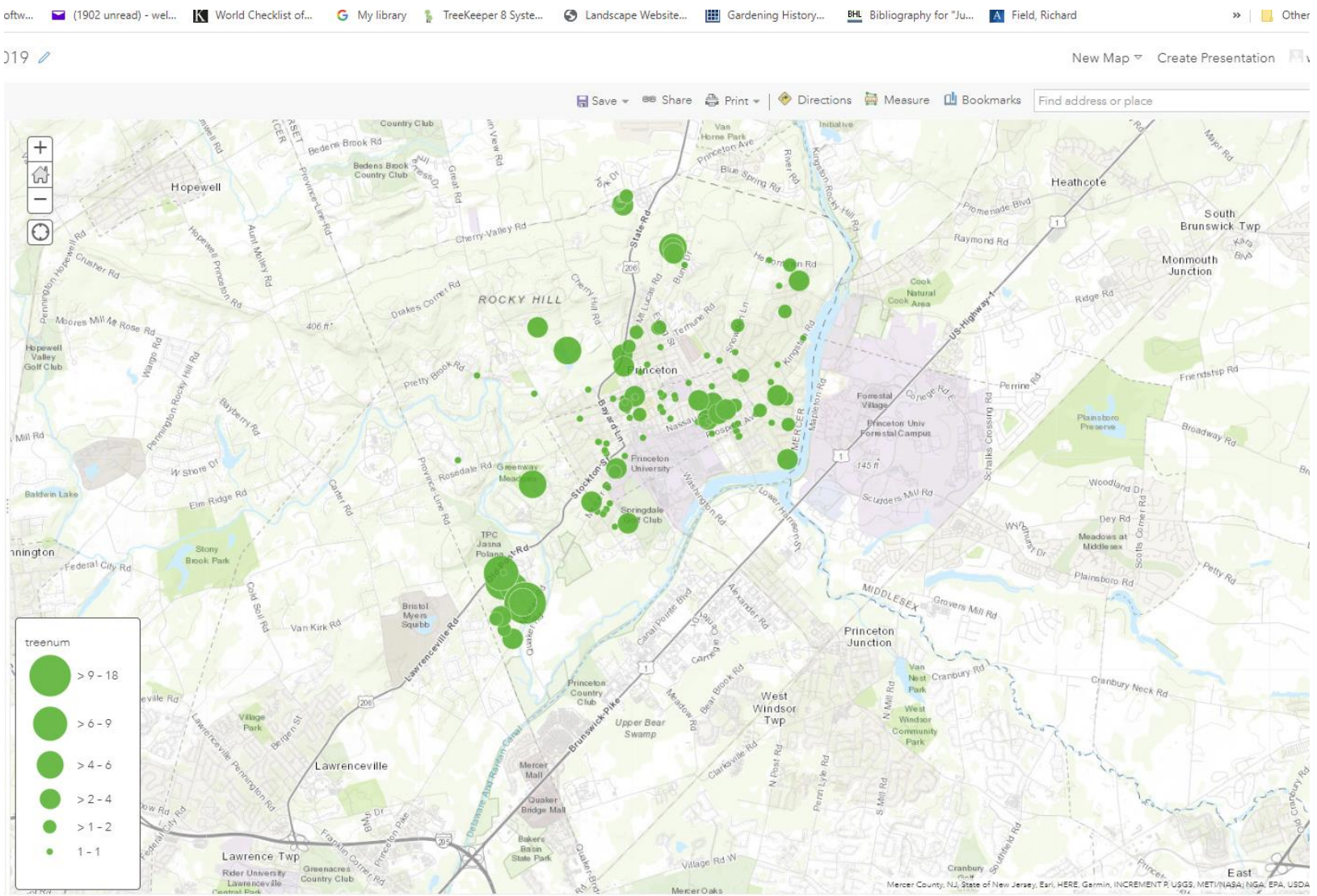
Current and Future Municipal Tree Planting Strategies in Princeton

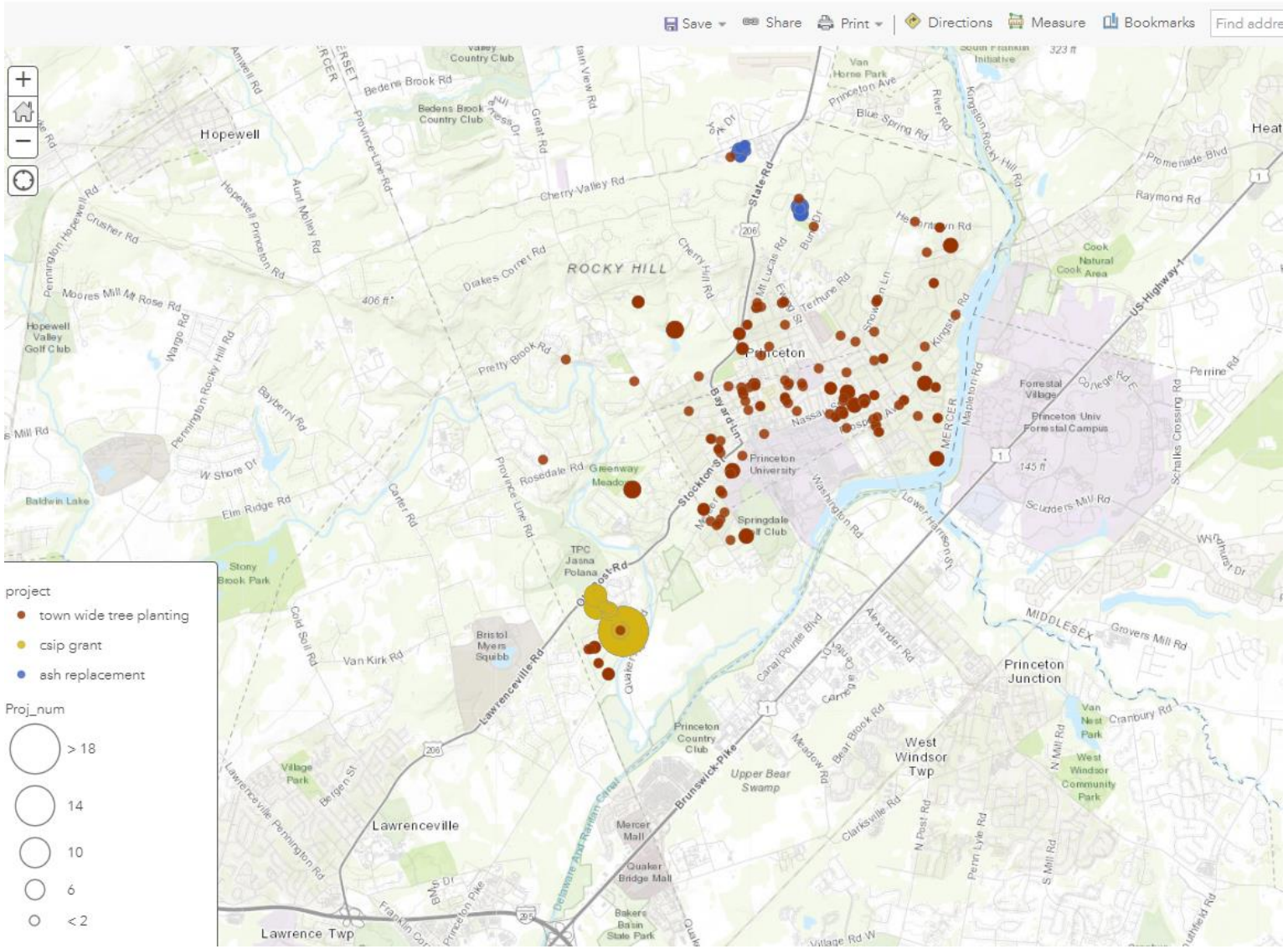
Current Tree planting Strategies and Benefits
Municipal trees planted 2018-2019

Location of Municipal Trees Planted 2018-2019 (N=293)



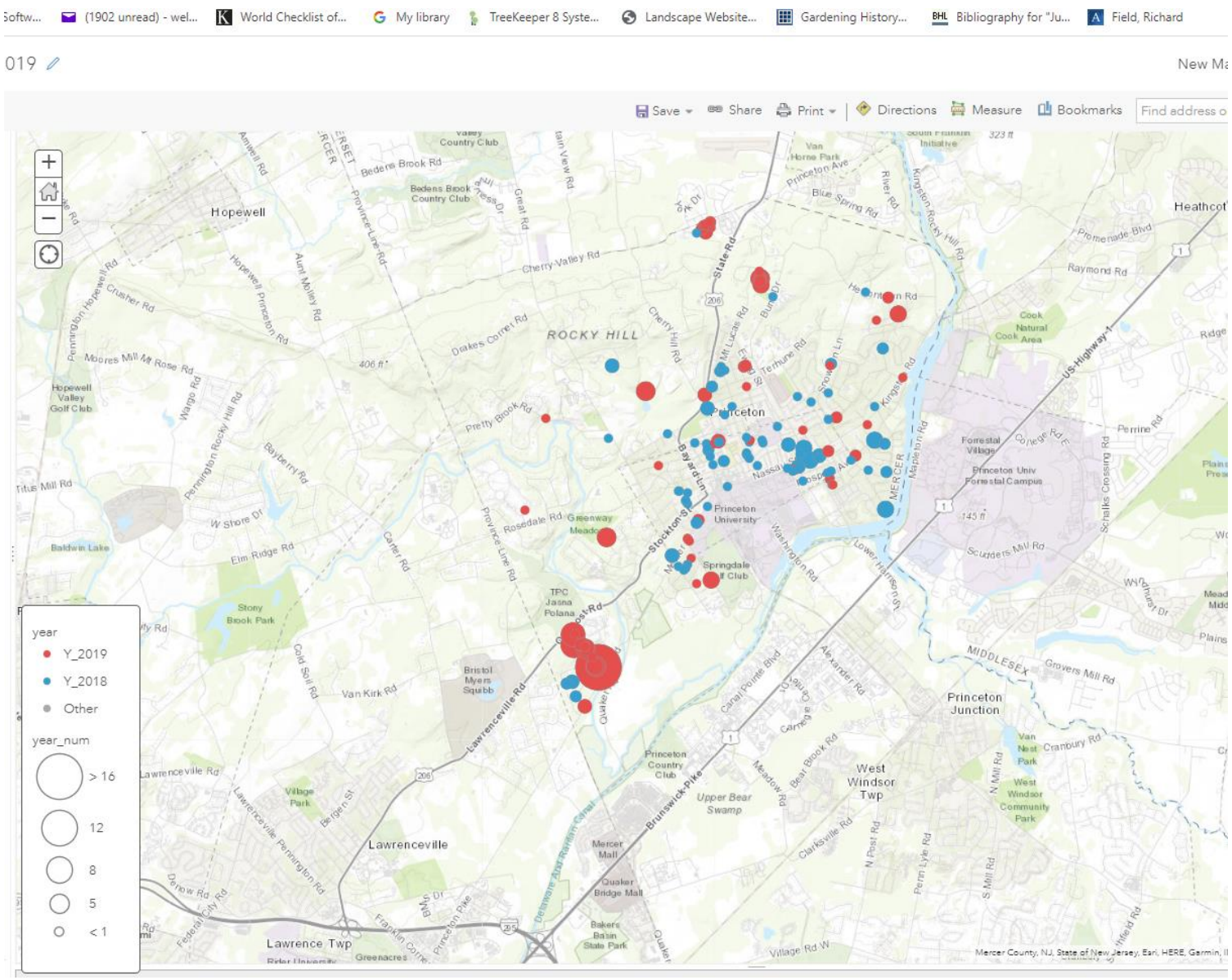
Some clustering of trees in southern part of town

Municipal Trees Planted 2018-2019 by Project



Trees planted at the request of homeowners adjacent to their properties (town-wide planting) , as part of restoration projects (ash replacement), or in clusters where they could be easily tracked (csip grant)

Municipal Trees 2018-2019 by Year planted



More town-wide planting in 2018 than 2019

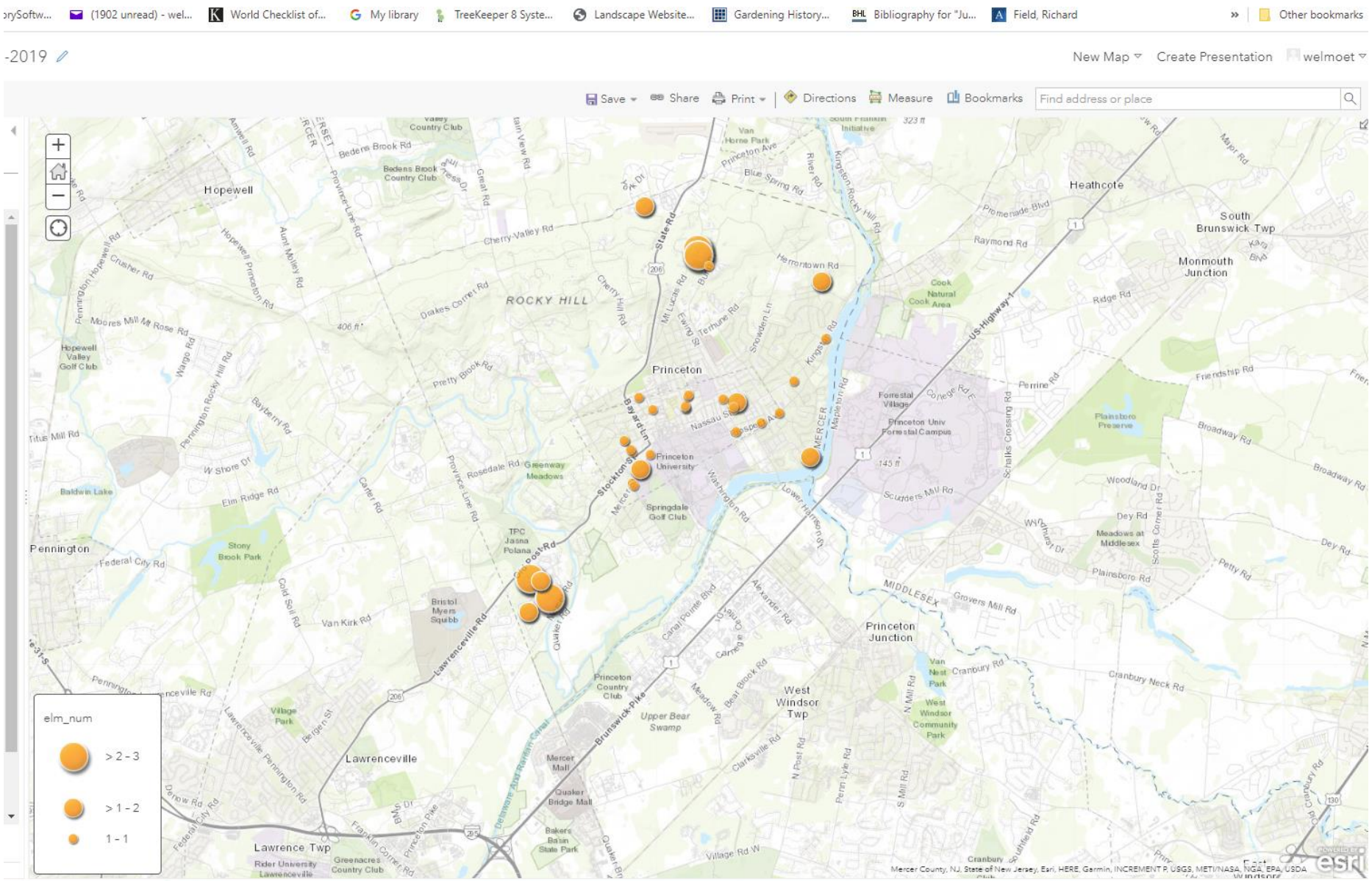
Tree Species of Municipal Tree Planted 2018- 2019 by Frequency

Importance Values by Species

Location: Princeton, Mercer, New Jersey, United States of America
Project: Princeton new tree planting version 2, Series: 2018-2019, Year: 2020
Generated: 3/30/2020

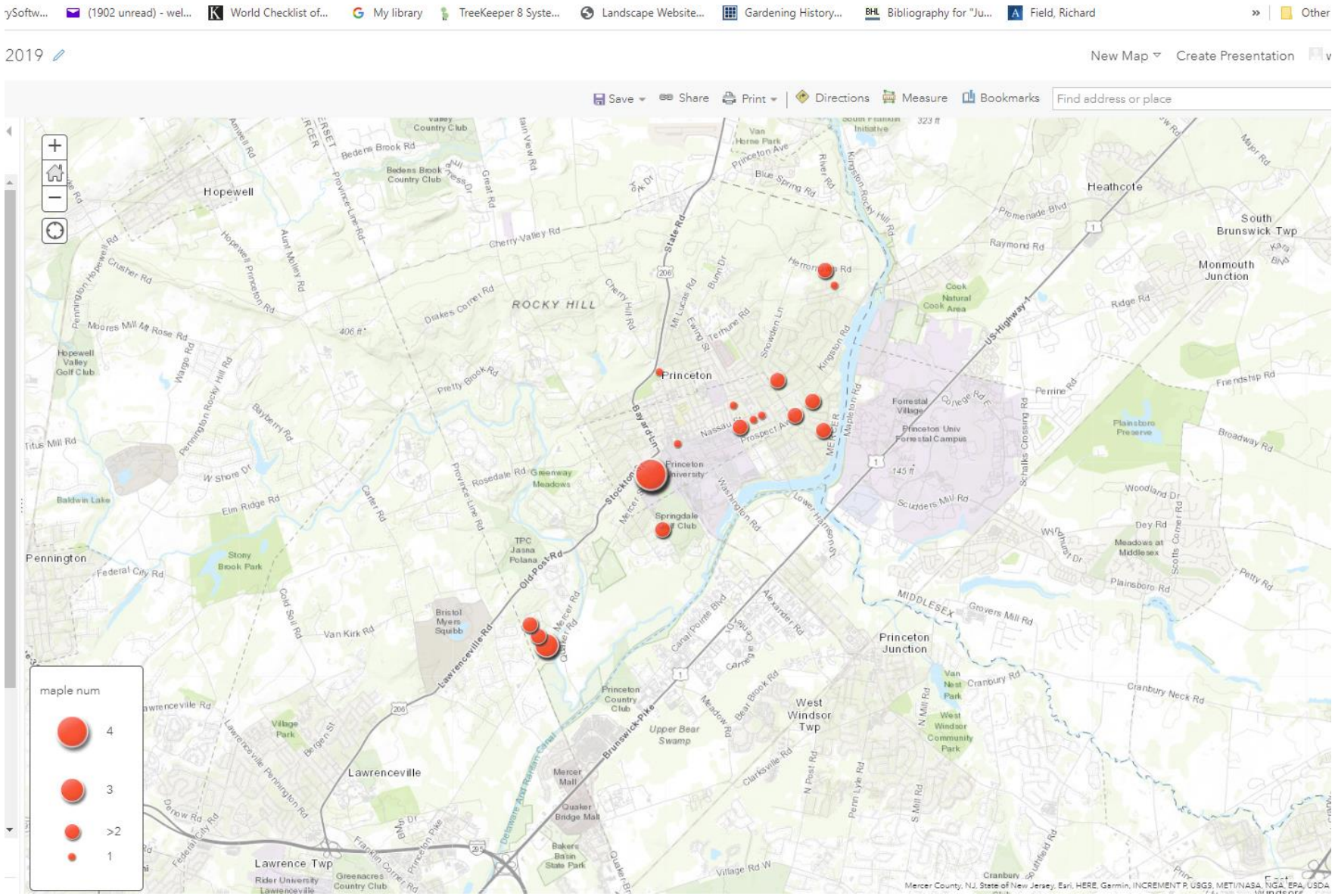
Species	Percent Population	Percent Leaf Area	Importance Value
elm spp	17.1	17.9	34.9
dogwood spp	10.2	11.2	21.4
Red maple	7.8	9.6	17.5
European hornbeam	4.4	7.8	12.3
redbud spp	5.8	6.0	11.8
magnolia spp	4.1	5.5	9.6
sweetgum spp	5.5	3.8	9.2
serviceberry spp	4.8	2.9	7.7
Hedge maple	2.7	3.5	6.3
London plane	3.1	3.1	6.2
Northern red oak	3.1	3.0	6.1
hackberry spp	2.4	3.2	5.6
Black gum	4.4	0.6	5.0
maackia spp	2.4	2.5	4.9
Kentucky coffeetree	1.7	2.0	3.7
crabapple	1.7	1.8	3.5
Ginkgo	2.0	1.5	3.5
tupelo spp	1.7	1.7	3.4
Black cherry	1.7	1.6	3.3
Japanese tree lilac	2.4	0.9	3.3
London planetree	1.4	1.9	3.3
Okame cherry	1.7	1.5	3.2
Persian ironwood	1.7	1.3	3.0
River birch	1.4	1.3	2.7
yellowwood spp	1.4	1.1	2.5
Dawn redwood	1.0	0.6	1.6
Goldenrain tree	0.7	0.7	1.4
zelkova spp	0.7	0.5	1.2
Paperbark maple	0.3	0.4	0.8
holly spp	0.3	0.3	0.6
Thornless honeylocust	0.3	0.2	0.6

Location of Elm Trees Planted 2018-2019



Elm trees clustering in some areas

Location of Maple Trees Planted 2018-2019



Maples clustering in some areas

Assumptions for Tree Benefit Calculation
Municipal Trees Planted 2018-2019

- 10% tree mortality per year
- 165 days frost free (Trenton Weather Station)
- Average rainfall (Trenton weather Station)
- Urban tree environment – Street trees
- Location of tree (address)
- Benefits calculated for 20-year and 30-year period
- Tree species

Expected Mortality Rate of Trees Planted 2018-2019
Over a 20-year Period

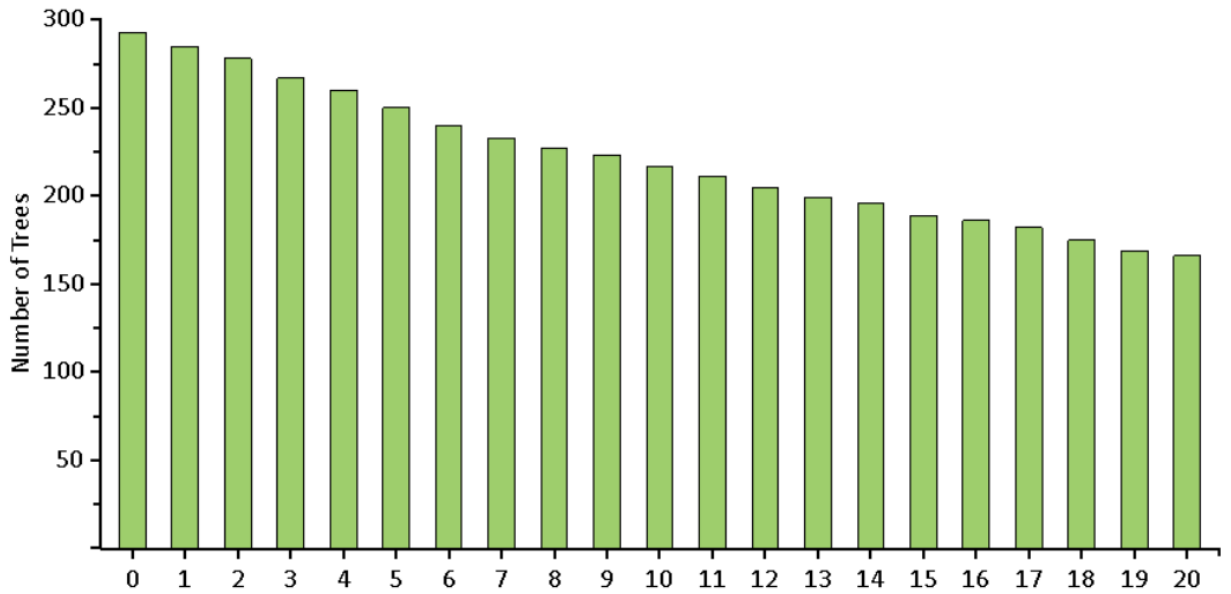
recast > Reports > Composition and Structure > Population Summary > Number of Trees

121.7% Page 1 of 2

Number of Trees Over Time

Location: Princeton, Mercer, New Jersey, United States of America
Project: PLANTING PROJECT VERSION 2, Series: VERSION 2, Year: 2020, Forecast: Default
Generated: 1/28/2020

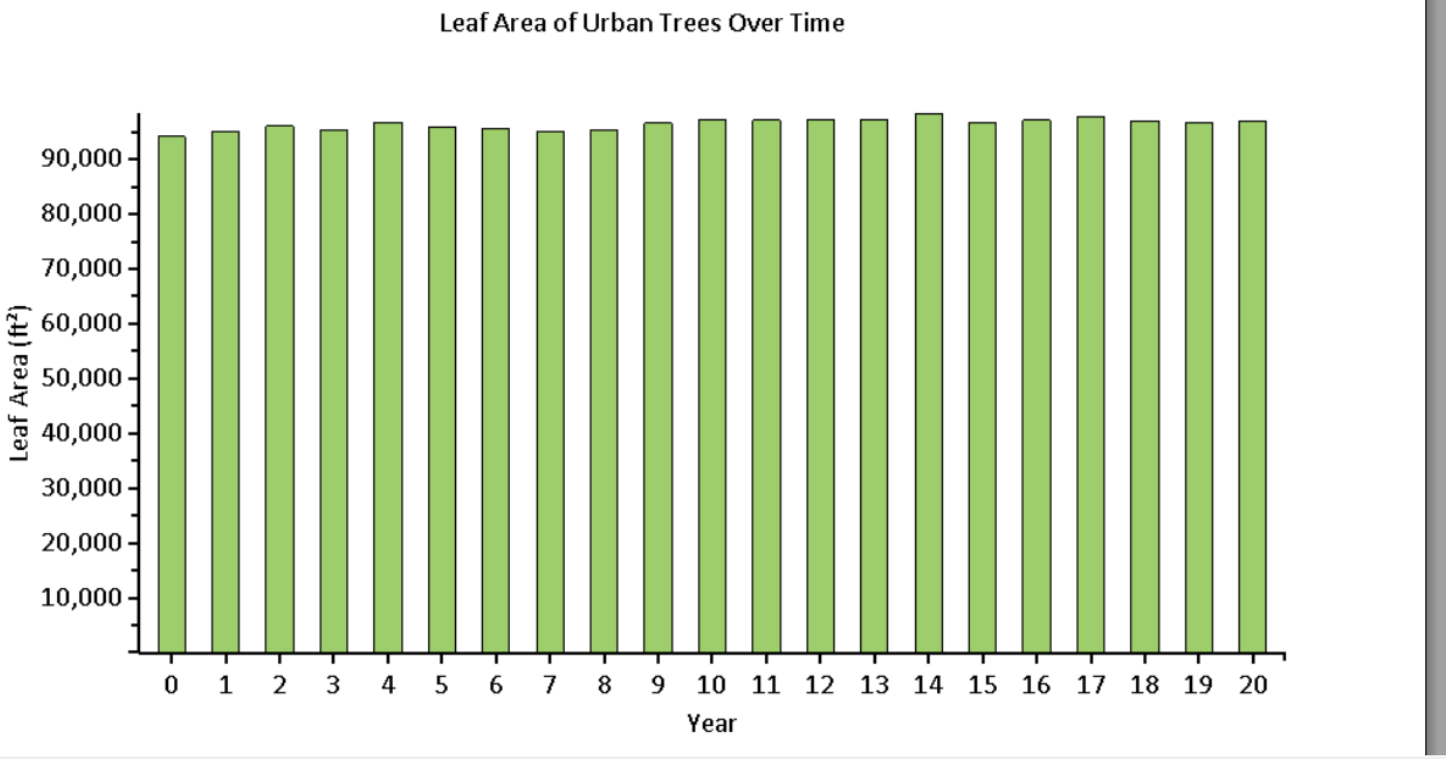
i-Tree Eco



Leaf Area Change for Trees Planted 2018-2019
Over a 30-Year Period

Leaf Area Over Time by Stratum

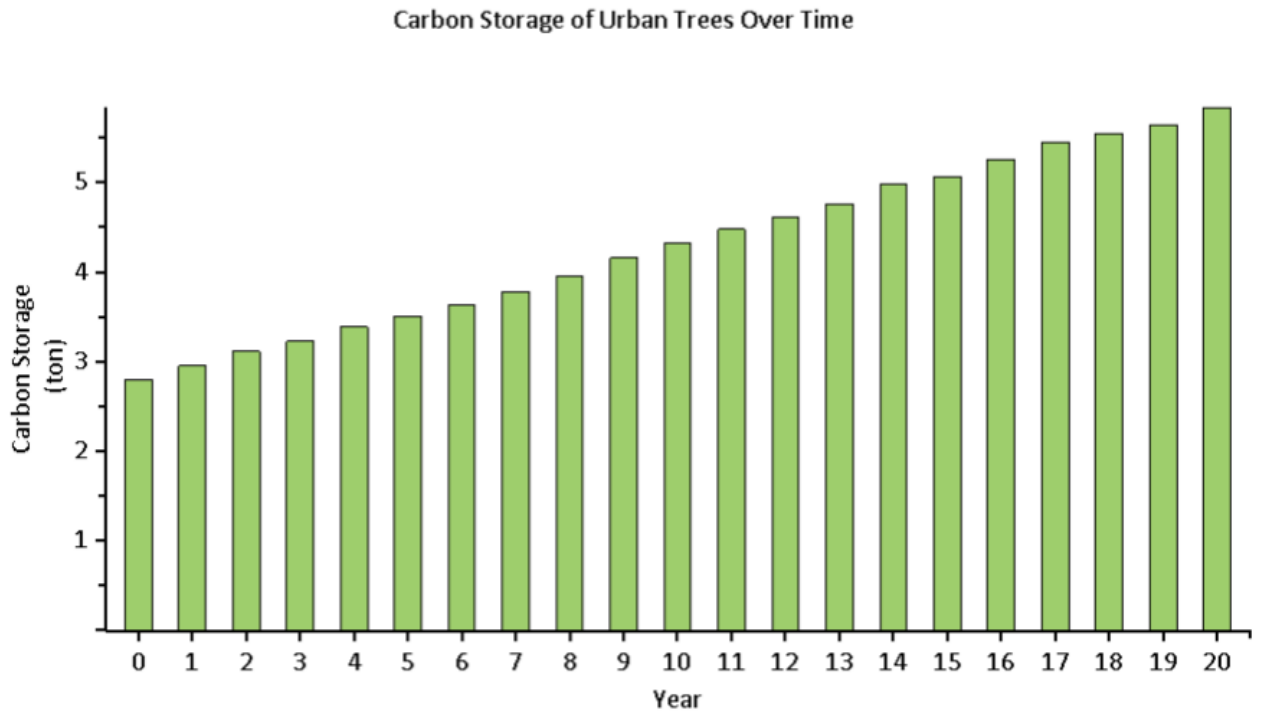
Location: Princeton, Mercer, New Jersey, United States of America
Project: PLANTING PROJECT VERSION 2, Series: VERSION 2, Year: 2020, Forecast: Default
Generated: 1/28/2020



Carbon storage of Trees Planted 2018-2019
Over 20 Years

Carbon Storage Over Time by Stratum

Location: Princeton, Mercer, New Jersey, United States of America
Project: PLANTING PROJECT VERSION 2, Series: VERSION 2, Year: 2020, Forecast: Default
Generated: 1/27/2020

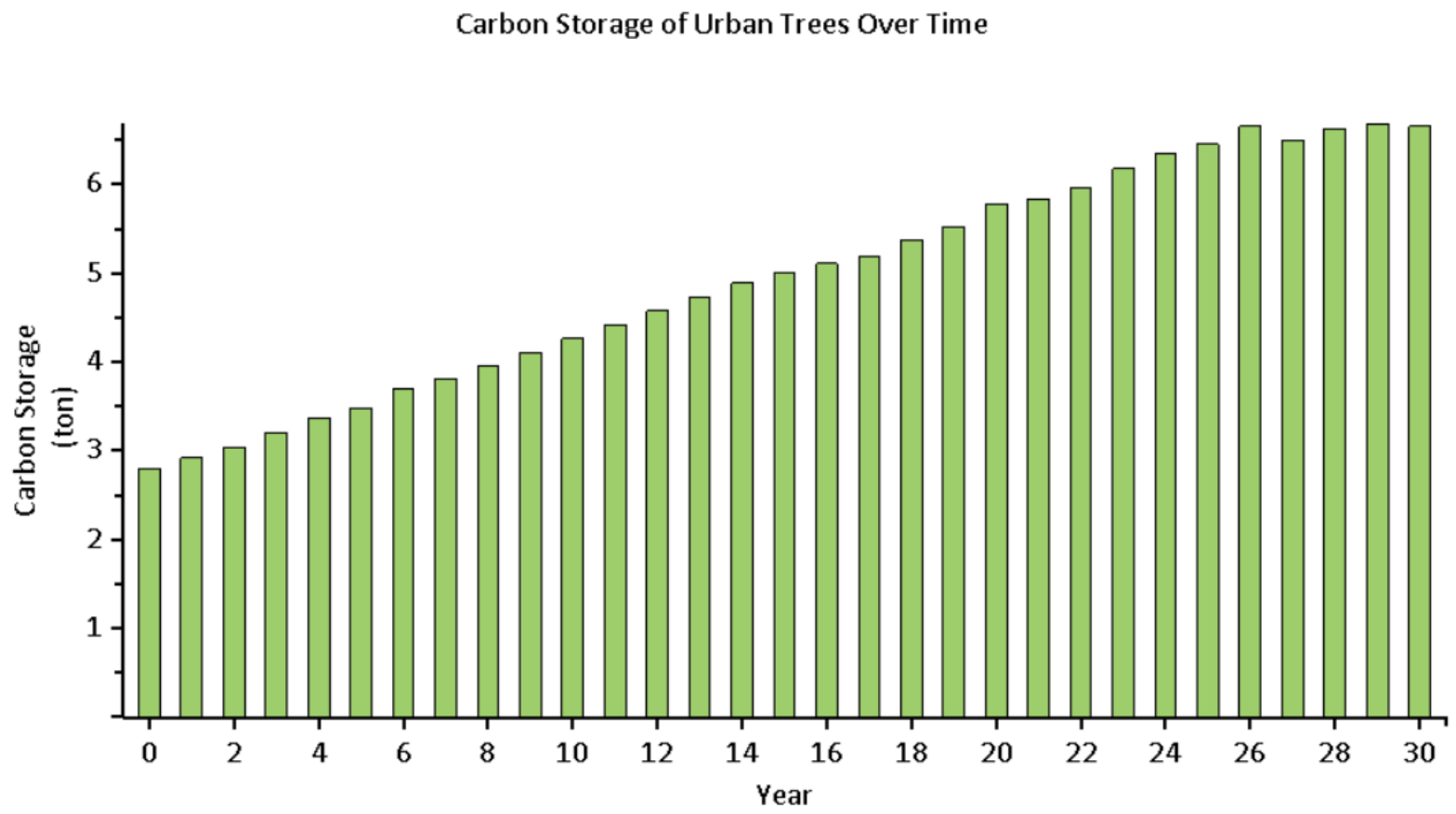


Carbon storage of Trees Planted 2018-2019
Over 30 Years

Carbon Storage Over Time by Stratum

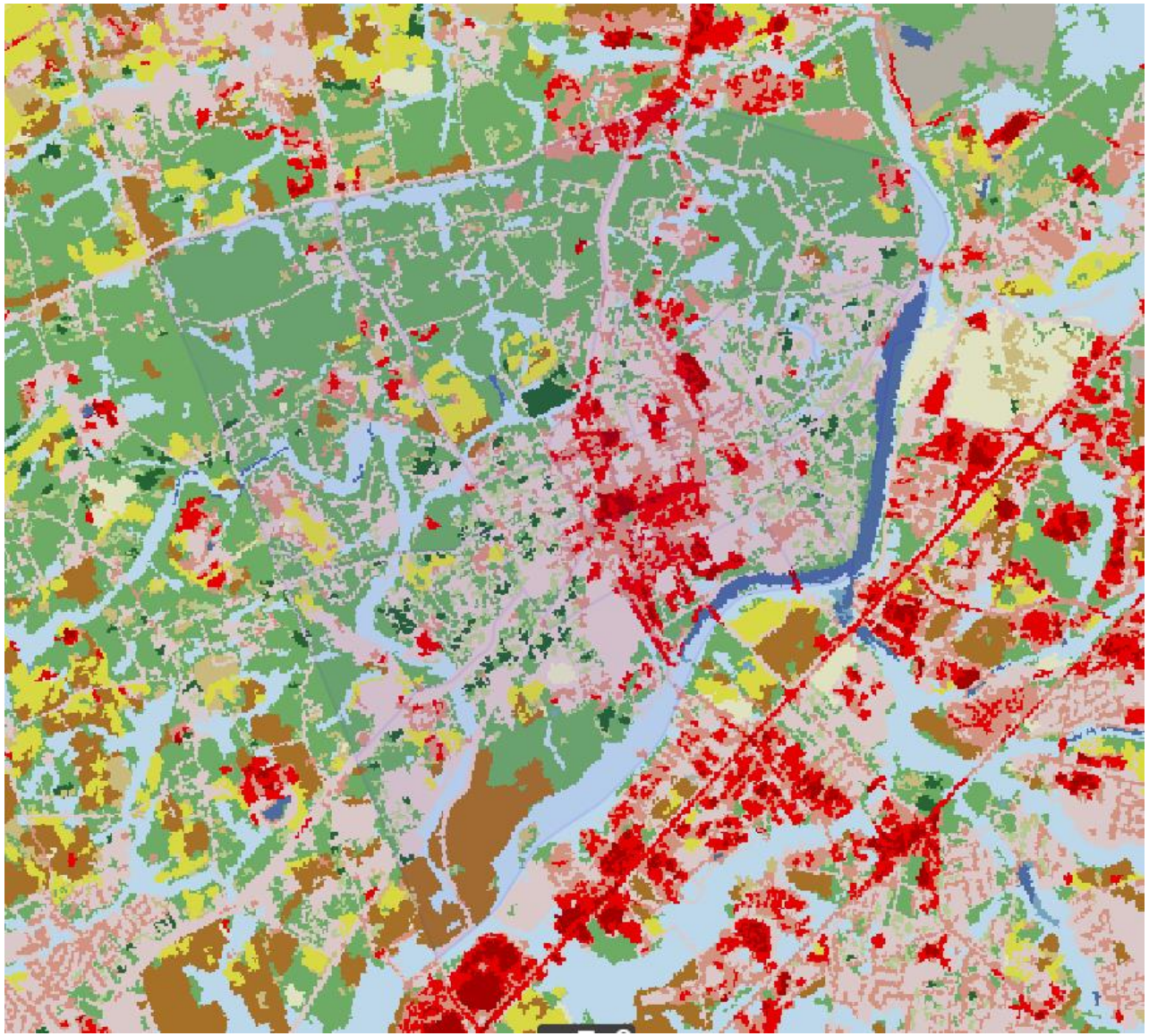
Location: Princeton, Mercer, New Jersey, United States of America
Project: PLANTING PROJECT VERSION 2, Series: VERSION 2, Year: 2020, Forecast: Default_1
Generated: 1/28/2020

i-Tree Eco



Identify Areas for Future Tree Planting

Land Cover Data Princeton (2011)



Land Cover Classifications

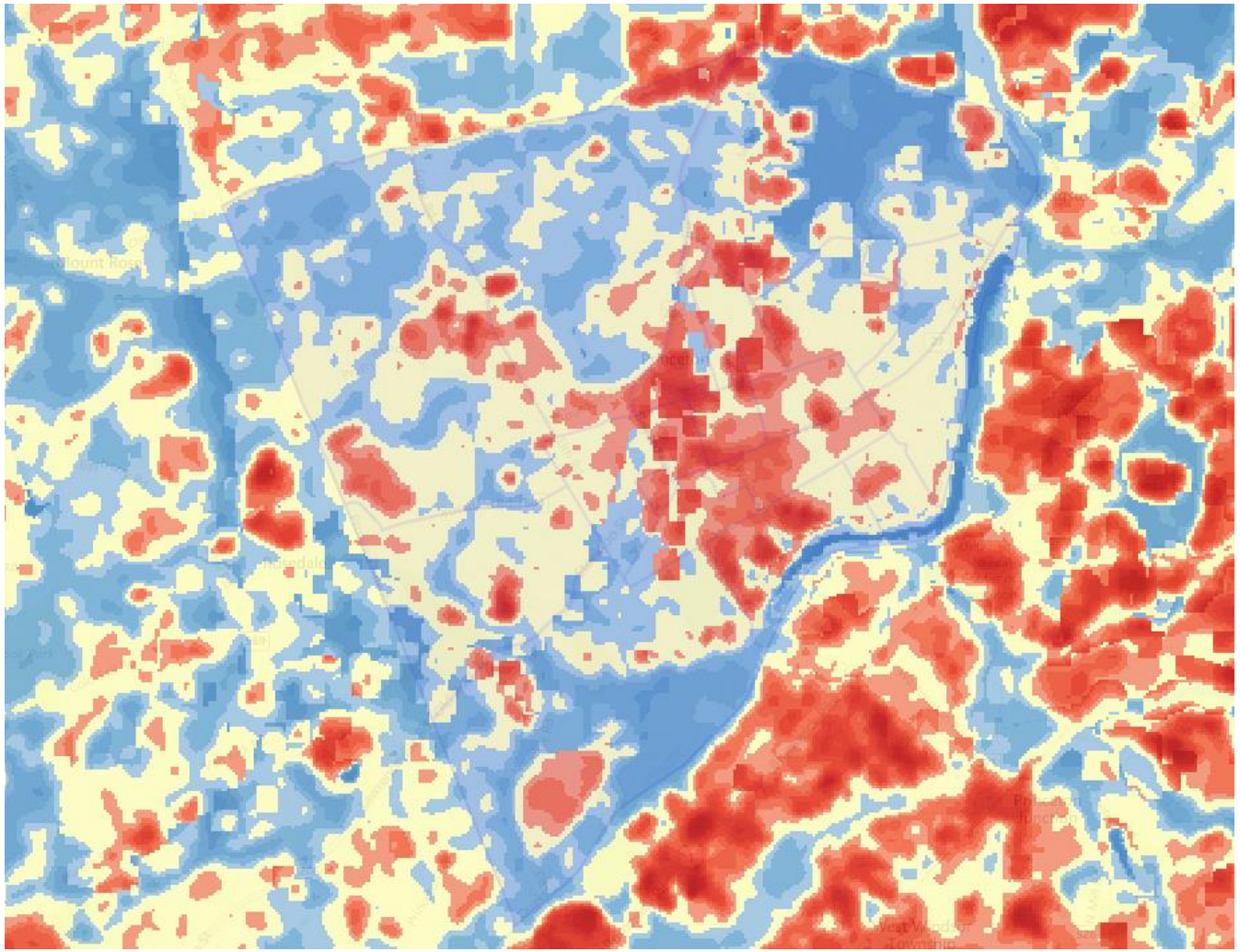
High Resolution, Urban Tree Canopy

Other	Meters squared of other
Tree	Meters squared of tree
Grass/Shrub	Meters squared of grass/shrub
Bare Earth	Meters squared of bare earth
Water	Meters squared of water
Building	Meters squared of building
Road	Meters squared of road
Other Paved	Meters squared of other paved
Agriculture	Meters squared of agriculture
Wetland	Meters squared of wetland

National Land Cover Database

Developed, Open Space	Areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.
Developed, Low Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single-family housing units.
Developed, Medium Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of the total cover. These areas most commonly include single-family housing units.
Developed, High Intensity	Highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.
Deciduous Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change.
Evergreen Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.

Land Surface Temperature Difference Data for Princeton

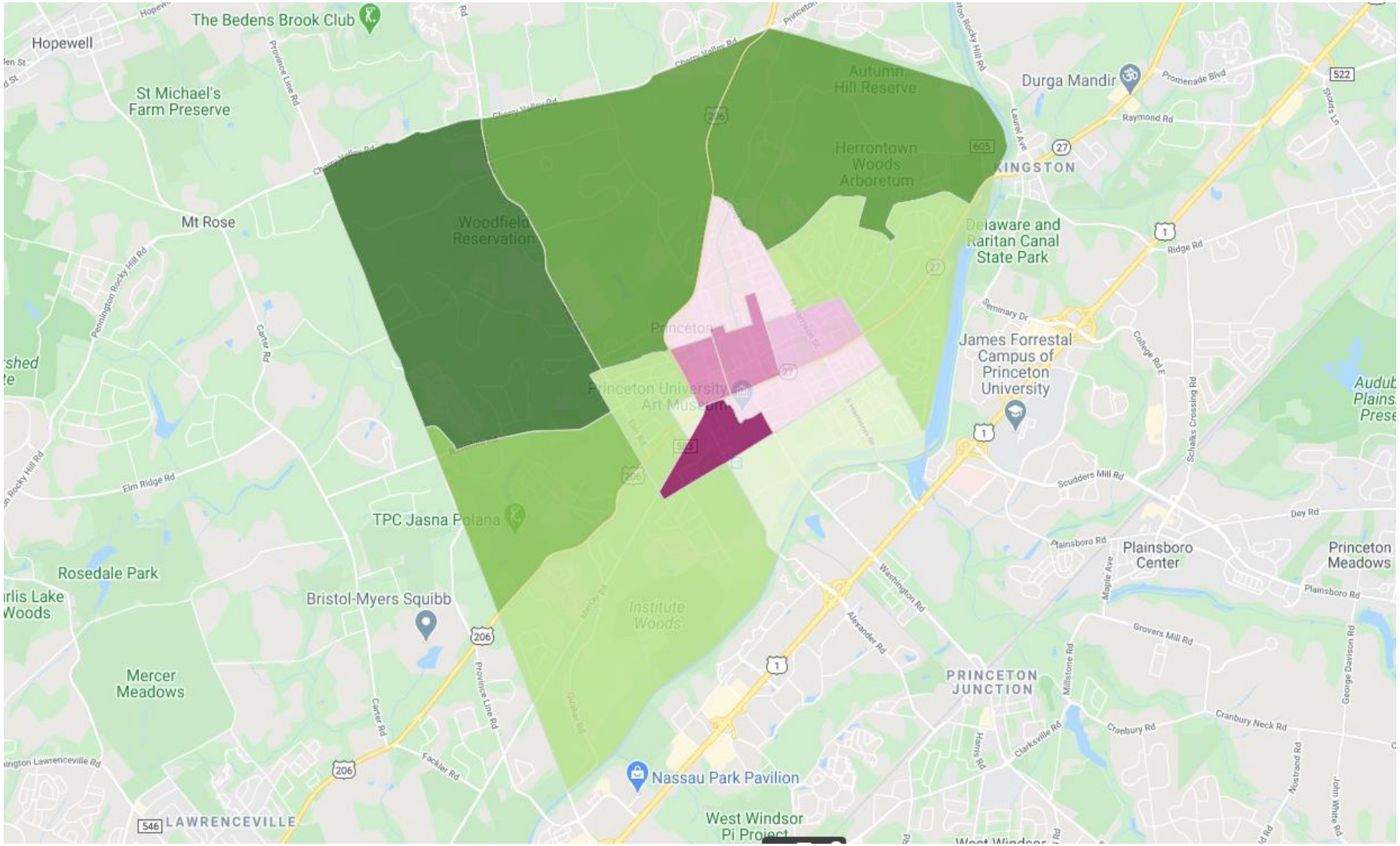


Land Surface Temperature Difference

Δ -20 °C : (-36.0 °F)
Δ -16 °C : (-28.8 °F)
Δ -8 °C : (-14.4 °F)
Δ -4 °C : (-7.2 °F)
Δ -2 °C : (-3.6 °F)
Δ < 0 °C : (< 0.0 °F)
Δ 0 °C : (0.0 °F)
Δ > 0 °C : (> 0.0 °F)
Δ 2 °C : (3.6 °F)
Δ 4 °C : (7.2 °F)
Δ 8 °C : (14.4 °F)
Δ 16 °C : (28.8 °F)
Δ 20 °C : (36.0 °F)

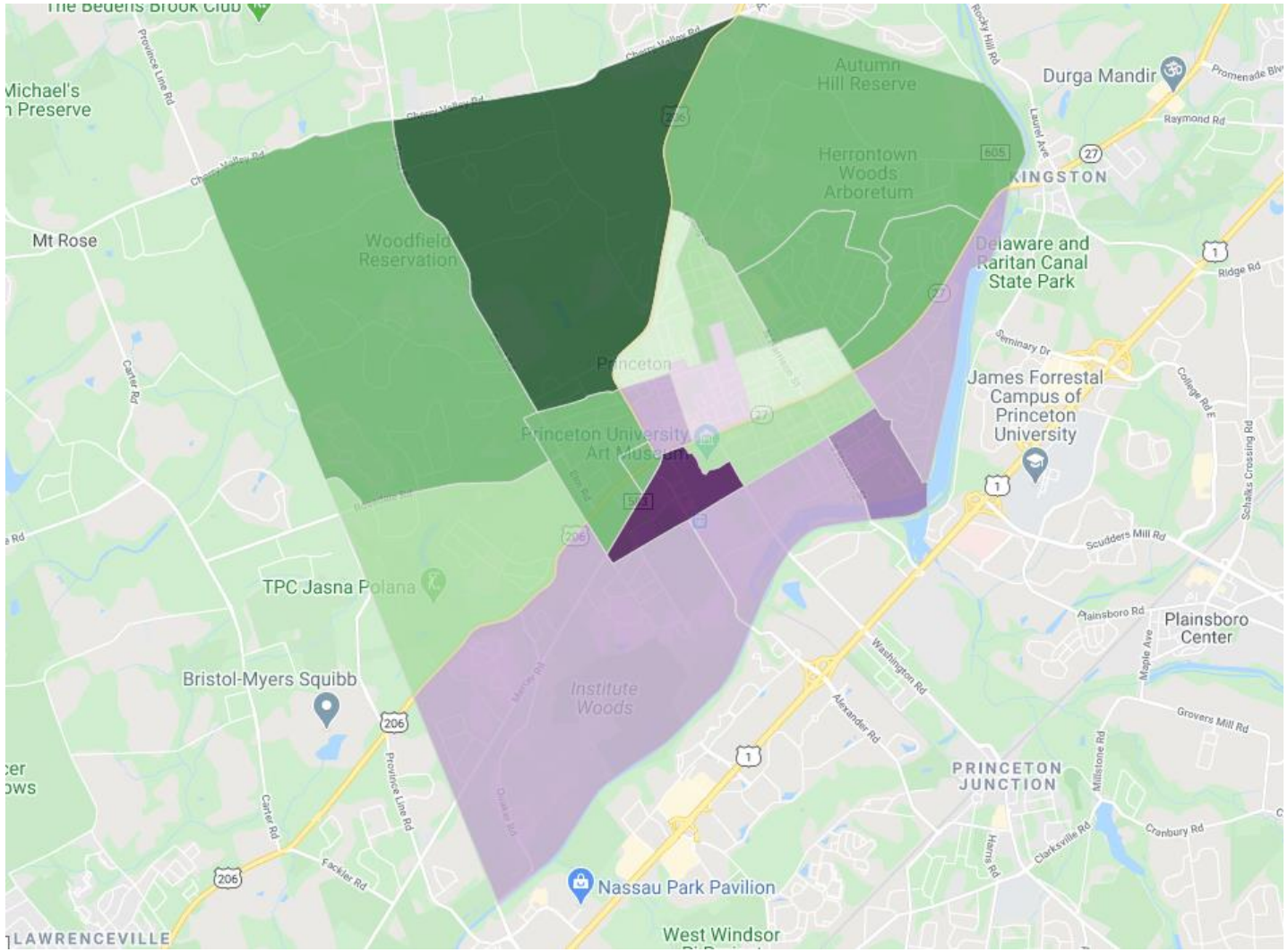
Land Surface Temperature Difference data derived from Landsat-8 Thermal Infrared Sensor Data. Temperature values are the difference from the median surface temperature for each Landsat scene - landsat.usgs.gov.

Census Block Areas Identified for Priority Trees Planting
Prioritizing Population Density



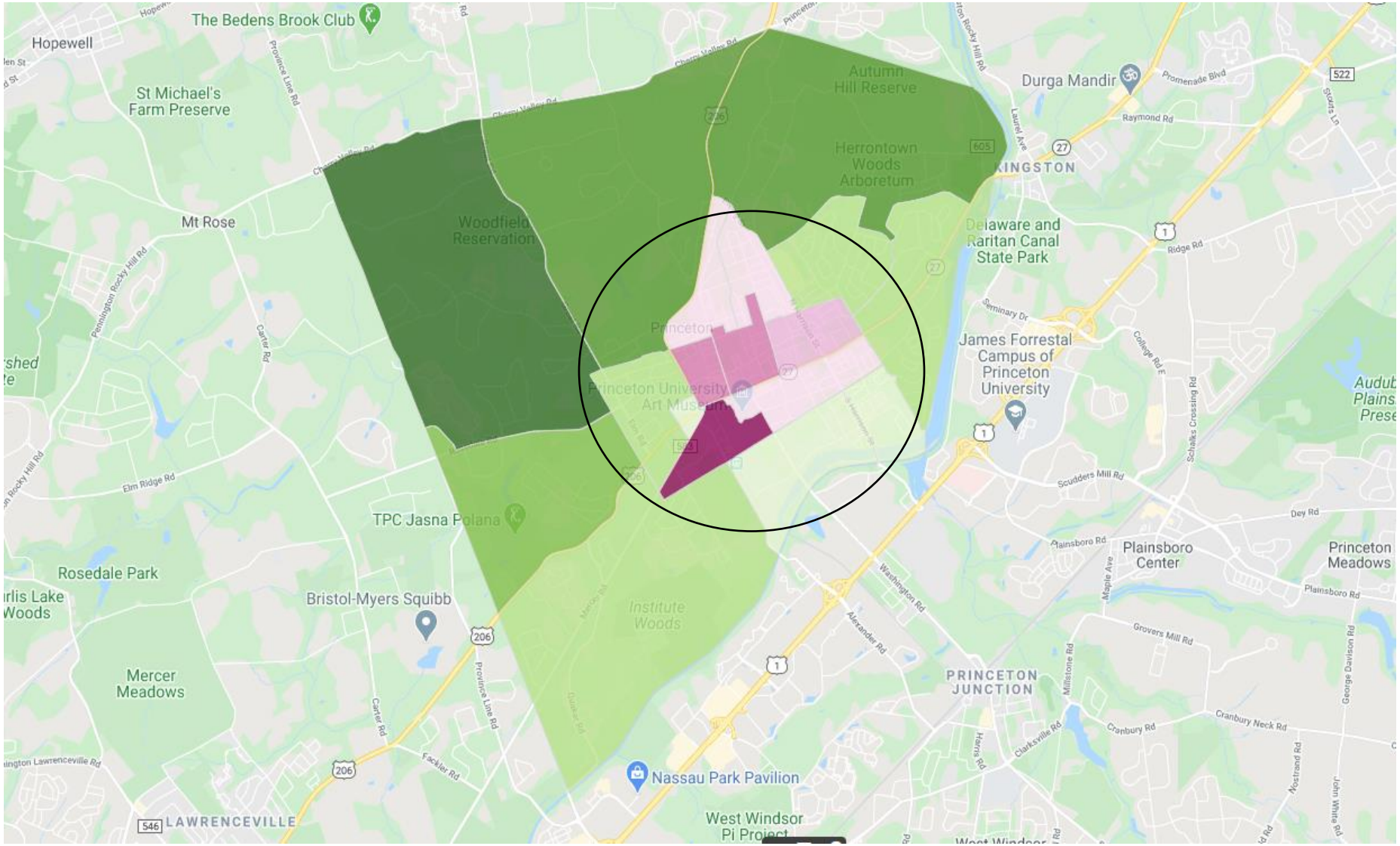
Dark pink indicates where tree planting would be most beneficial/dark green where trees would be the least beneficial

Census Area Identified for Priority Trees Planting
Prioritizing benefits for Impaired Waterways



Dark purple indicates where tree planting would be most beneficial/dark green where trees would be the least beneficial

High Priority Area for Future Tree Planting



Dark pink indicates where tree planting would be most beneficial/dark green where trees would be the least beneficial

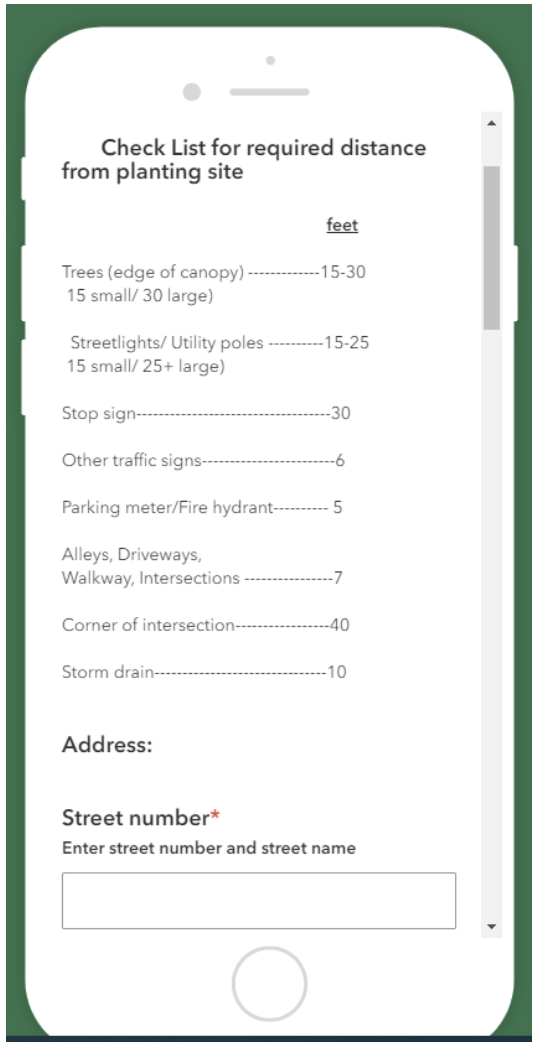
Characteristics of Circled Priority Area

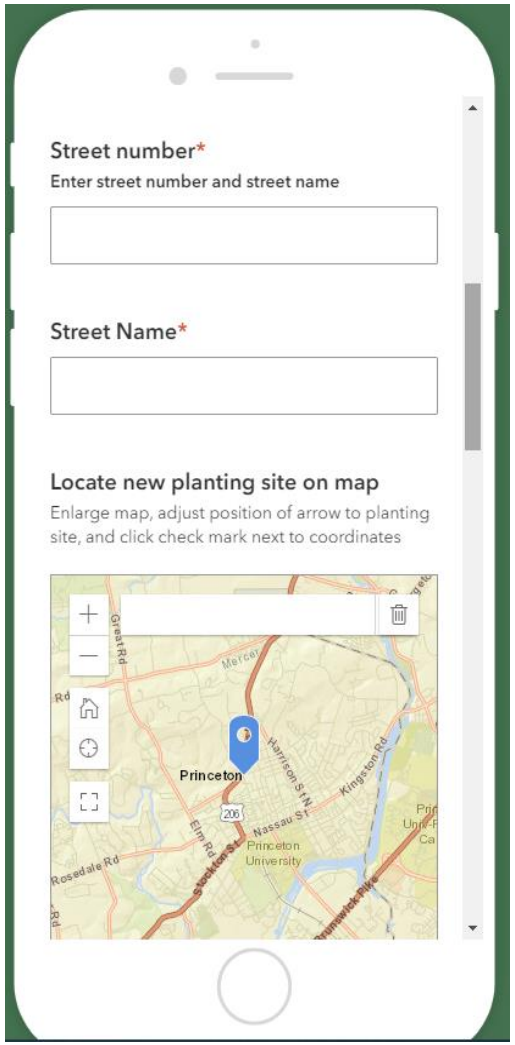
- Downtown area
- Tree-lined streets with side walks and tree lawns
- Small-size lots
- High density of shops/ restaurants
- On street parking
- Pedestrian traffic

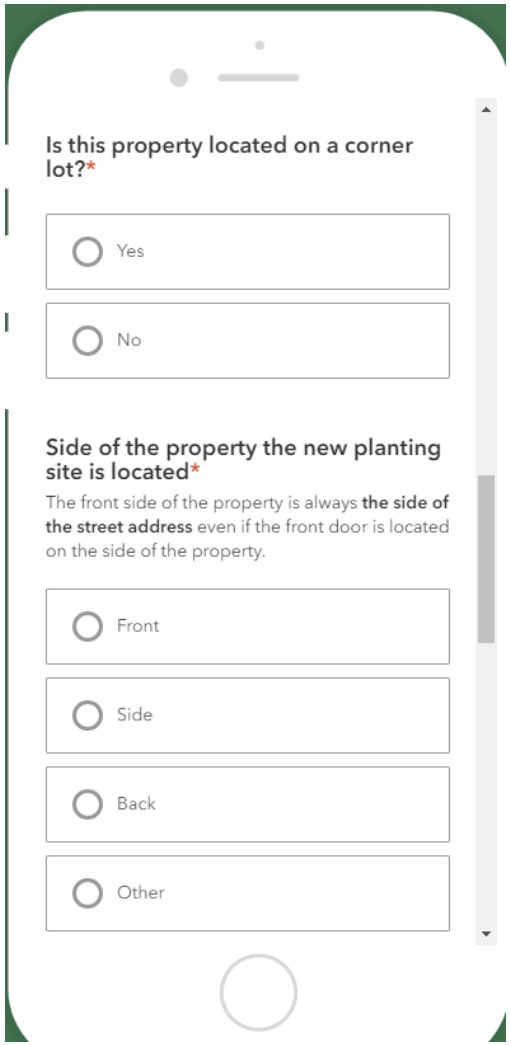
Citizen's Participation in Finding Sites for Future Tree Planting in High Priority Area

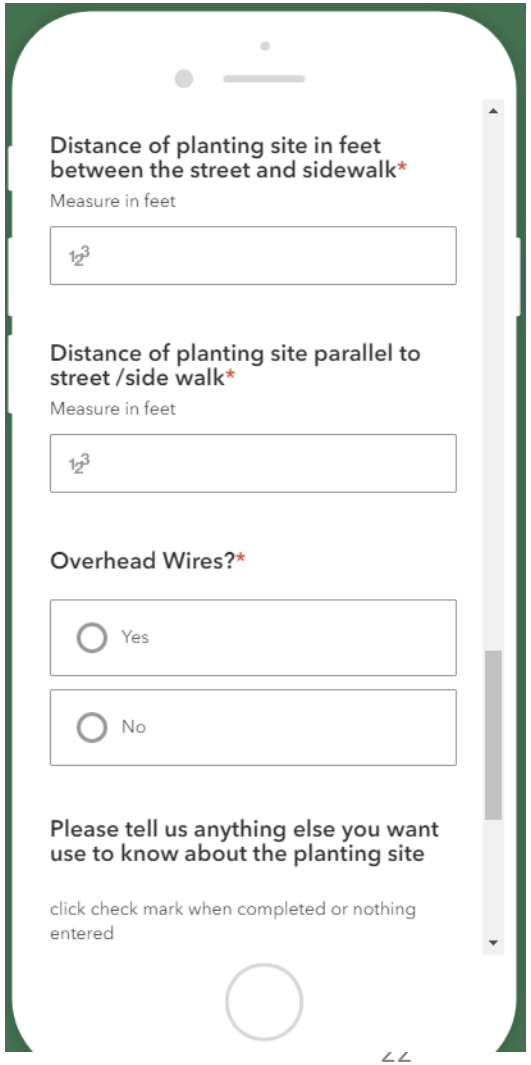
Building a mobile app for cell phone or tablet to collect information

App for Citizens to Identify Planting Sites
To Download: link=https://arcg.is/1XXD0D

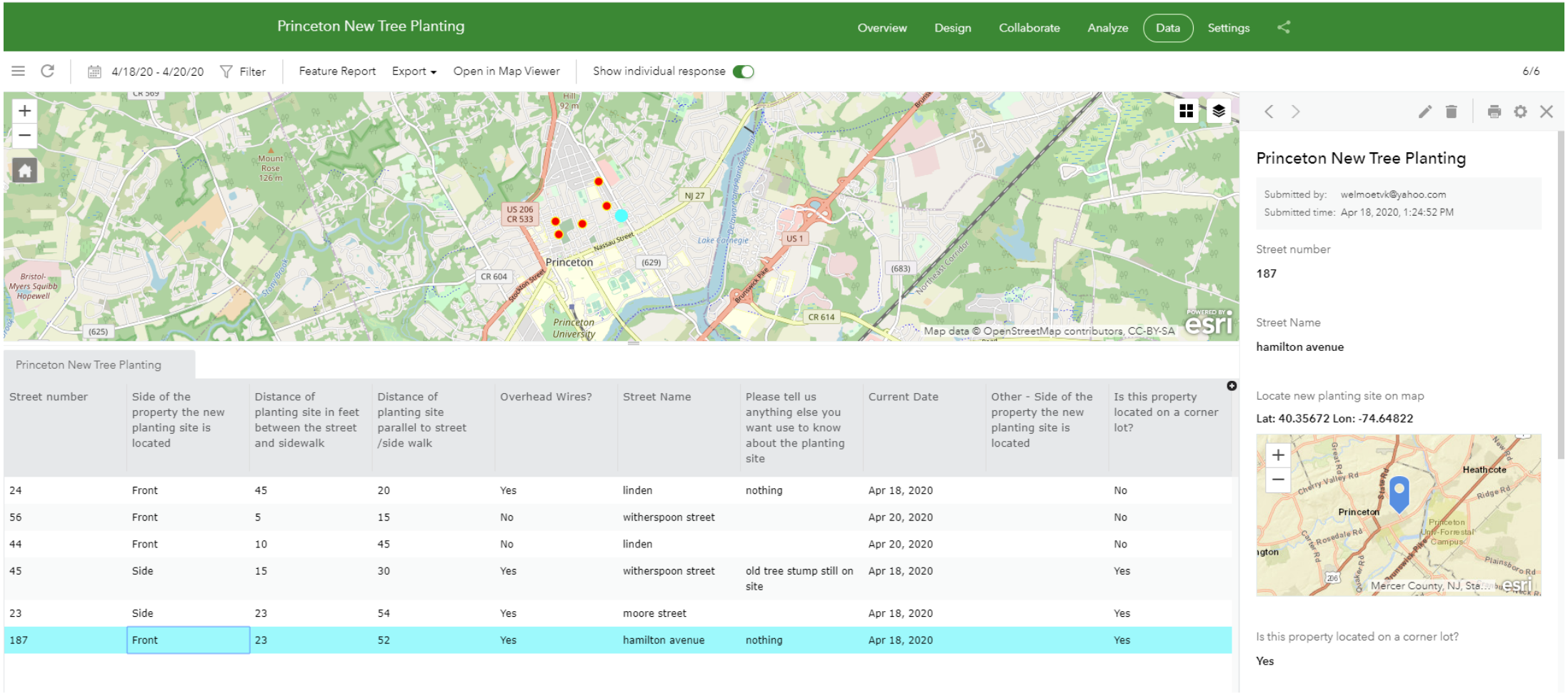








Data Can Be Viewed for Further Inspection and Analysis



Princeton New Tree Planting

Street number	Side of the property the new planting site is located	Distance of planting site in feet between the street and sidewalk	Distance of planting site parallel to street /side walk	Overhead Wires?	Street Name	Please tell us anything else you want use to know about the planting site	Current Date	Other - Side of the property the new planting site is located	Is this property located on a corner lot?
24	Front	45	20	Yes	linden	nothing	Apr 18, 2020		No
56	Front	5	15	No	witherspoon street		Apr 20, 2020		No
44	Front	10	45	No	linden		Apr 20, 2020		No
45	Side	15	30	Yes	witherspoon street	old tree stump still on site	Apr 18, 2020		Yes
23	Side	23	54	Yes	moore street		Apr 18, 2020		Yes
187	Front	23	52	Yes	hamilton avenue	nothing	Apr 18, 2020		Yes