TREE CANOPY STUDY

FOR

LONG BRANCH CITY

Monmouth County, New Jersey

Prepared by:

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Licensed Tree Expert

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Tree Canopy Study
Long Branch, New Jersey

Introduction

CME Associates was authorized by the City council to prepare a Tree Canopy Study for the City. The purpose of this study is to give Long Branch a better understanding of their tree canopy. In order to set goals to increase the City's tree canopy, it is helpful to know the current footprint, or baseline, of the urban forest. This measurement of the trees within the City and the services they provide can be used to help set and maintain goals as well as prioritize actions to be taken.

Our office, in conjunction with the volunteers from the Environmental Commission, completed the canopy study using the i-Tree Canopy software. This web-based computer program estimates tree cover using a random sampling process. Points within the City are randomly generated and with the use of Google Maps aerial photography, ground cover types are classified by the user to determine the city's cover composition. Once enough sampling points have been collected, ground cover types are estimated along with tree benefits, such as how much carbon monoxide is removed annually, the amount of carbon dioxide sequestered annually in trees, etc.

Method

Using i-Tree Canopy, our office provided the limits of the City to map the area for data collection. Once the area of study was loaded in to the program, this file could then be saved and distributed. Volunteers from the Environmental Commission were emailed the file to label cover classes the computer program provided. After collecting at least fifty data points, the volunteer emailed the file back to our office to verify the data was saved and accurate. This process of data collecting by volunteers was continued until 1,200 points were logged, exceeding iTree's recommendation of 1,000 points. Upon completion, iTree software generated the appropriate coverage reports.

In addition to using the computer program, Shari Spero, a licensed tree expert, has also driven through various areas of the City to determine some of the tree species that dominate the city's urban forest, which are discussed in further detail herein.

Results

The results of the canopy study showed that Long Branch has a tree and landscape cover of approximately 26%. This has a standard error of 1.3. Using a 95% confidence interval, the cover class is between 23.5% and 28.5%. It also concluded that within the City, impervious surfaces account for almost 27%, buildings at 17% and grass and fields at 22%. Within this report, our office has provided an aerial map of the City to view its vegetated cover as well as the i-Tree Canopy generated reports.

With the current urban forest, 1,000 pounds of carbon monoxide (CO) is removed annually from the air, 4,200 tons of carbon dioxide (CO2) is sequestered annually and the trees store over 111,000 tons of CO2. Additional figures of the benefits of Long Branch's trees can be found in the attached report.

Discussion

The results of the tree canopy study identify open lawns and fields as a good portion of Long Branch's cover. Many of these areas are where trees could be planted to help increase the canopy cover. There are more locations for planting trees on private properties, but the City does have opportunities on public lands. Some of the neighborhoods have wide enough lawn strips for tree planting, while other neighborhoods do not have sidewalks at all, which would provide additional soil volume to support tree growth.

Besides plantings along the roads, the City has a variety of park properties that would benefit from additional trees and their shade. It appears there are pockets of open spaces at Takanassee Lake Park, Long Branch Volunteer Fire Department Memorial Park, Ross Lake Park and Jerry Morgan Park.

After performing a sample windshield survey, our office noted a variety of street trees/front yard trees along City streets. Tree species diversity should be the goal when planting along roadways, however, there does not appear to be a particular species that should be avoided due to current overuse. Due to the smaller yard frontages, many residents have ornamental trees such as Japanese maple trees, flowering cherry and dogwood. As common for street tree species, a variety of maples such as silver, Norway, sugar and red, along with London plane, linden, elm and beech can be observed. Many of the neighborhoods have large gaps in shade trees so concerns of a monoculture, which can lead to the spread of insect infestations and diseases, is not as great of a concern; however, this is more due to the limited trees along the streets and not because of diversity. Long Branch should focus its efforts into filling open gaps with an appropriate species for the planting location to improve its tree resource and its coverage.

Grant opportunities through the State Forest Service would allow for funds to be used to plant trees within the park properties as well as within the right-of-ways of neighborhoods that have the space for street trees. The Environmental Commission might also consider an outreach program to encourage residents to plant new shade trees on their front lawns as many residents have the space on their lawns, but do not have the space for a tree in the right-of-way. A cost share program where the City pays for a portion of the cost of a tree could be considered if funds are available for use. Another option would be for the City to purchase trees at wholesale cost and pass the savings on to the residents.

Conclusion

In conclusion, the current tree coverage within the City is approximately twenty-six (26) percent which is on par with other local urban municipalities. There are opportunities for additional areas to be planted as outlined above, which will further improve and increase the overall benefits offered by the urban forest.

Enclosed within this report, please find the following:

- Colored aerial map with coverage summary and potential planting locations
- Tree coverage summary reports generated by the i-Tree software

LAND COVERAGE MAP LONG BRANCH, N.J.

LAND COVERAGE MAP

LONG BRANCH CITY
MONMOUTH COUNTY
NEW JERSEY

Legend

Land Use

- Grass / Trees
- Beaches
- Wetlands
- Water Resources
- Impervious Coverage
- Potential Planting Locations

- Long Branch Parcels
- Long Branch Boundary

Source: NJDEP BUREAU OF GIS, NJOGIS

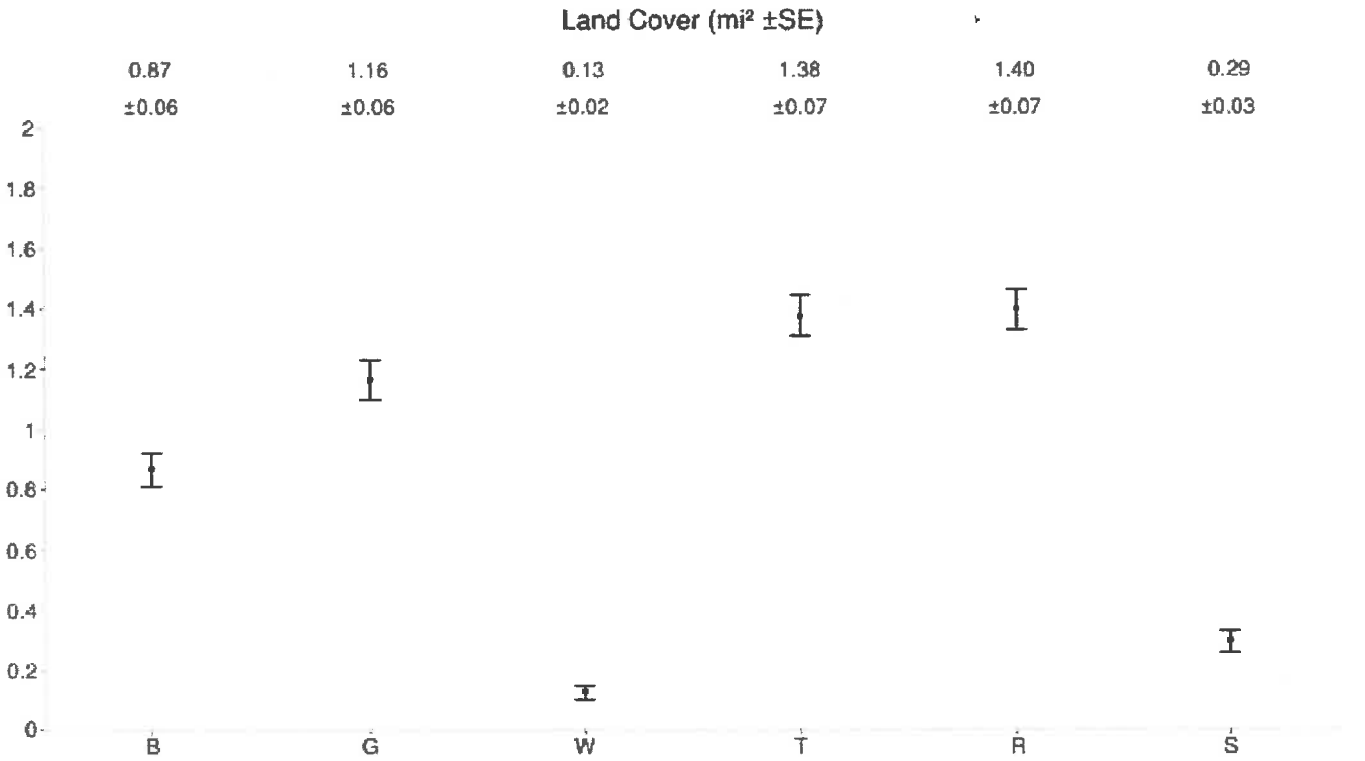
CME ASSOCIATES
CONSULTING & MUNICIPAL ENGINEERS
3141 BORDENTOWN AVENUE, PARLIN, N.J. 08859
1460 ROUTE 9 SOUTH HOWELL, N.J. 07731
3759 ROUTE 1 SOUTH SUITE 100, MONMOUTH JUNCTION, NJ 08852
ONE MARKET STREET SUITE 1F, CAMDEN, NJ 08102
WWW.CMEUSA1.COM

DATE	SCALE	LAST REVISED	CREATED BY
2/4/2019	1 inch = 1,000 feet	N/A	AM

i-Tree Canopy v6.1

Cover Assessment and Tree Benefits Report

Estimated using random sampling statistics on 1/03/19



Cover Class	Description	Abbr.	Points	Land Cover
Buildings	Buildings, Houses	B	199	0.87 ±0.06
Grass	Grass, Fields	G	267	1.16 ±0.06
Water	All waterways	W	29	0.13 ±0.02
Tree/Shrub	Trees, Shrubs, other landscaping	T	316	1.38 ±0.07
Impervious Roads	Roads, sidewalks	R	321	1.40 ±0.07
Soil/Sand	Soil, Sand, Bare ground	S	67	0.29 ±0.03

Tree Benefit Estimates

Abbr.	Benefit Description	Value	±SE	Amount	±SE
CO	Carbon Monoxide removed annually	217.80 USD	±10.51	1,006.86 lb	±48.61
NO2	Nitrogen Dioxide removed annually	523.29 USD	±25.26	3.16 T	±0.15
O3	Ozone removed annually	33,118.36 USD	±1,598.81	26.95 T	±1.30
PM2.5	Particulate Matter less than 2.5 microns removed annually	37,117.32 USD	±1,791.86	1,697.13 lb	±81.93
SO2	Sulfur Dioxide removed annually	34.55 USD	±1.67	1,530.83 lb	±73.90
PM10*	Particulate Matter greater than 2.5 microns and less than 10 microns removed annually	19,366.28 USD	±934.92	9.66 T	±0.47
CO2seq	Carbon Dioxide sequestered annually in trees	149,713.64 USD	±7,227.51	4,246.55 T	±205.00
CO2stor	Carbon Dioxide stored in trees (Note: this benefit is not an annual rate)	3,915,979.41 USD	±189,046.05	111,074.67 T	±5,362.19

i-Tree Canopy Annual Tree Benefit Estimates based on these values in lbs/acre/yr and USD/T/yr: CO 1.139 @ 434.17 USD | NO2 7.157 @ 166.07 USD | O3 60.999 @ 1,233.17 USD | PM2.5 1.921 @ 43,896.11 USD | SO2 1.732 @ 45.30 USD | PM10 21.872 @ 2,011.14 USD | CO2seq 9,611.214 @ 35.38 USD | CO2stor is a total biomass amount of 251,395.359 @ 35.38 USD*
Note: Currency is in USD
Note: Standard errors of removal amounts and benefits were calculated based on standard errors of sampled and classified points.

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.

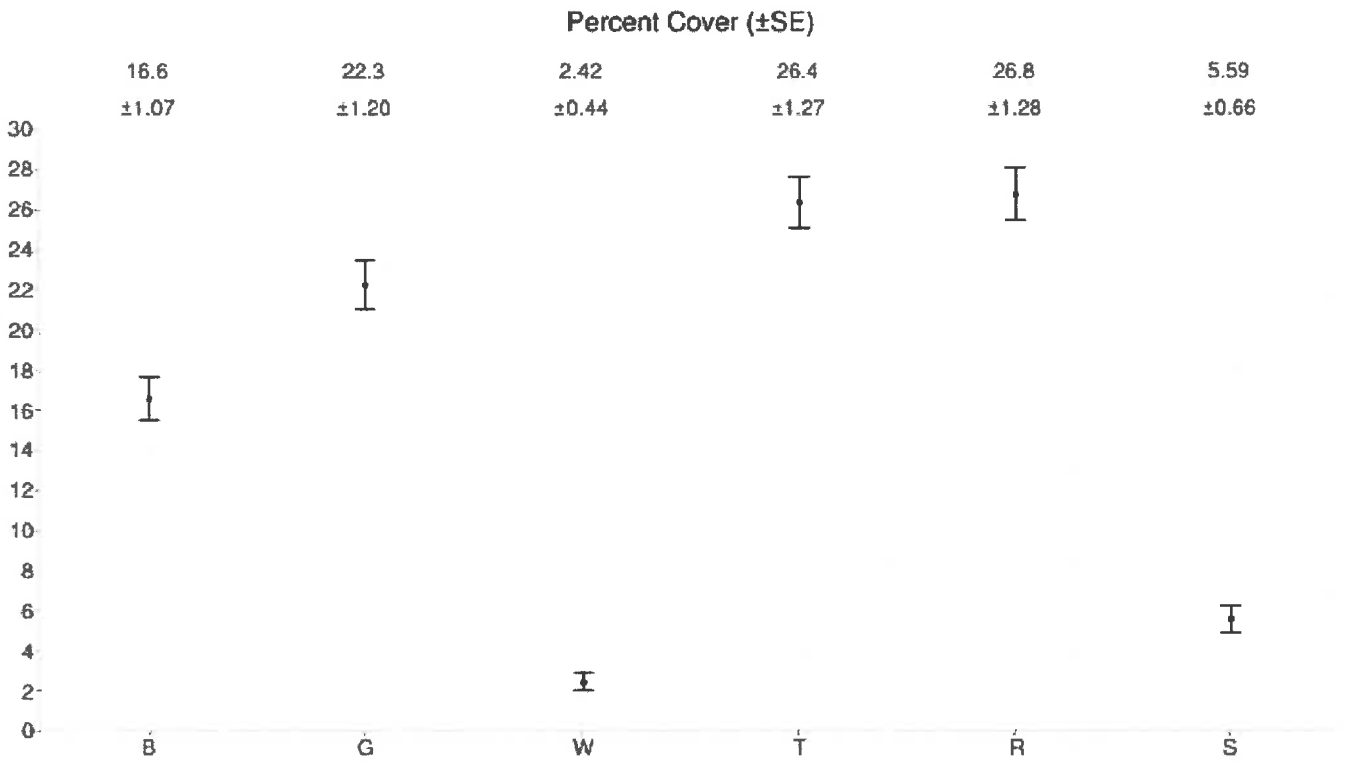
A Cooperative Initiative Between:

www.itreetools.org

i-Tree Canopy v6.1

Cover Assessment and Tree Benefits Report

Estimated using random sampling statistics on 1/03/19



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Grass	Grass, Fields	G	267	22.3 ±1.20
Water	All waterways	W	29	2.42 ±0.44
Tree/Shrub	Trees, Shrubs, other landscaping	T	316	26.4 ±1.27
Impervious Roads	Roads, sidewalks	R	321	26.8 ±1.28
Soil/Sand	Soil, Sand, Bare ground	S	67	5.59 ±0.66

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