44.0 ±4.05
Grass and Shrub	Grass and Shrub	GS	45	30.0 ±3.74
Impervious Building	Impervious Building	IB	39	26.0 ±3.58

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Brightwood Neighborhood - By Area

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Cover Class	Description	Abbr.	Points	Land Cover
Tree	Tree, non-shrub	T	30	0.13 ±0.02
Grass and Shrubs	Grass and Shrubs	GS	54	0.24 ±0.03
Impervious Building	Impervious Building	IB	66	0.29 ±0.03

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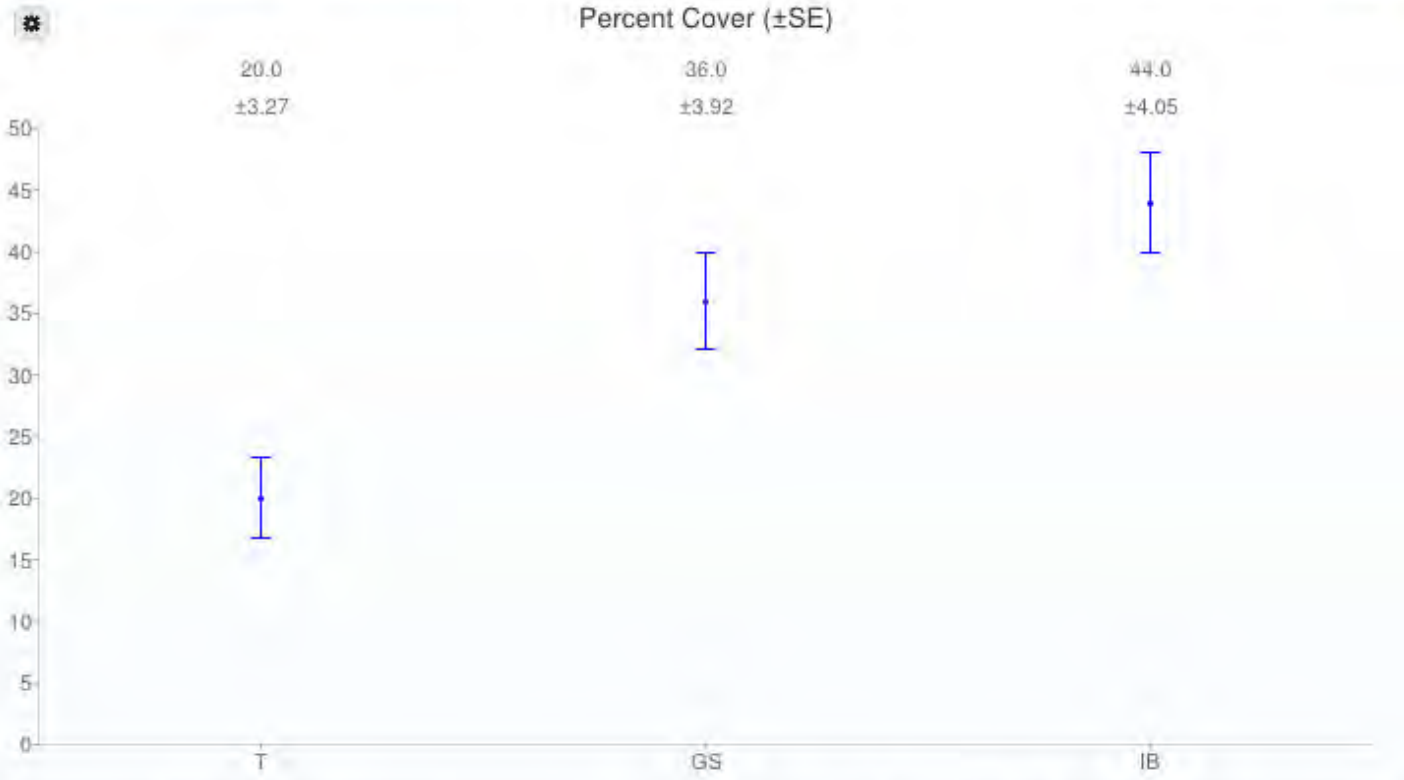
Brightwood Neighborhood - % Canopy Cover

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	% Cover
Tree	Tree, non-shrub	T	30	20.0 ±3.27
Grass and Shrubs	Grass and Shrubs	GS	54	36.0 ±3.92
Impervious Building	Impervious Building	IB	66	44.0 ±4.05

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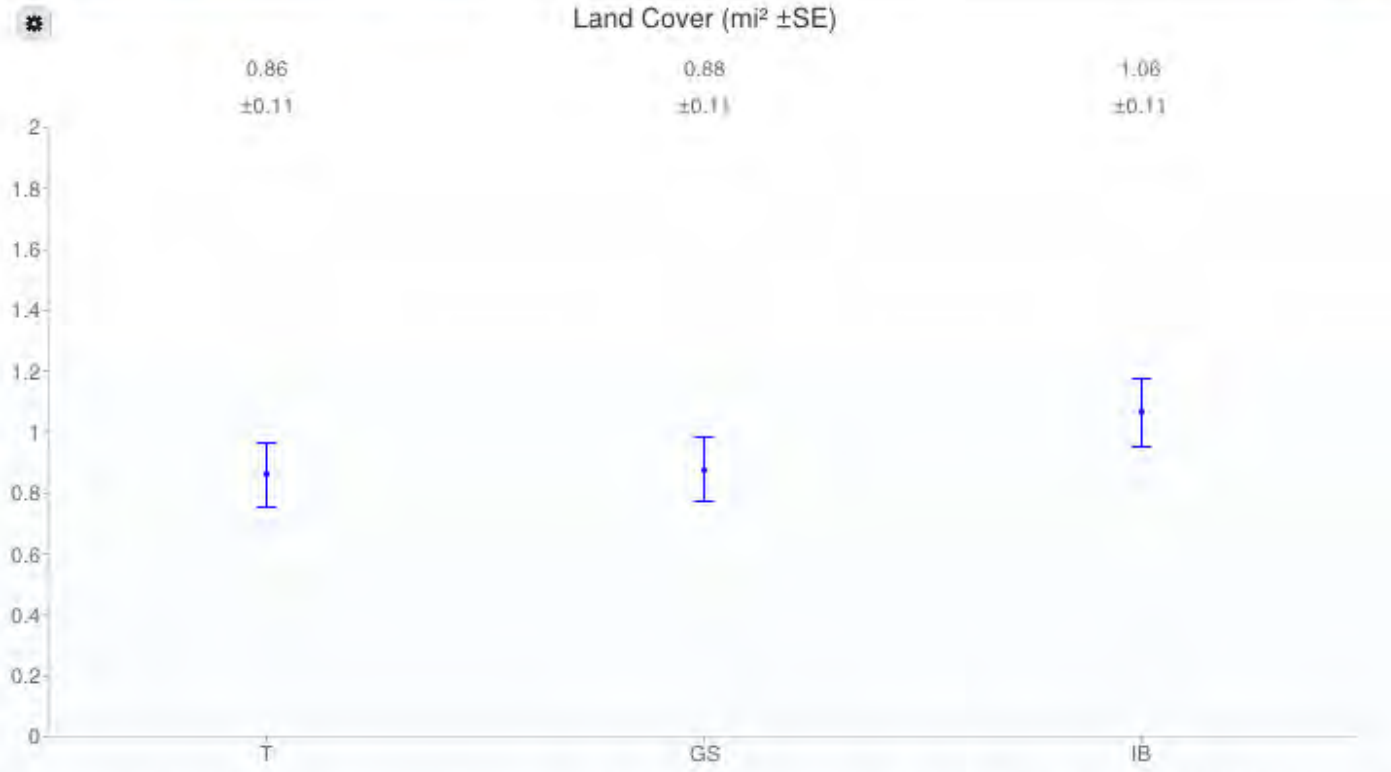
East Forest Park Neighborhood - By Area

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	Land Cover
Tree	Tree, non-shrub	T	46	0.86 ±0.11
Grass and Shrubs	Grass and Shrubs	GS	47	0.88 ±0.11
Impervious Building	Impervious Building	IB	57	1.06 ±0.11

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East Forest Park Neighborhood - % Canopy Cover

i-Tree Canopy v5.1

Cover Report - 1/10/14

Cover Class	Description	Abbr.	Points	% Cover
Tree	Tree, non-shrub	T	46	30.7 ±3.76
Grass and Shrubs	Grass and Shrubs	GS	47	31.3 ±3.79
Impervious Building	Impervious Building	IB	57	38.0 ±3.96

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East Springfield Neighborhood - By Area

i-Tree Canopy v5.1

Cover Report - 1/10/14

Cover Class	Description	Abbr.	Points	Land Cover
Tree	Tree, non-shrub	T	26	0.54 ±0.10
Grass and Shrubs	All other surfaces	GS	47	0.97 ±0.12
Impervious Building	Impervious Building	IB	77	1.59 ±0.13

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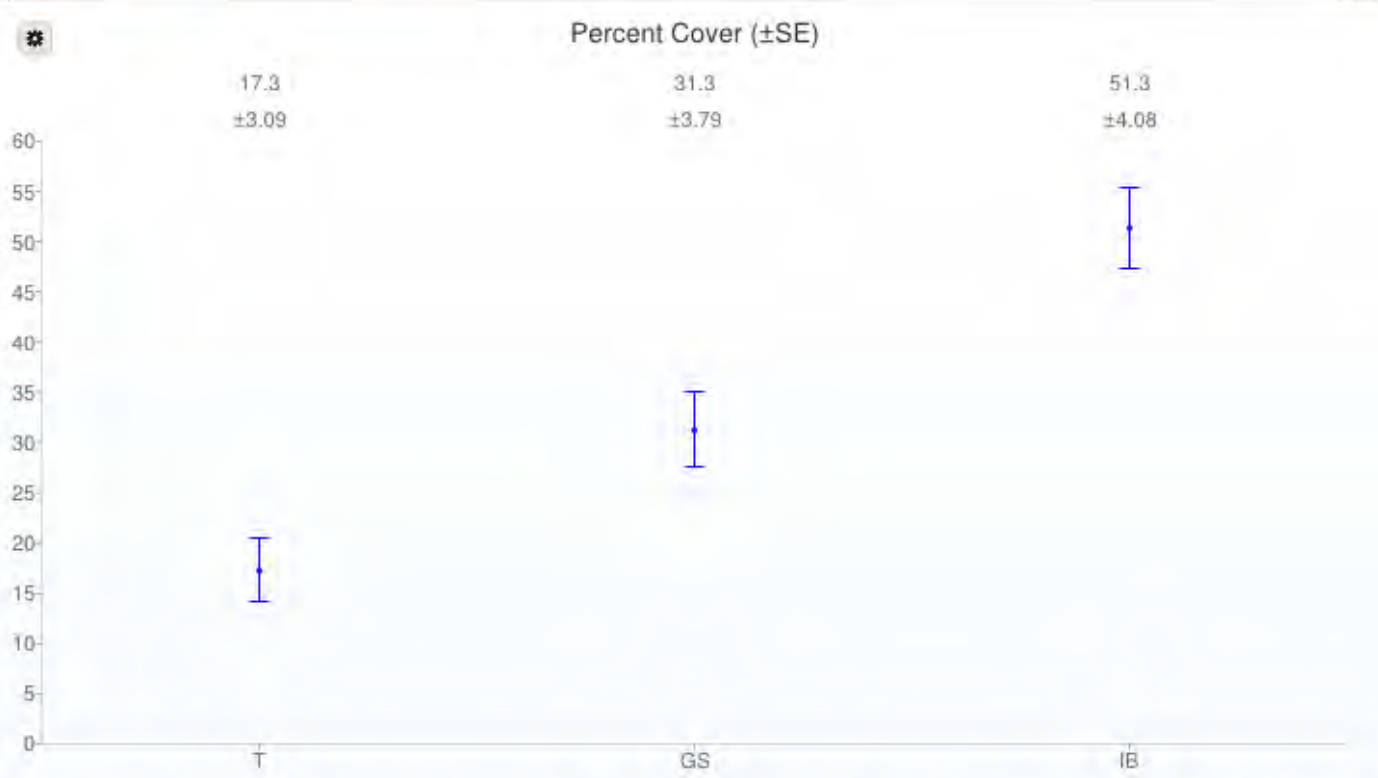

Cover Class	Description	Abbr.	Points	% Cover
Tree	Tree, non-shrub	T	26	17.3 ±3.09
Grass and Shrubs	All other surfaces	GS	47	31.3 ±3.79
Impervious Building	Impervious Building	IB	77	51.3 ±4.08

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Cover Class	Description	Abbr.	Points	Land Cover
Tree	Tree, non-shrub	T	62	1.45 ±0.14
Grass and Shrubs	Grass and Shrubs	GS	36	0.84 ±0.12
Impervious Building	Impervious Building	IB	52	1.22 ±0.14

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Tree	Tree, non-shrub	T	62	41.3 ±4.02
Grass and Shrubs	Grass and Shrubs	GS	36	24.0 ±3.49
Impervious Building	Impervious Building	IB	52	34.7 ±3.89

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Indian Orchard Neighborhood - By Area

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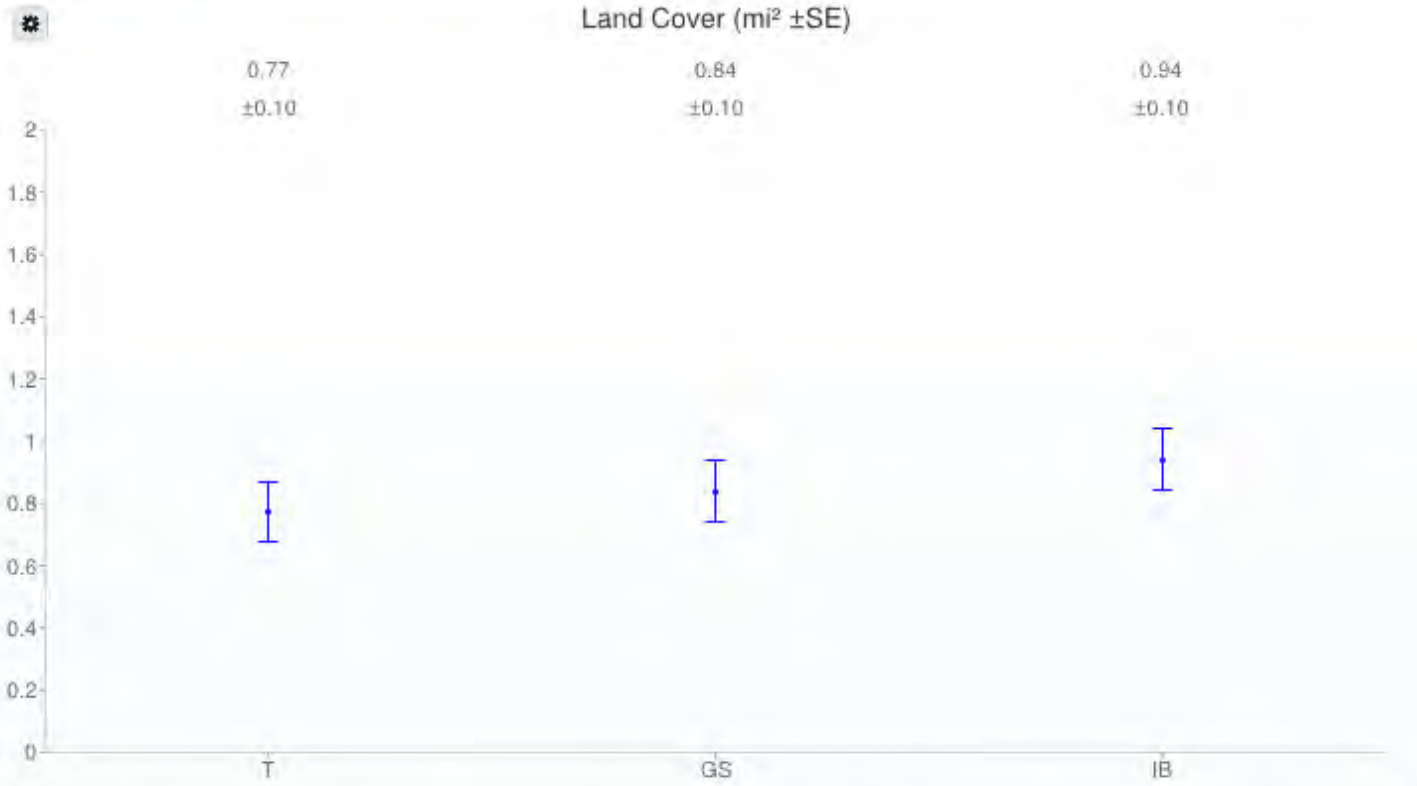

Cover Class	Description	Abbr.	Points	Land Cover
Tree	Tree, non-shrub	T	45	0.77 ±0.10
Grass and Shrub	Grass and Shrub	GS	49	0.84 ±0.10
Impervious Building	Impervious Building	IB	55	0.94 ±0.10

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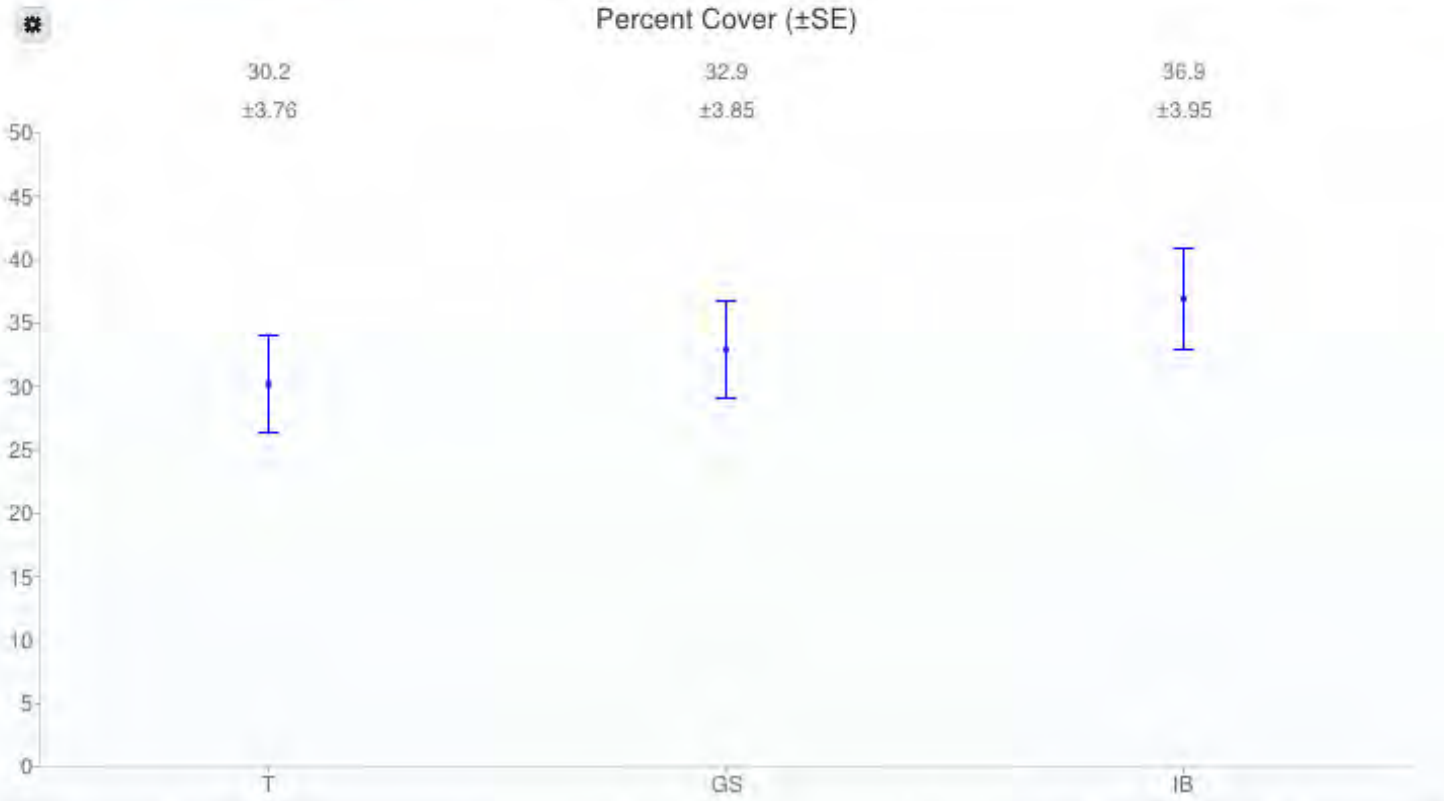
i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	% Cover
Tree	Tree, non-shrub	T	45	30.2 ±3.76
Grass and Shrub	Grass and Shrub	GS	49	32.9 ±3.85
Impervious Building	Impervious Building	IB	55	36.9 ±3.95

About i-Tree Canopy

The concept and prototype of this program were developed by David J. Nowak, Jeffery T. Walton and Eric J. Greenfield (USDA Forest Service). The current version of this program was developed and adapted to i-Tree by David Ellingsworth, Mike Binkley, and Scott Maco (The Davey Tree Expert Company).

Limitations of i-Tree Canopy

The accuracy of the analysis depends upon the ability of the user to correctly classify each point into its correct class. As the number of points increase, the precision of the estimate will increase as the standard error of the estimate will decrease. If too few points are classified, the standard error will be too high to have any real certainty of the estimate.

A Cooperative Initiative Between:

DAVEY Arbor Day Foundation sma ISA Casey Trees

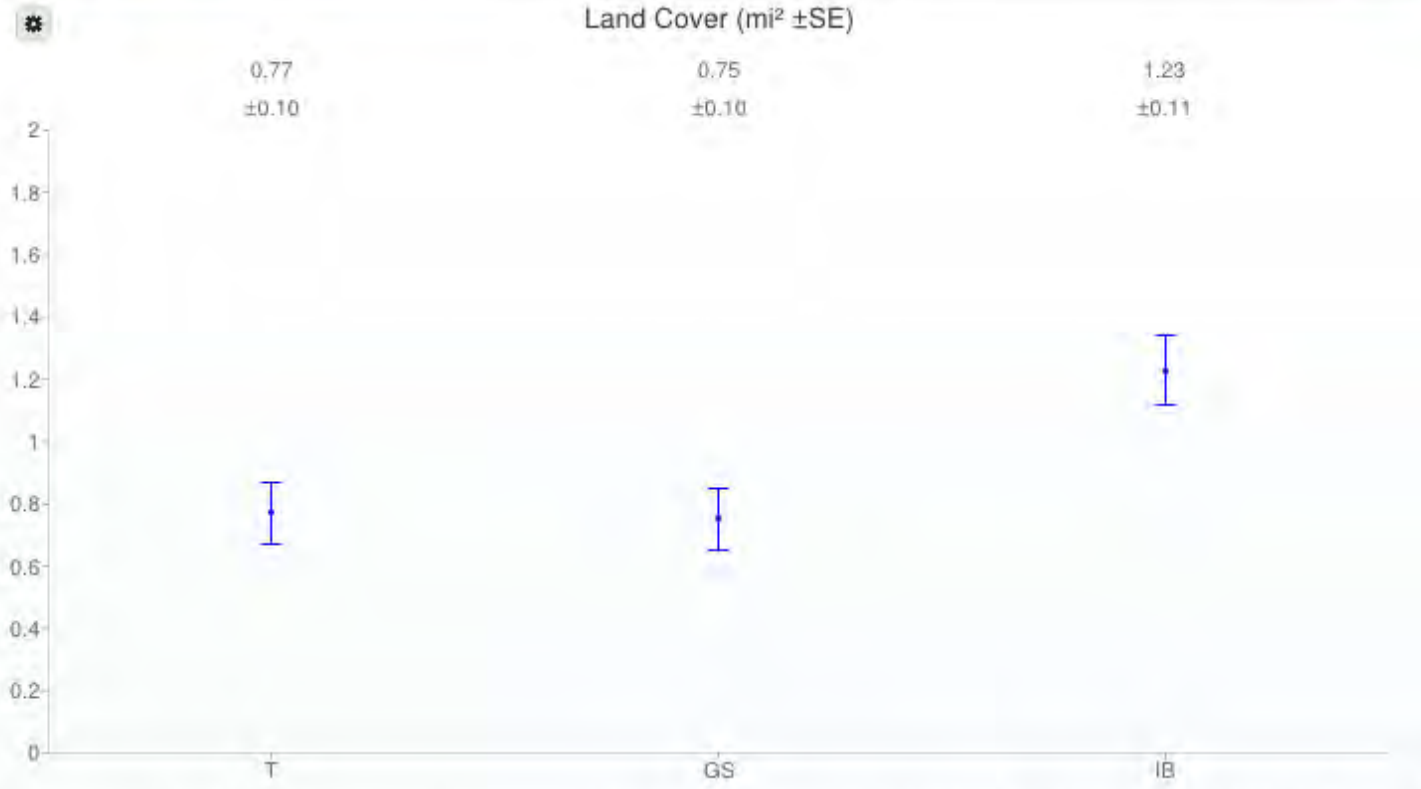
Regreen Springfield in partnership with the US Forest Service:

iTree Canopy Assessment

Liberty Heights Neighborhood - By Area

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	Land Cover
Tree	Tree, non-shrub	T	42	0.77 ±0.10
Grass and Shrubs	Grass and Shrubs	GS	41	0.75 ±0.10
Impervious Building	Impervious Building	IB	67	1.23 ±0.11

About i-Tree Canopy

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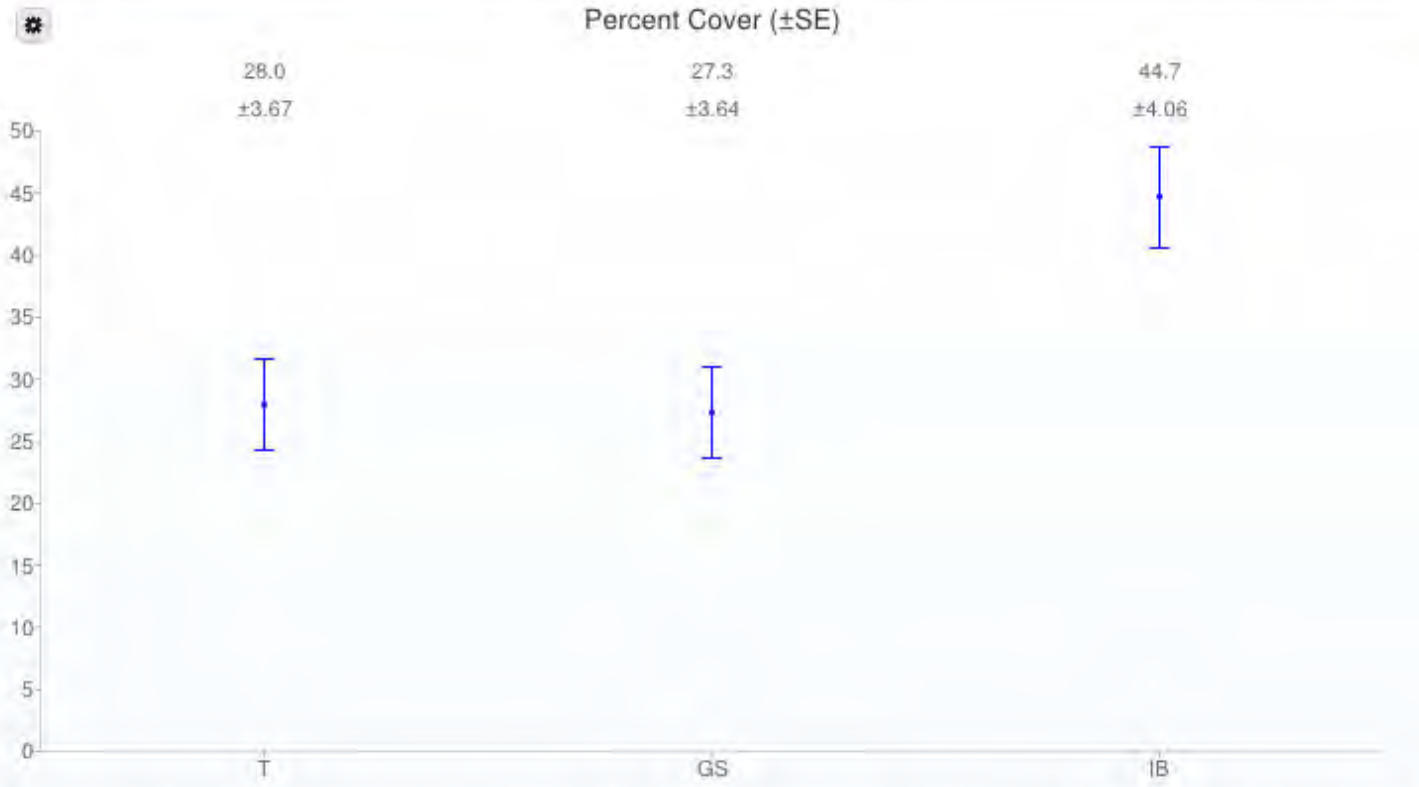
iTree Canopy Assessment

Liberty Heights Neighborhood - % Canopy Cover

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	% Cover
Tree	Tree, non-shrub	T	42	28.0 ±3.67
Grass and Shrubs	Grass and Shrubs	GS	41	27.3 ±3.64
Impervious Building	Impervious Building	IB	67	44.7 ±4.06

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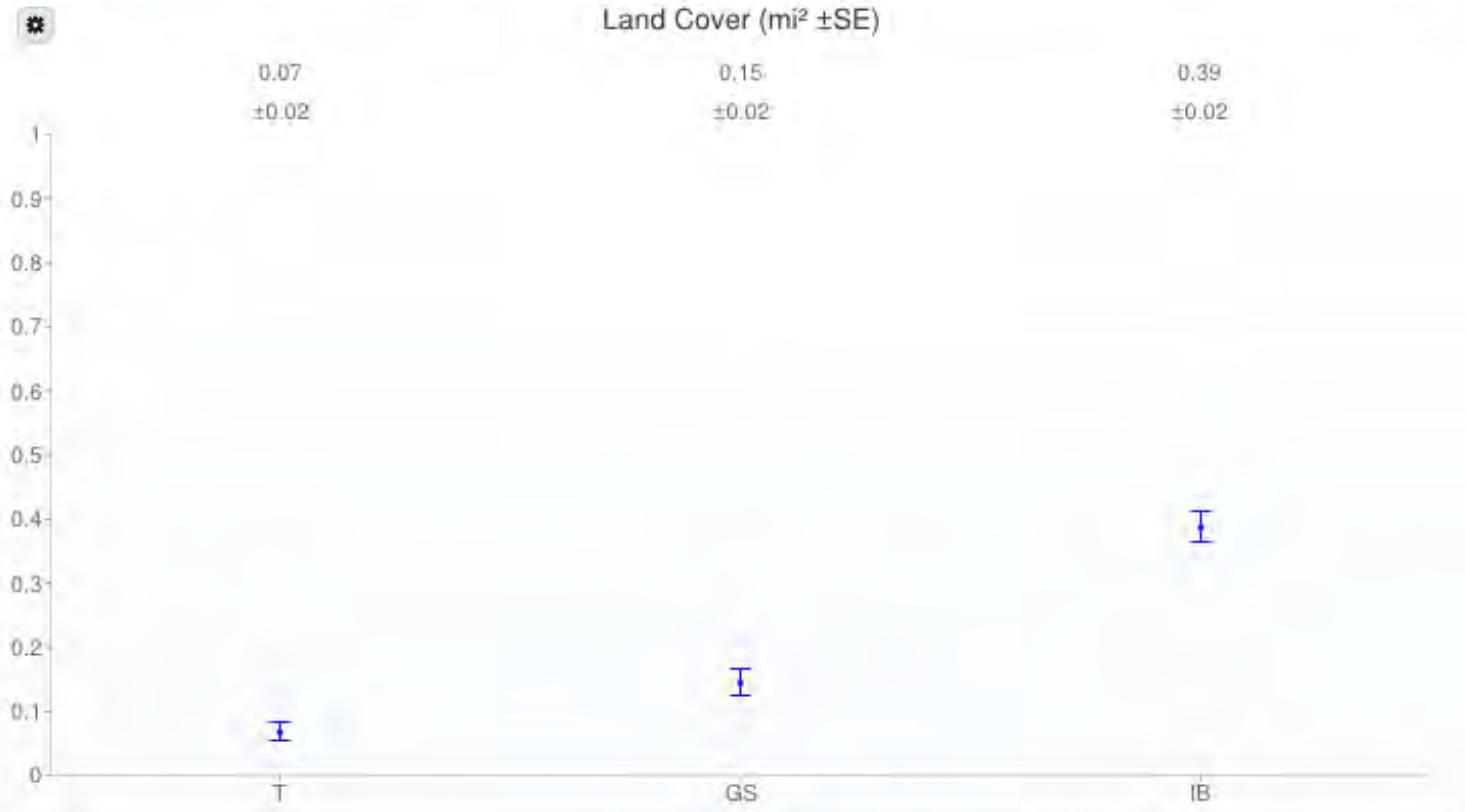
Regreen Springfield in partnership with the US Forest Service:

iTree Canopy Assessment

McKnight Neighborhood - By Area

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	Land Cover
Tree	Tree, non-shrub	T	17	0.07 ±0.02
Grass and Shrubs	Grass and Shrubs	GS	36	0.15 ±0.02
Impervious Building	Impervious Building	IB	96	0.39 ±0.02

About i-Tree Canopy

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iTree Canopy Assessment

McKnight Neighborhood - % Canopy Cover

i-Tree Canopy v5.1

Cover Report - 1/10/14

Cover Class	Description	Abbr.	Points	% Cover
Tree	Tree, non-shrub	T	17	11.4 ±2.60
Grass and Shrubs	Grass and Shrubs	GS	36	24.2 ±3.51
Impervious Building	Impervious Building	IB	96	64.4 ±3.92

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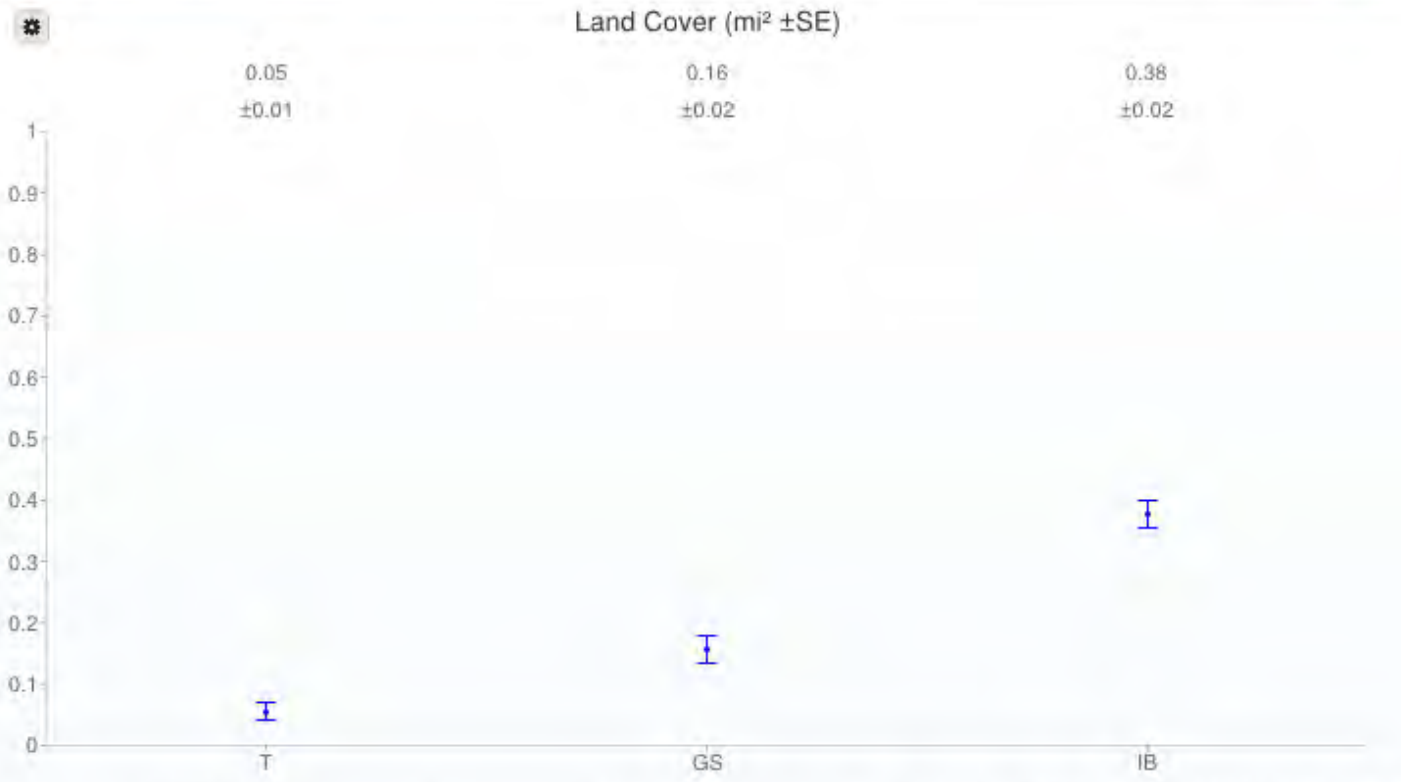
iTree Canopy Assessment

Memorial Square Neighborhood - By Area

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	Land Cover
Tree	Tree, non-shrub	T	14	0.05 ±0.01
Grass and Shrubs	Grass and Shrubs	GS	40	0.16 ±0.02
Impervious Building	Impervious Building	IB	96	0.38 ±0.02

About i-Tree Canopy

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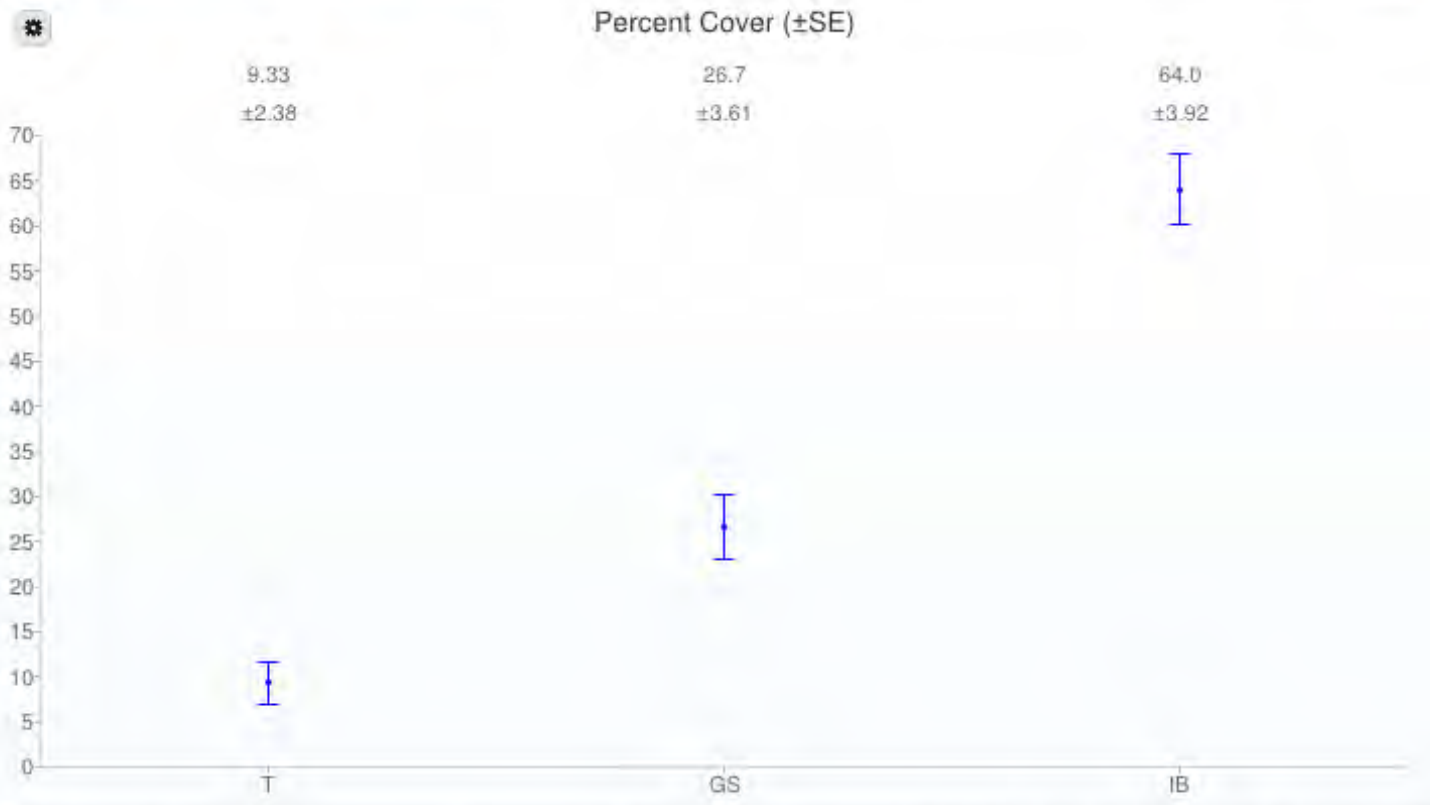
iTree Canopy Assessment

Memorial Square Neighborhood - % Canopy Cover

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	% Cover
Tree	Tree, non-shrub	T	14	9.33 ±2.38
Grass and Shrubs	Grass and Shrubs	GS	40	26.7 ±3.61
Impervious Building	Impervious Building	IB	96	64.0 ±3.92

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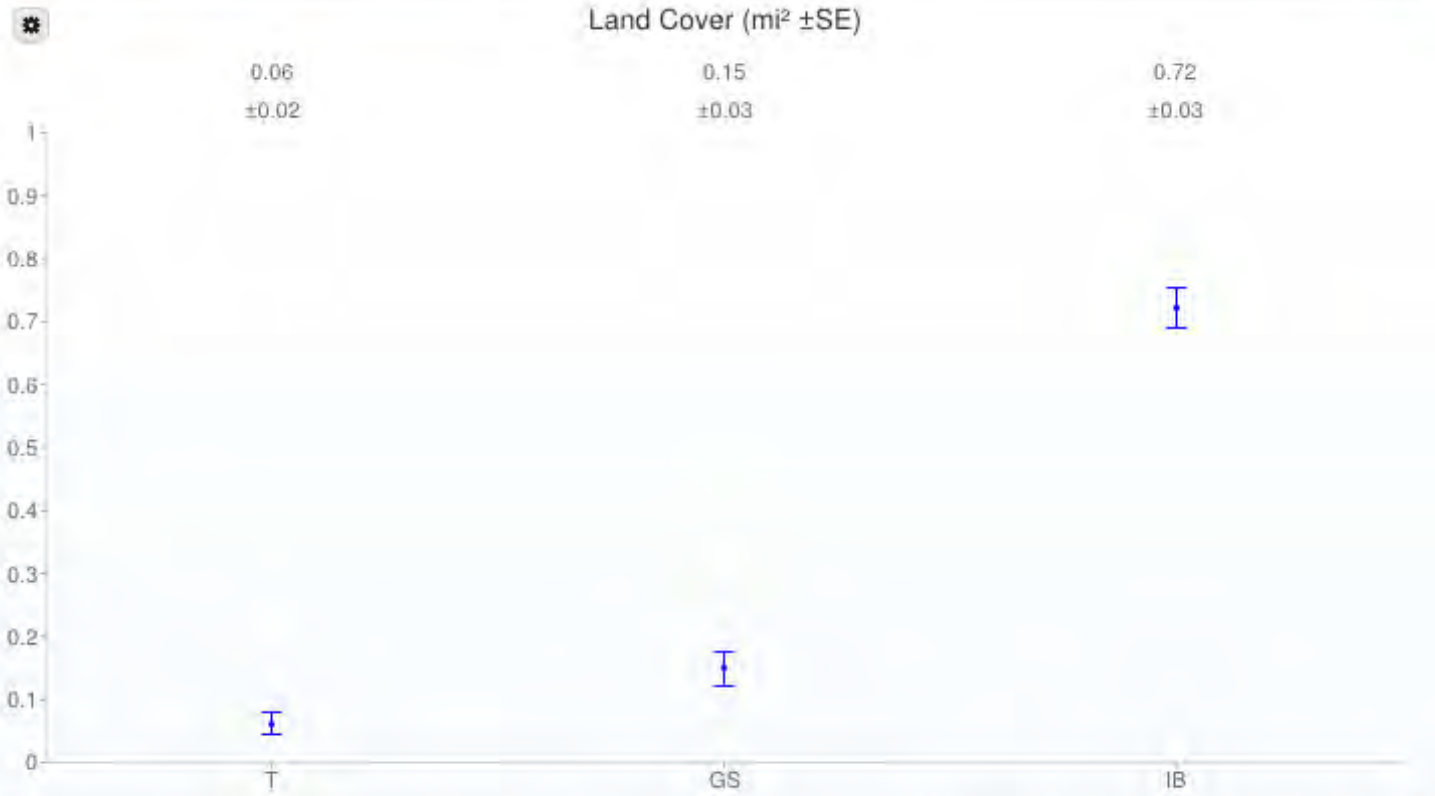
Regreen Springfield in partnership with the US Forest Service:

iTree Canopy Assessment

Metro Center Neighborhood - By Area

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	Land Cover
Tree	Tree, non-shrub	T	10	0.06 ±0.02
Grass and Shrubs	Grass and Shrubs	GS	24	0.15 ±0.03
Impervious Building	Impervious Building	IB	116	0.72 ±0.03

About i-Tree Canopy

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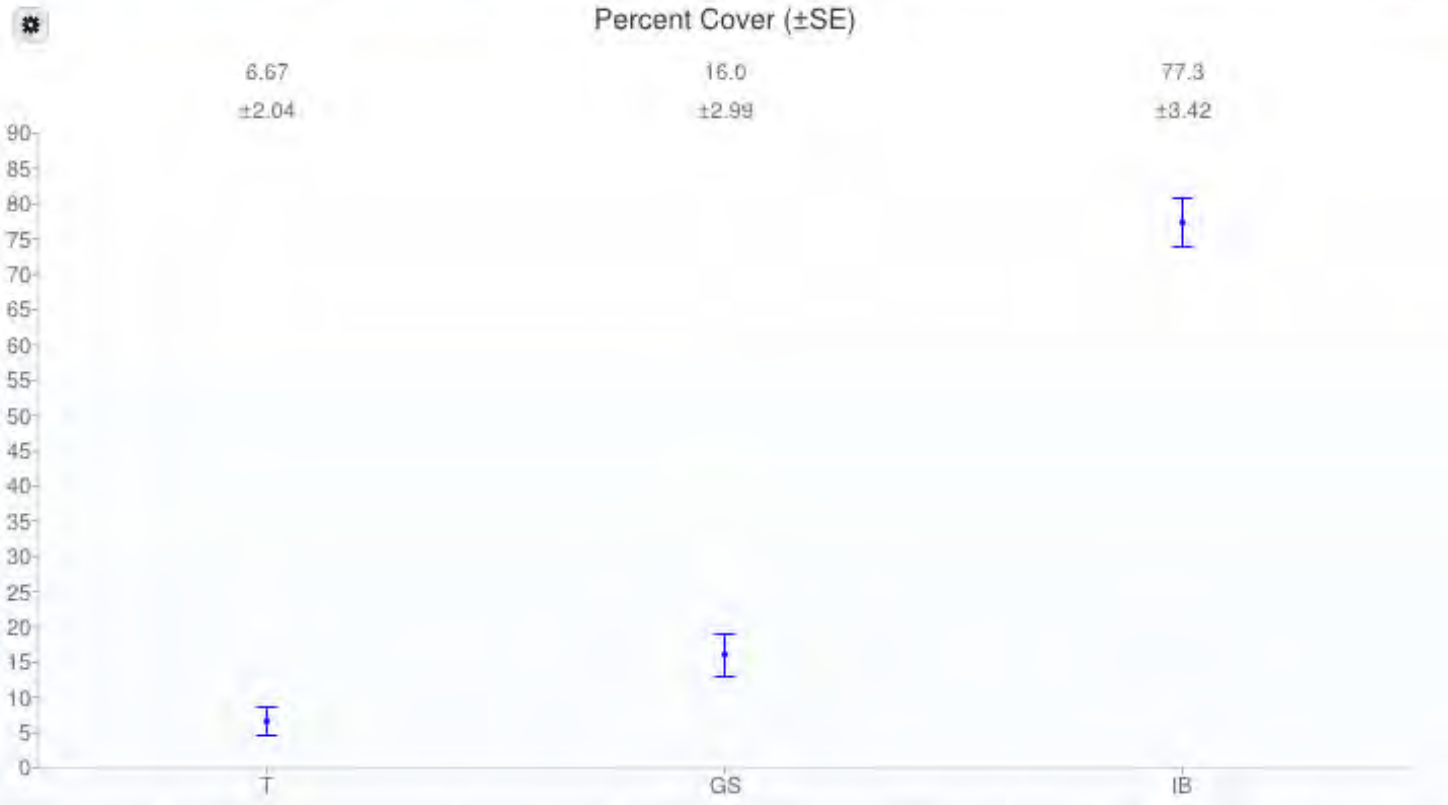
iTree Canopy Assessment

Metro Center Neighborhood - % Canopy Cover

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	% Cover
Tree	Tree, non-shrub	T	10	6.67 ±2.04
Grass and Shrubs	Grass and Shrubs	GS	24	16.0 ±2.99
Impervious Building	Impervious Building	IB	116	77.3 ±3.42

About i-Tree Canopy

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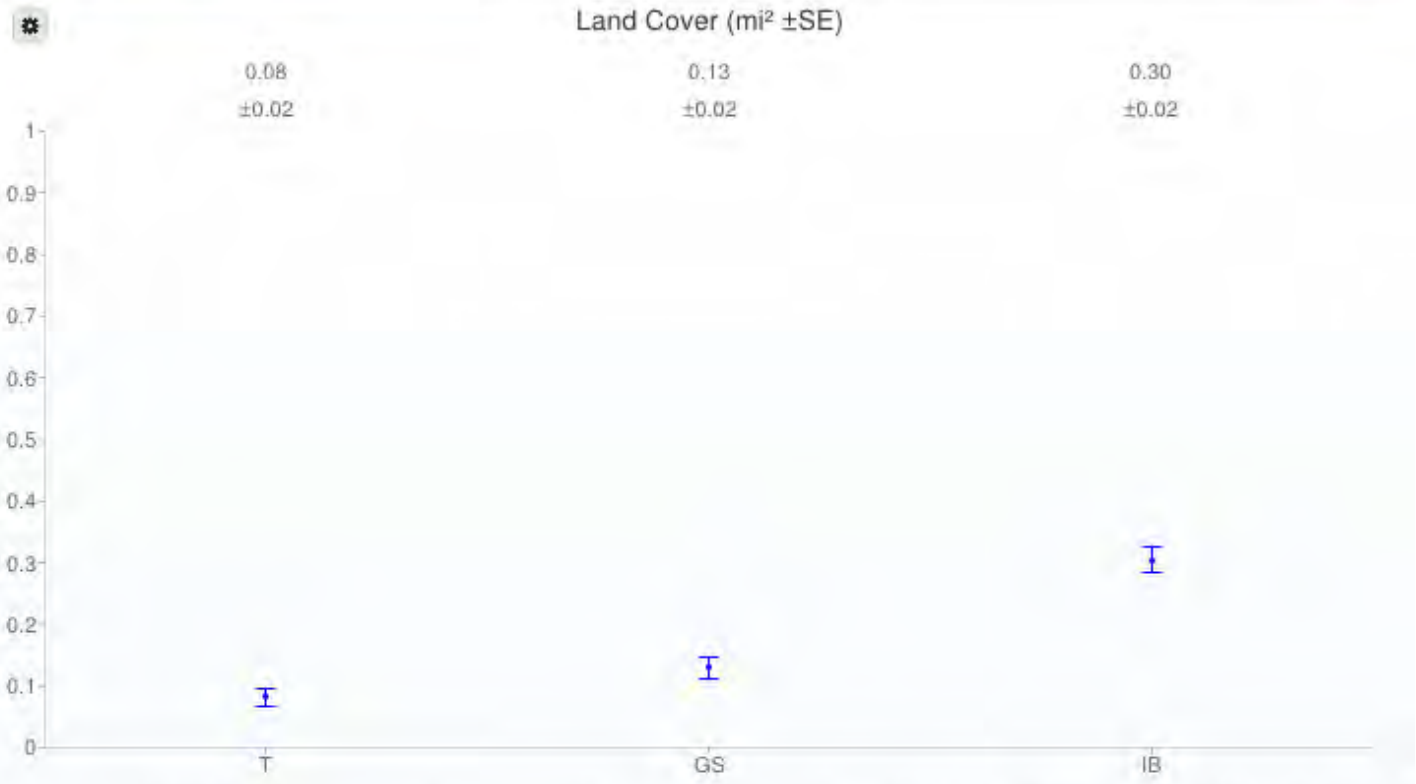
Regreen Springfield in partnership with the US Forest Service:

iTree Canopy Assessment

Old Hill Neighborhood - By Area

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	Land Cover
Tree	Tree, non-shrub	T	24	0.08 ±0.02
Grass and Shrubs	All other surfaces	GS	38	0.13 ±0.02
Impervious Building	Impervious Building	IB	89	0.30 ±0.02

About i-Tree Canopy

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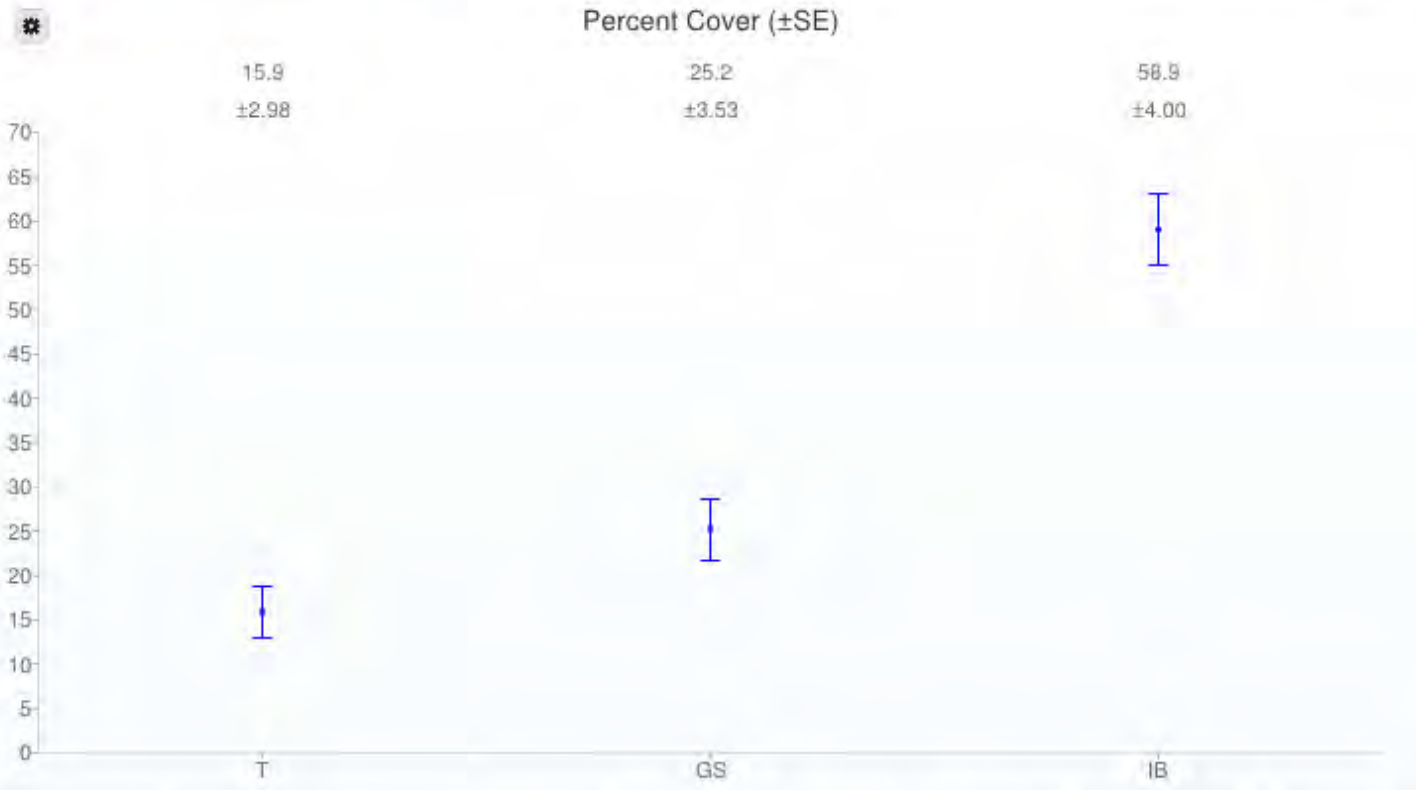
iTree Canopy Assessment

Old Hill Neighborhood - % Canopy Cover

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	% Cover
Tree	Tree, non-shrub	T	24	15.9 ±2.98
Grass and Shrubs	All other surfaces	GS	38	25.2 ±3.53
Impervious Building	Impervious Building	IB	89	58.9 ±4.00

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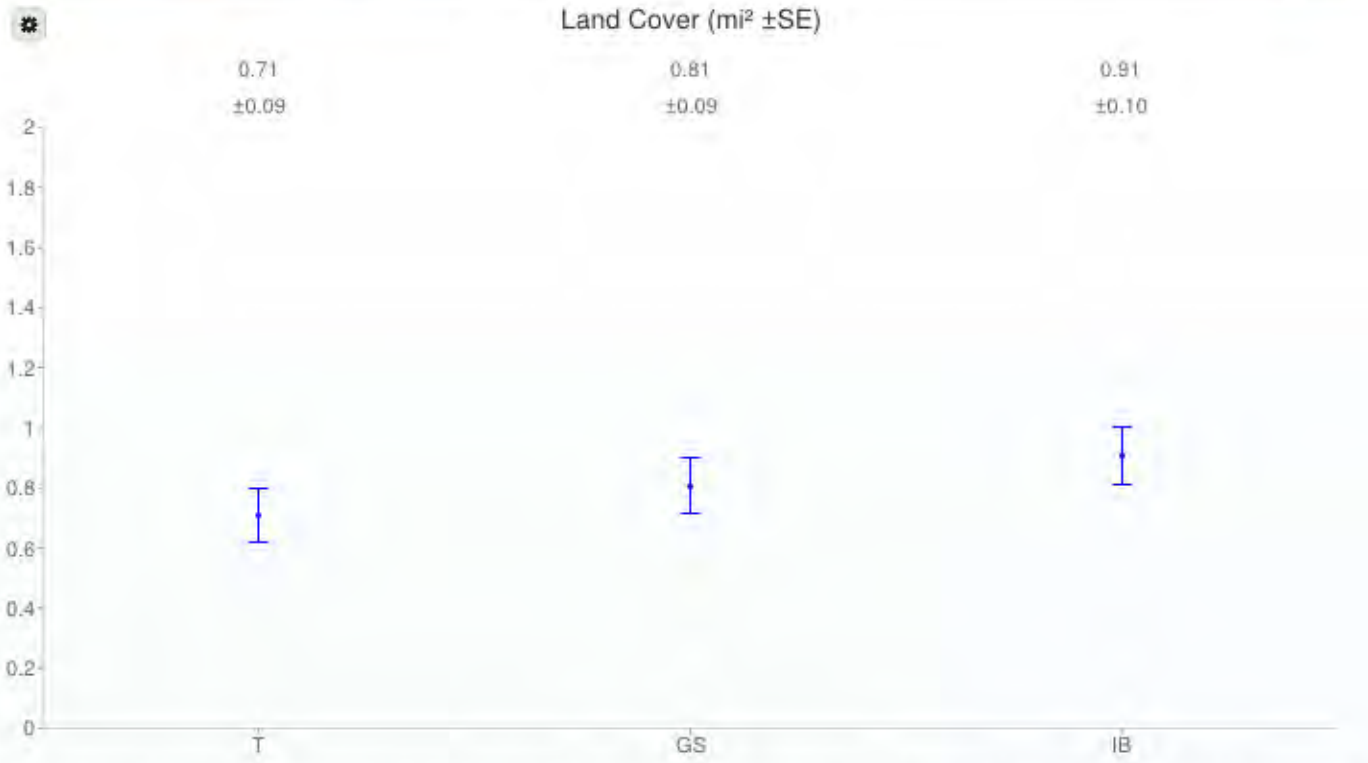
Regreen Springfield in partnership with the US Forest Service:

iTree Canopy Assessment

Pine Point Neighborhood - By Area

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	Land Cover
Tree	Tree, non-shrub	T	44	0.71 ±0.09
Grass and Shrubs	All other surfaces	GS	50	0.81 ±0.09
Impervious Building	Impervious Building	IB	56	0.91 ±0.10

About i-Tree Canopy

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iTree Canopy Assessment

Pine Point Neighborhood - % Canopy Cover

i-Tree Canopy v5.1

Cover Report - 1/10/14

Cover Class	Description	Abbr.	Points	% Cover
Tree	Tree, non-shrub	T	44	29.3 ±3.72
Grass and Shrubs	All other surfaces	GS	50	33.3 ±3.85
Impervious Building	Impervious Building	IB	56	37.3 ±3.95

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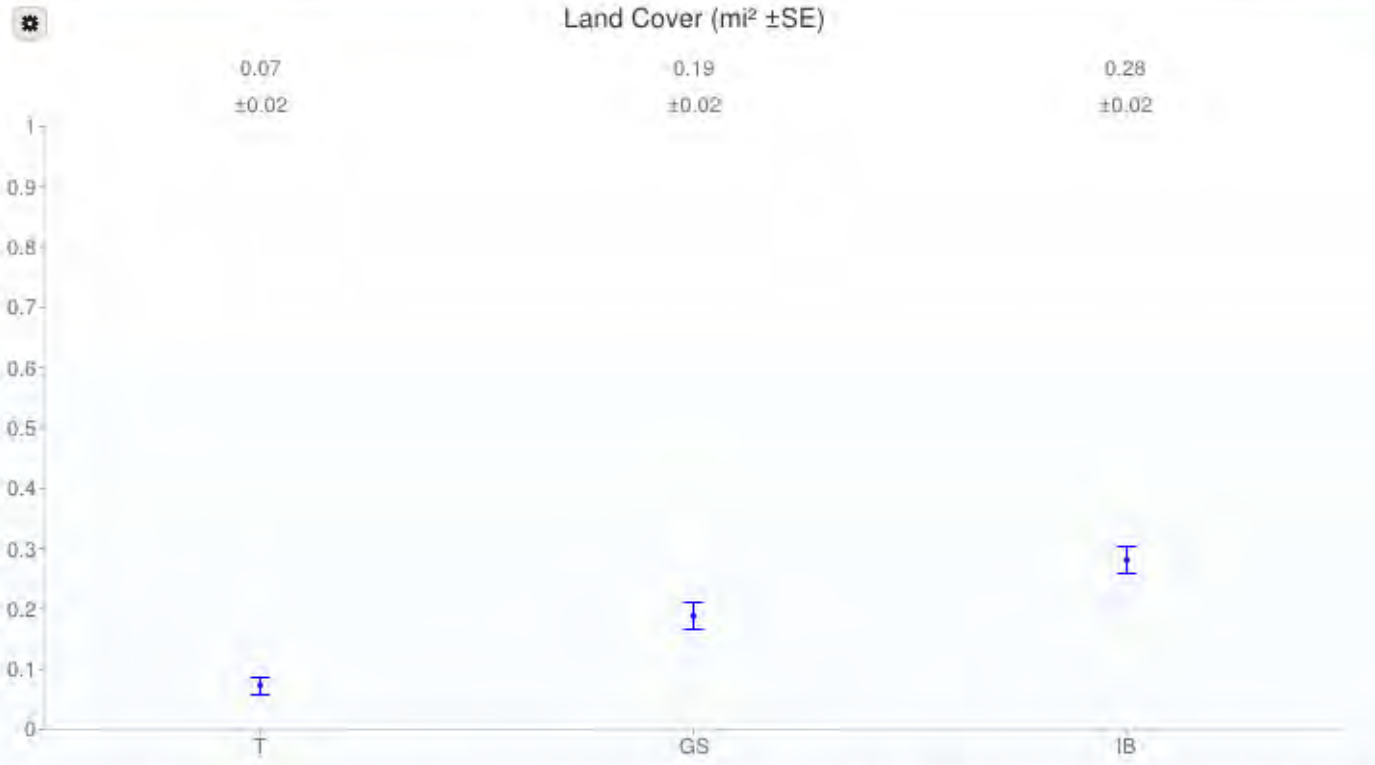
iTree Canopy Assessment

Six Corners Neighborhood - By Area

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	Land Cover
Tree	Tree, non-shrub	T	20	0.07 ±0.02
Grass and Shrubs	Grass and Shrubs	GS	52	0.19 ±0.02
Impervious Building	Impervious Building	IB	78	0.28 ±0.02

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Six Corners Neighborhood - % Canopy Cover

i-Tree Canopy v5.1

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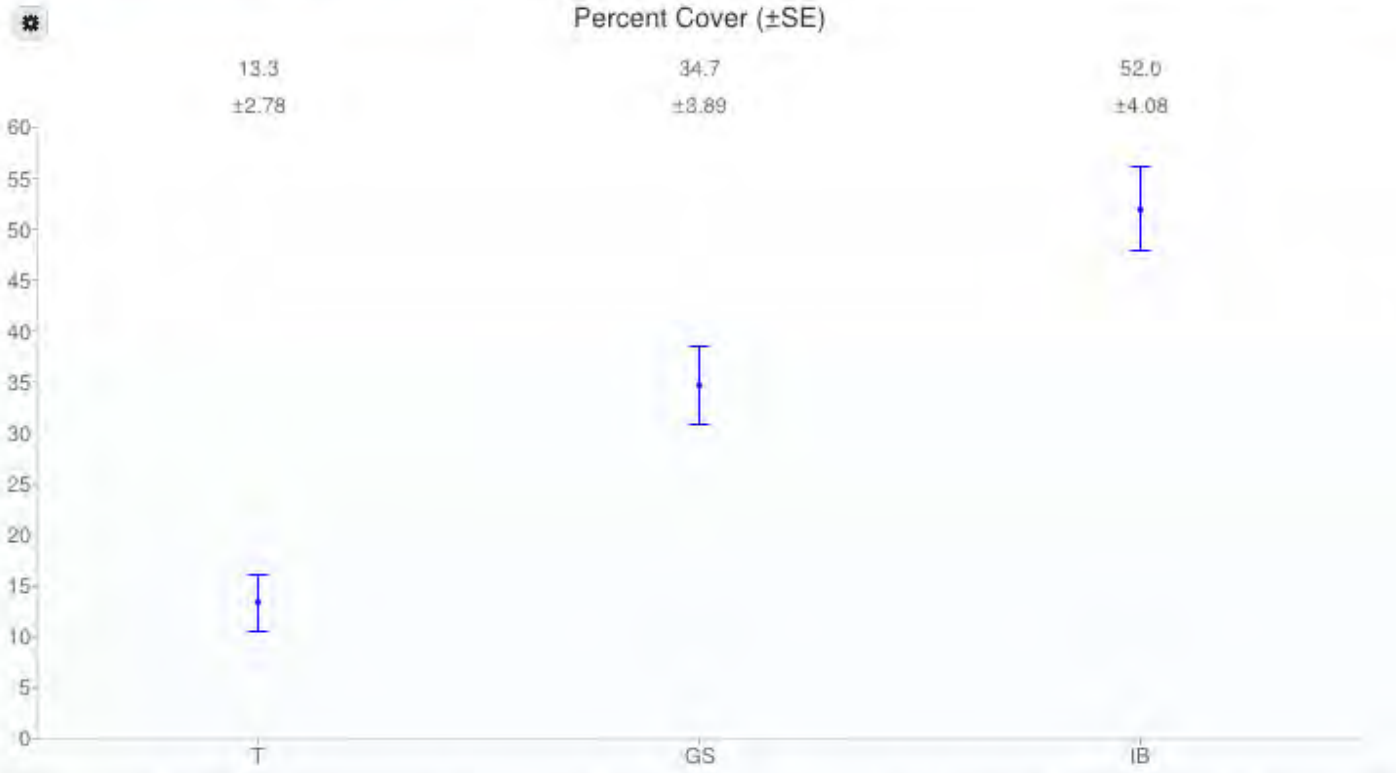

Cover Class	Description	Abbr.	Points	% Cover
Tree	Tree, non-shrub	T	20	13.3 ±2.78
Grass and Shrubs	Grass and Shrubs	GS	52	34.7 ±3.89
Impervious Building	Impervious Building	IB	78	52.0 ±4.08

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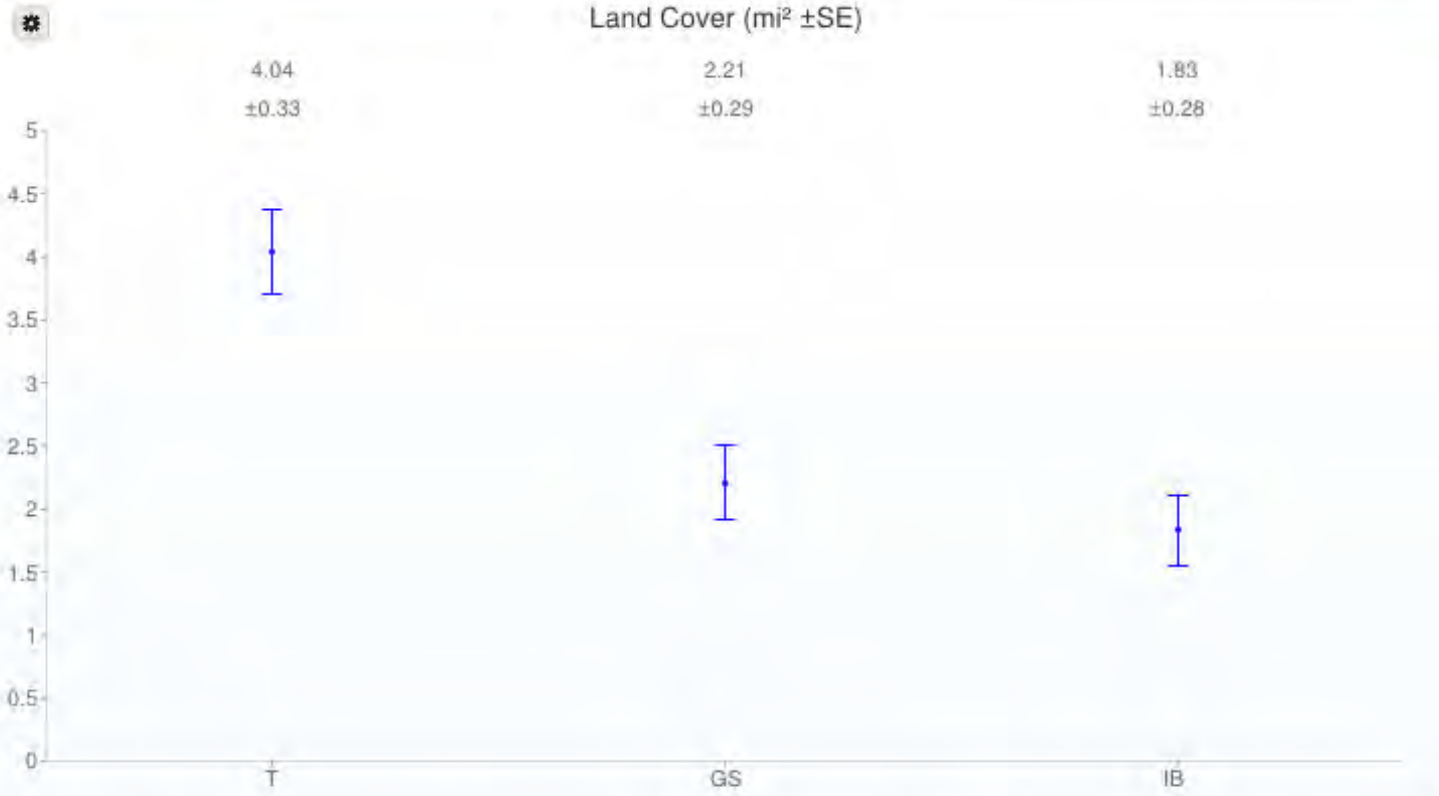
iTree Canopy Assessment

Sixteen Acres Neighborhood - By Area

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	Land Cover
Tree	Tree, non-shrub	T	75	4.04 ±0.33
Grass and Shrubs	Grass and Shrubs	GS	41	2.21 ±0.29
Impervious Building	Impervious Building	IB	34	1.83 ±0.28

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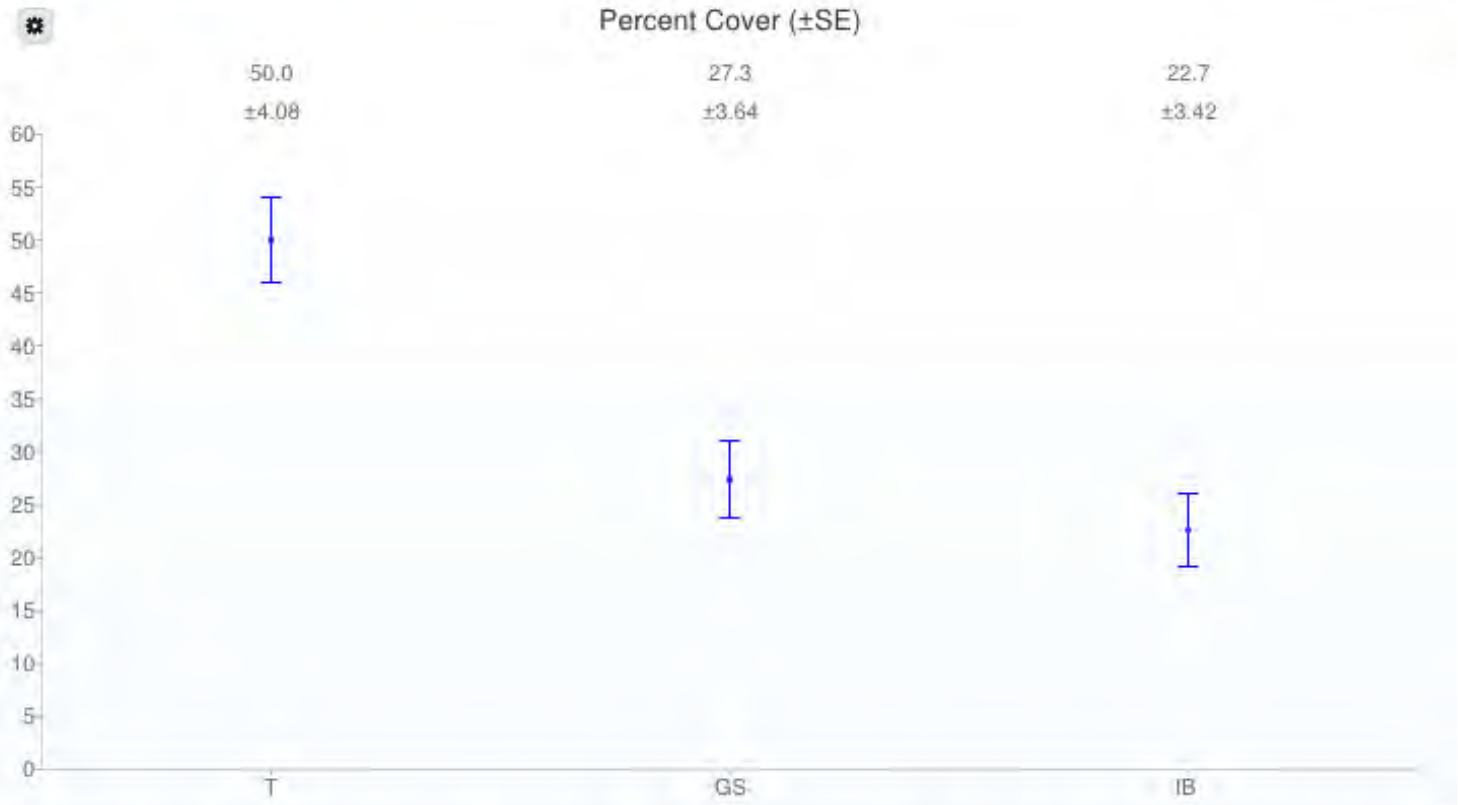
iTree Canopy Assessment

Sixteen Acres Neighborhood - % Canopy Cover

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	% Cover
Tree	Tree, non-shrub	T	75	50.0 ±4.08
Grass and Shrubs	Grass and Shrubs	GS	41	27.3 ±3.64
Impervious Building	Impervious Building	IB	34	22.7 ±3.42

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A Cooperative Initiative Between:

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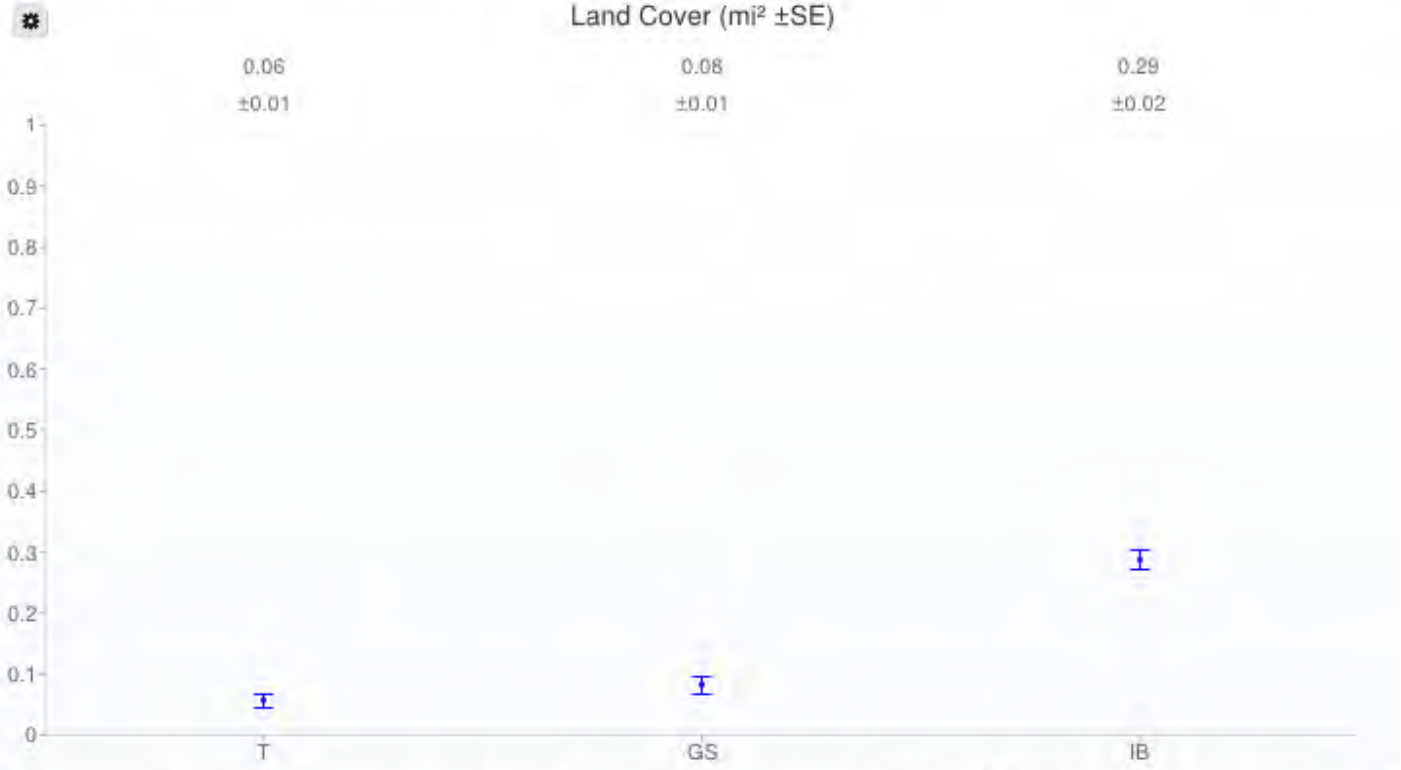
Regreen Springfield in partnership with the US Forest Service:

iTree Canopy Assessment

South End Neighborhood - By Area

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	Land Cover
Tree	Tree, non-shrub	T	20	0.06 ±0.01
Grass and Shrubs	Grass and Shrubs	GS	29	0.08 ±0.01
Impervious Building	Impervious Building	IB	101	0.29 ±0.02

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South End Neighborhood - % Canopy Cover

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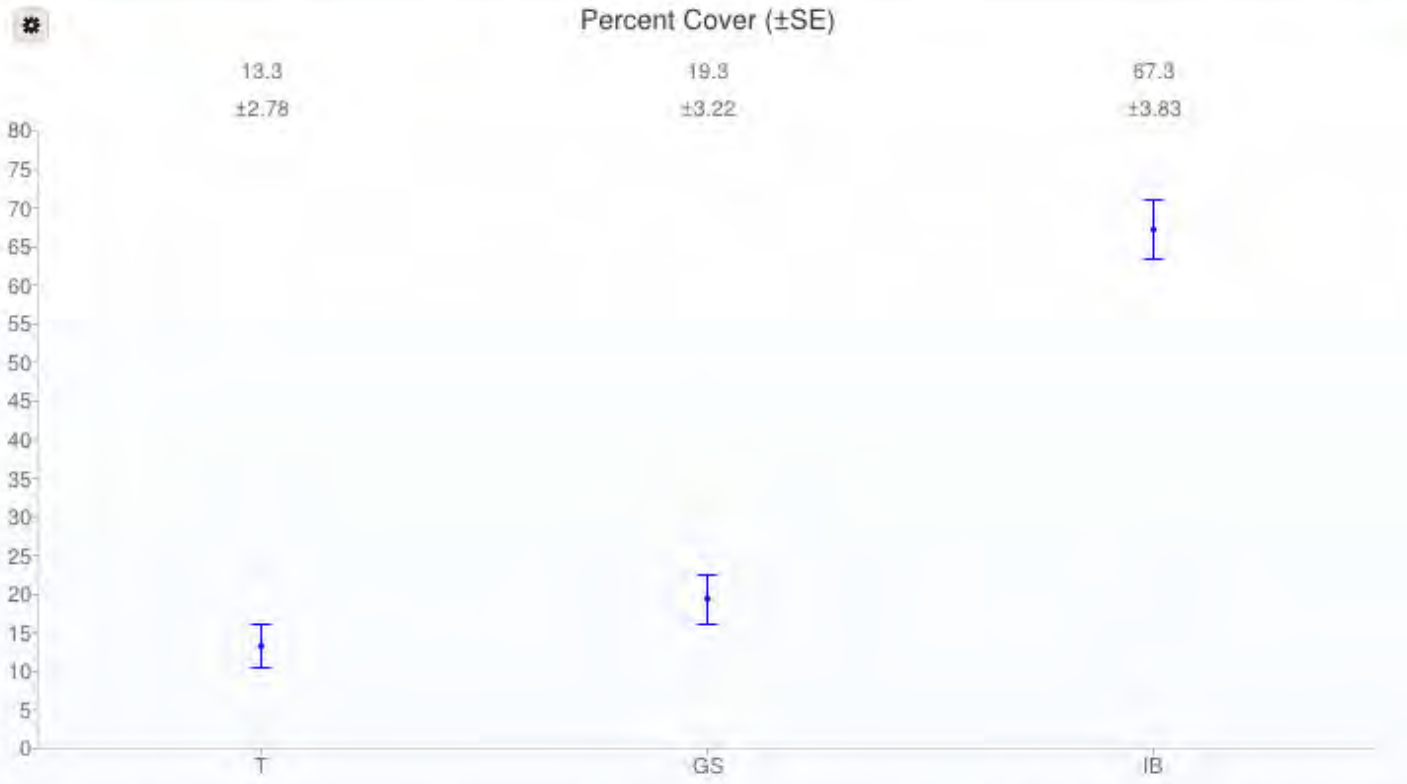
Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	% Cover
Tree	Tree, non-shrub	T	20	13.3 ±2.78
Grass and Shrubs	Grass and Shrubs	GS	29	19.3 ±3.22
Impervious Building	Impervious Building	IB	101	67.3 ±3.83

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The accuracy of the analysis depends upon the ability of the user to correctly classify each point into its correct class. As the number of points increase, the precision of the estimate will increase as the standard error of the estimate will decrease. If too few points are classified, the standard error will be too high to have any real certainty of the estimate.

A Cooperative Initiative Between:

DAVEY Arbor Day Foundation sma ISA Casey Trees

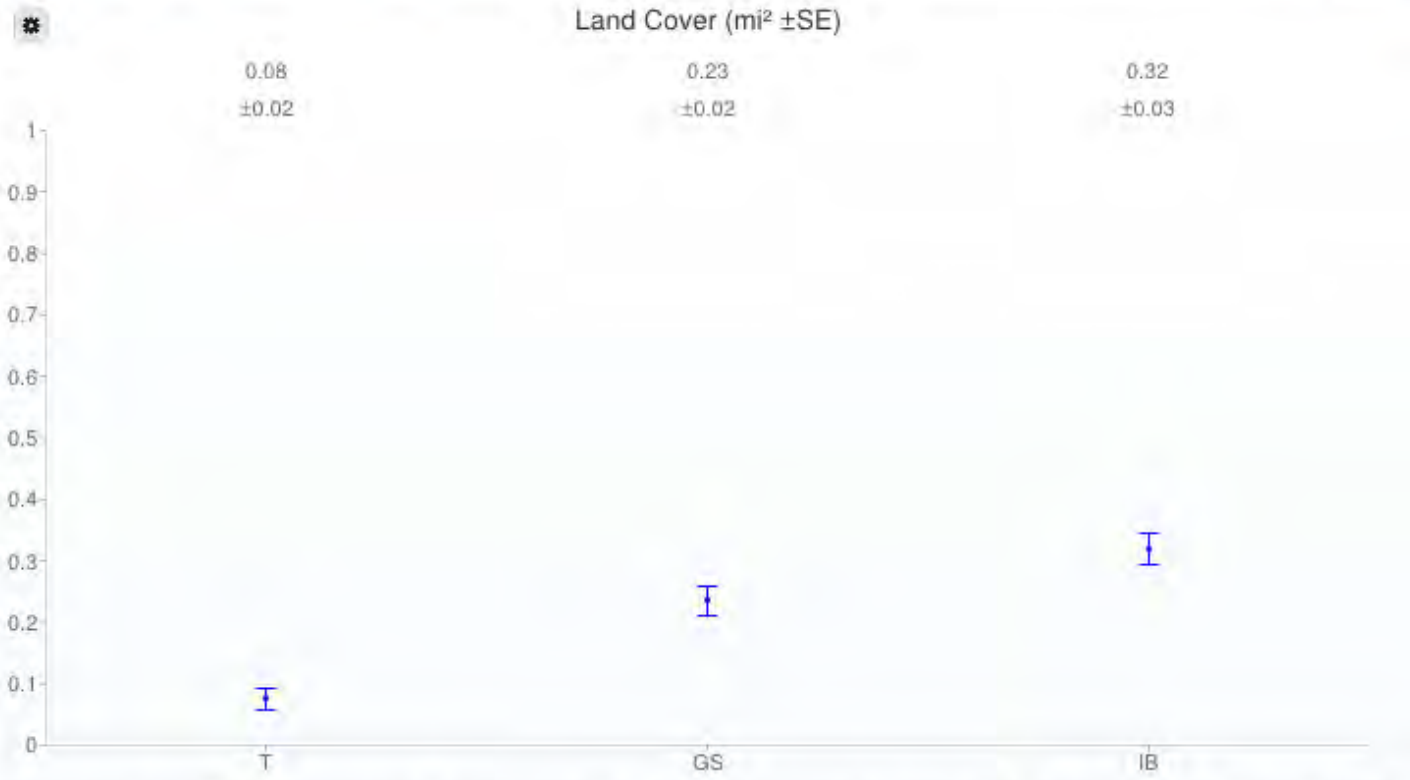
Regreen Springfield in partnership with the US Forest Service:

iTree Canopy Assessment

Upper Hill Neighborhood - By Area

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	Land Cover
Tree	Tree, non-shrub	T	18	0.08 ±0.02
Grass and Shrub	Grass and Shrub	GS	56	0.23 ±0.02
Impervious Building	Impervious Building	IB	76	0.32 ±0.03

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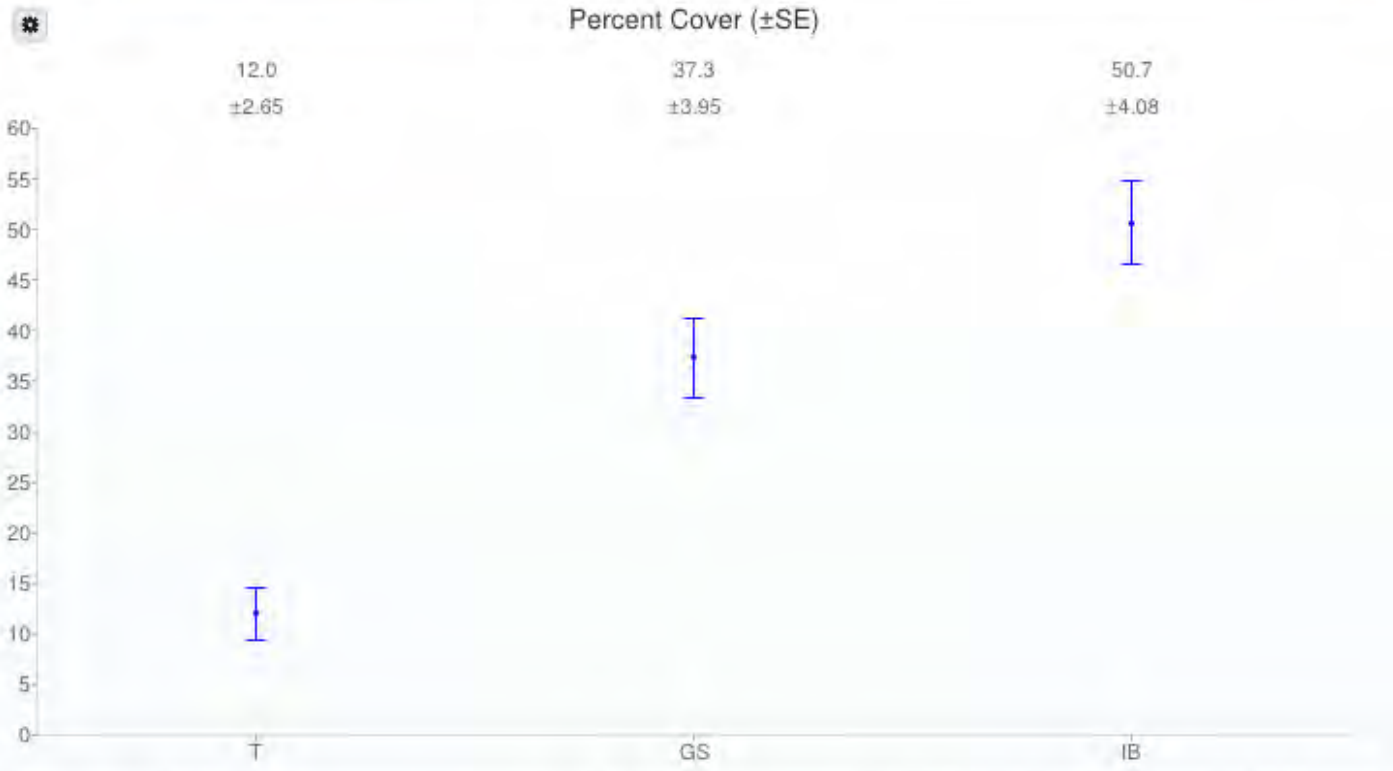
Upper Hill Neighborhood - % Canopy Cover

i-Tree Canopy v5.1

Cover Report - 1/10/14



Cover Class	Description	Abbr.	Points	% Cover
Tree	Tree, non-shrub	T	18	12.0 ±2.65
Grass and Shrub	Grass and Shrub	GS	56	37.3 ±3.95
Impervious Building	Impervious Building	IB	76	50.7 ±4.08

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