City Of Gainesville Request For Proposal: #PWDA-230046-DH

Ecological Analysis and Tree Inventory

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BID COVER

City of Gainesville

Procurement Division
(352) 334-5021(main)

Issue Date: May 26, 2023

REQUEST FOR PROPOSAL: #PWDA-230046-DH
Ecological Analysis and Tree Inventory

PRE-PROPOSAL MEETING: ☒ **Non-Mandatory** ☐ **Mandatory** ☐ **N/A** ☐ **Includes Site Visit**
DATE: June 8, 2023 TIME: 9:00 am
LOCATION: Smokey Bear Park (2300 NE 15th St Gainesville, FL 32609)

QUESTION SUBMITTAL DUE DATE: June 15, 2023 @ 5:00 pm

All meetings and submittal deadlines are Eastern Time (ET).

DUE DATE FOR UPLOADING PROPOSAL: June 22, 2023 @ 3:00pm

SUMMARY OF SCOPE OF WORK: The purpose of this project will be to complete an ecological analysis of the City of Gainesville's (CITY) urban forest, public and private; complete a detailed tree inventory of all City of Gainesville owned trees, and to estimate change in the overall canopy coverage in Gainesville from 1995 -2023.

For questions relating to this solicitation, contact: Diane Holder, holderds@gainesvillefl.gov

Bidder is not in arrears to City upon any debt, fee, tax or contract: ☒ Bidder is NOT in arrears ☐ Bidder IS in arrears
Bidder is not a defaulter, as surety or otherwise, upon any obligation to City: ☒ Bidder is NOT in default ☐ Bidder IS in default

Bidders who receive this bid from sources other than City of Gainesville Procurement Division or DemandStar.com MUST contact the Procurement Division prior to the due date to ensure any addenda are received in order to submit a responsible and responsive offer. Uploading an incomplete document may deem the offer non-responsive, causing rejection.

ADDENDA ACKNOWLEDGMENT: Prior to submitting my offer, I have verified that all addenda issued to date are considered as part of my offer: Addenda received (list all) # ADD#1, ADD#2

Legal Name of Bidder: University of Florida Board of Trustees

DBA: University of Florida

Authorized Representative Name/Title: Nick Pugh, Sponsored Programs Officer

E-mail Address: ufawards@ufl.edu FEIN: 59-6002052

Street Address: 207 Grinter Hall

Mailing Address (if different): P.O. Box 115500

Telephone: (352) 392-9267 Fax: (_____) _____

By signing this form, I acknowledge I have read and understand, and my business complies with all General Conditions and requirements set forth herein; and,

☑ Proposal is in full compliance with the Specifications.

☐ Proposal is in full compliance with the Specifications except as specifically stated and attached hereto.

SIGNATURE OF AUTHORIZED REPRESENTATIVE: Nick Pugh

SIGNER'S PRINTED NAME: Nick Pugh **DATE:** 6/26/23

This page must be completed and uploaded to DemandStar.com with your Submittal.

Technical Proposal

Task 1.0 Project Planning

Team leader Dr. Ryan Klein is very familiar with the data needs to complete both the Ecological Assessment and Inventory.

Dr. Klein has access to all the methodology, and data from the previous project so his team can relocate plots and follow the protocols established to ensure that there is consistency in data collection and analysis for both measurement periods. The protocols developed follow the i-tree approaches with minor modifications to reflect local conditions. These protocols have also been used when completing four similar projects for the City of Tampa (2006, 2011, 2016, 2021). The team will also have access to the protocols and historical imagery that was previously collected for the remote sensing portion of the project (Task 2.0) and will be able to replicate that process to ensure that there is consistency in the data analysis.

It is our intention to collaborate and work closely with the City Management Team to ensure that we are all in agreement on the approaches being applied for the various phases of the project. In particular, as the tree inventory portion of this project is new, we will want to meet with the City management team to ensure that the data collected will be useful to meet their intended outcomes.

Timing: Meeting for this phase of the project will begin immediately upon execution of the contract and will continue throughout the duration of the project.

Task 2.0 Analysis of Tree Canopy using Remote Sensing Techniques

As stated previously, our team will have access to the protocols that were previously developed and will repeat such methods using updated imagery for 2023. The protocol col is described below.

To characterize citywide canopy in the City of Gainesville, a dot-based sampling approach is used with NAIP aerial photographic imagery from 2006 and 2015 to quantify citywide tree canopy cover and change (Figure 1). 1500 dots were systematic randomly collected in ArcGIS 10.3, among which 500 dots were applied to test the verification error. Meanwhile, standard deviation error (SDE) is also calculated to show the confidence level of canopy interpretation using NAIP image. Only dots within the canopy were classified as canopy and marked as “Y”. A point located on non-vegetation or on the edge of the canopy or in shade was classified as non-canopy (N). In 2006, 748 out of 1500 were visualized as canopy, while 808 out of 1500 were canopy in 2015 (Table 1). The SDE is 1.3% for both 2006 and 2015.

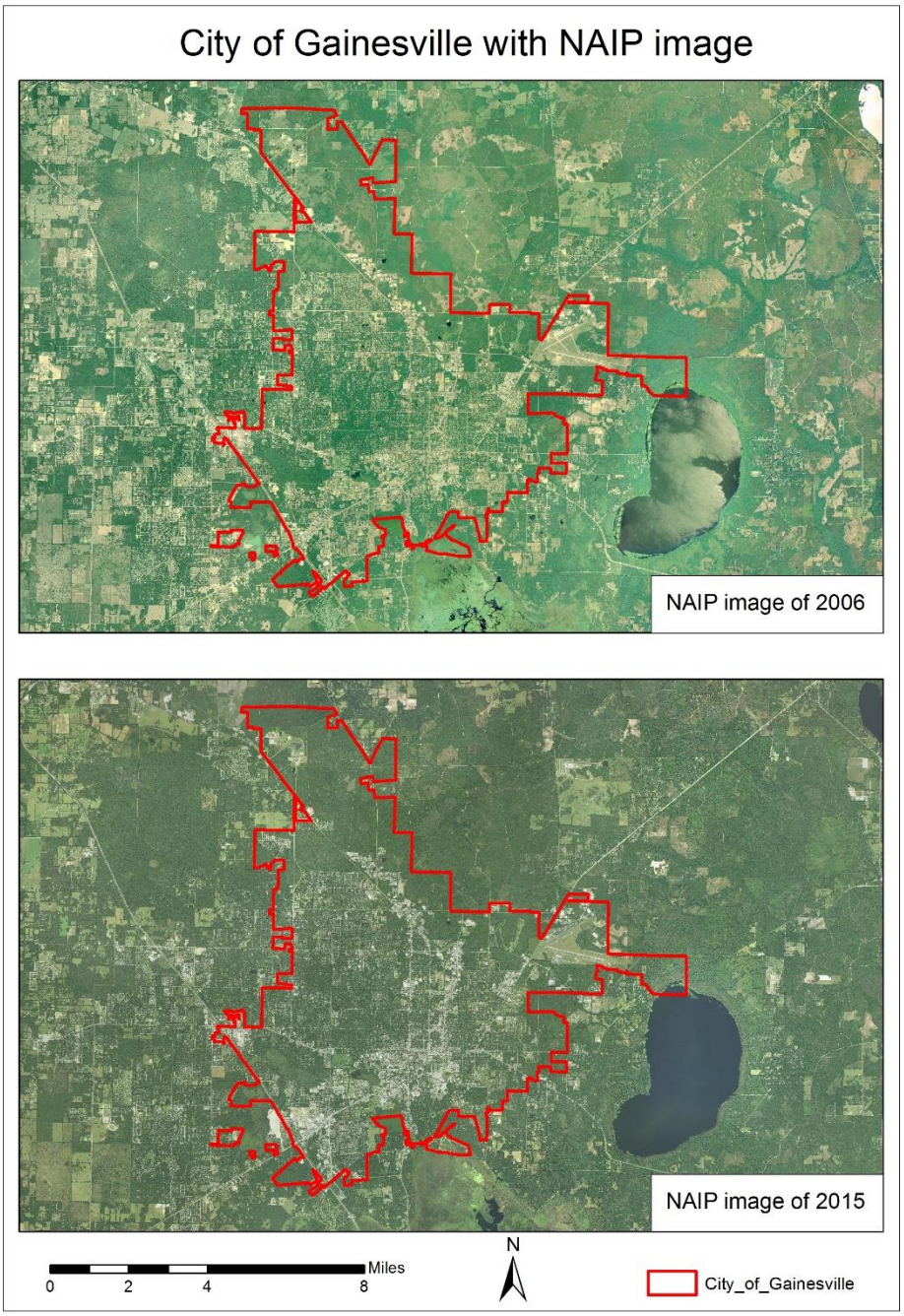


Table 1 Count of canopy and non_canopy of both 2006 and 2015.

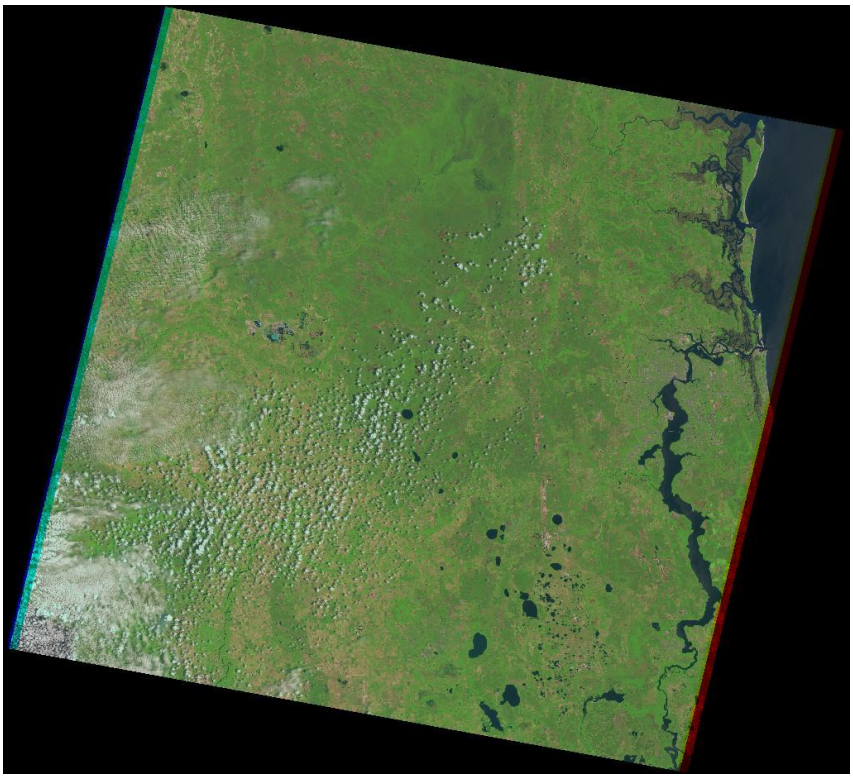
	2006	2015
Canopy	748 (49.9%)	808 (53.9%)
Non-canopy	752 (50.1%)	692 (46.1%)
Total	1500	1500

We also propose to repeat the forest canopy cover change analysis using Landsat data. We have the imagery from 1996, 2006, 2015 and will acquire it for 2023. The protocols described below were used in the previous project and will be used again for this project to ensure consistency.

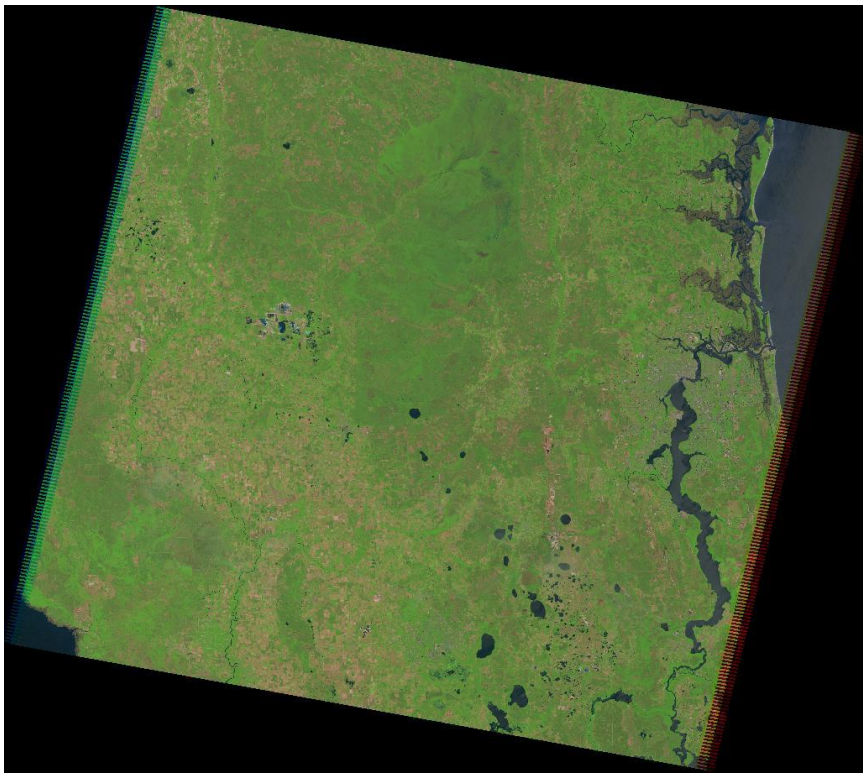
1. **Landsat Data download**

The data acquired in summer of 1995 and 2005 were covered by clouds over the study area as shown in appendix Figure 1 and 2. So we chose data acquired from United States Geological Survey (USGS) (http://earthexplorer.usgs.gov/) on 5/6/1996, 5/2/2006 and 5/11/2015 as shown in Table 2 and Figure 2.

5/6/1996



5/2/2006



5/11/2015

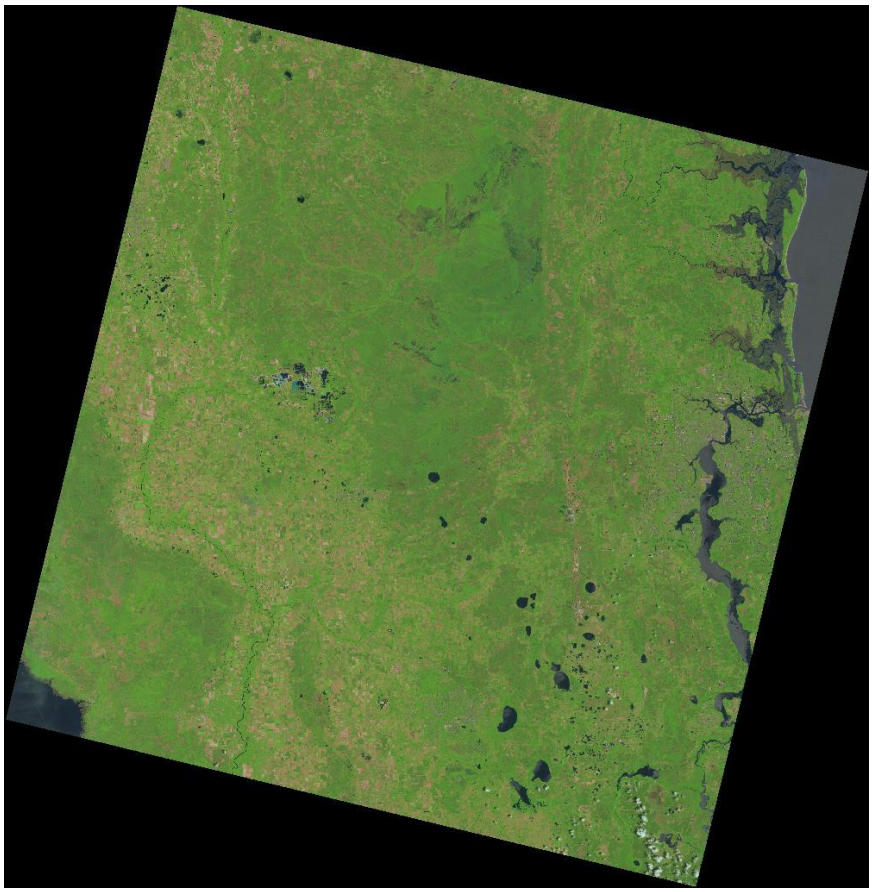


Figure 1 natural color preview image of Landsat TM data used.

Table 2 Landsat data acquired in 1996, 2006 and 2015.

	Path, Row	Acquired Time	Quality	Sensor
Image 1	17, 39	5/6/1996	Good	Landsat 5
Image 2	17, 39	5/2/2006	Good	Landsat 5
Image 3	17, 39	5/11/2015	Good	Landsat 8

2. Landsat image processing

2.1. Calibration

Calibration is to calibrate original DN to radiance, reflectance or brightness temperature. Top of atmospheric reflectance and surface reflectance were achieved using ENVI 5.2 classic and ENVI 4.8.

2.1.1. ToA (top of atmosphere) Reflectance

ENVI 5.2 classic > Basic Tools > Preprocessing > Calibration Utilities > Landsat Calibration, select Reflectance.

2.1.2. Surface Reflectance

Firstly, to run FLAASH the radiance data is needed. ENVI 5.2 classic > Basic Tools > Preprocessing > Calibration Utilities > Landsat Calibration, select Radiance.

Since the FLAASH model in ENVI 5.2 Classic doesn't work, so ENVI 4.8 was applied.

2.2. Normalization

The data of 2006 was employed as the standard image, based on which other two images (1996, 2015) were normalized. Linear model is generated for each band with corresponding band of 2006. The general model is as shown in in Equation 1:

$$y = x + b \quad (1)$$

where y is band reflectance of 2006, and x stands for corresponding band reflectance of 1996 or 2015. The linear models of normalization for each band based on the image of 2006 are as shown in Table 3. The R squares are higher than 75%, except band 2 of Landsat image of 2015 with R square 74.89%, pretty close to 75%. Therefore, all the regression models are acceptable.

Table 3 Linear models of normalization for each band, image of 2006 as standard image.

		2006_B1	**2006_B2**	**2006_B3**	**2006_B4**	**2006_B5**	**2006_B7**
1996	**a**	1.0539	1.1205	1.0471	0.97	0.9227	0.9328
	b	-80.955	-91.335	-63.242	-100.18	66.302	82.921
	R^2	0.966	0.9516	0.9294	0.9705	0.9776	0.9765
2015	**a**	0.6439	0.7459	0.7622	0.8081	0.8215	0.8808
	b	214.43	217.66	184.37	186.99	50.946	137.04

	R^2	0.7872	0.7489	0.822	0.9325	0.9746	0.8808

3. Decision tree

To achieve the amount and distribution of canopy and non-canopy from Landsat image, decision tree with biophysical composition index (BCI) and normalized difference vegetation index (NDVI) was applied to classify canopy and non-canopy from Landsat images. The decision tree classifier is generated using Landsat image of 2006 based on the verification data from NAIP image (Canopy and Non-canopy), then it is tested using image of 2015, lastly, it is applied to extract canopy from image of 1996. Decision tree classification is popular in remote seeing community to classify land cover types. It is defined as a classification procedure that recursively partitions a data set into smaller subdivisions on the basis of a set of tests defined at each branch in the tree (Friedl and Brodley 1997). BCI is a quantitative spectral indicator designed for characterizing major urban land cover compositions following Ridd's conceptual vegetation–impervious surface–soil (V–I–S) triangle model. It could be derived with the help of the normalized Tasseled Cap (TC) spectral, as shown in Eqs 2-5. TC transformation for Landsat data, which could transform spectral reflectance to brightness, greenness and wetness (the first three components), is able to highlight relevant vegetation variance (Healey, Cohen et al. 2005). The combination of BCI and NDVI is able to reduce within-class variation and enhance between-class variation among various urban compositions. This method was successfully used to extract endmembers of urban land cover types in urban areas of Franklin County, Ohio (Deng and Wu 2013).

$$BCI = \frac{(H + L)/2 - V}{(H + L)/2 + V} \quad (2)$$

$$H = \frac{TC1 - TC1_{min}}{TC1_{max} - TC1_{min}} \quad (3)$$

$$V = \frac{TC2 - TC2_{min}}{TC2_{max} - TC2_{min}} \quad (4)$$

$$L = \frac{TC3 - TC3_{min}}{TC3_{max} - 3} \quad (5)$$

where H, V, and L are the normalized TC components 1, 2 and 3, indicating “high albedo material”, “vegetation”, and “low albedo material”, respectively; TCi (i = 1, 2, 3) are the first three original TC spectra; TCimax and TCimin are the maximum and minimum values of the ith TC component, respectively.

The extraction rule for canopy and non-canopy from decision tree applied for 2006 and 2015 is achieved using decision tree classification in Rstudio programming software. According to the decision rule (Figure 3), pixels with NDVI equal and larger than 0.7286 or pixels with NDVI larger than 0.6617 and BCI larger than -0.2913 were considered as canopy, otherwise as non-canopy. We also compared the classification result with verification from NAIP images, as shown in Table 4-5. Most of the true canopy pixels are successfully classified as canopy. The total canopy pixels are underestimated for both 2006 and 2015 (respectively, 45.87% and 45.13%), compares to the amount of canopy extracted from NAIP image (49.9% and 53.9%).

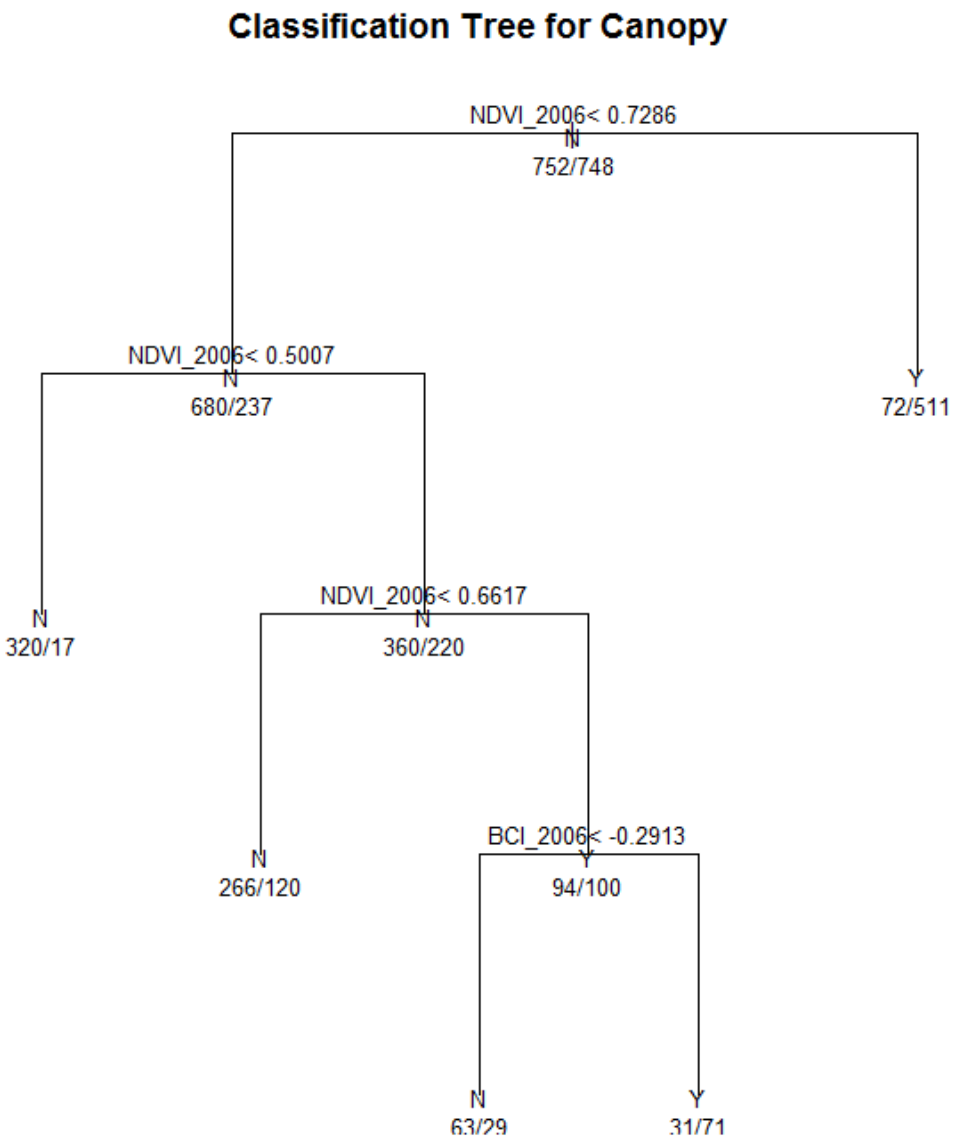


Figure 2 Decision tree rule for 2006

Table 4 Classification confusion matrix on pixel.

n=1500		True 2006			True 2015		
Class		Canopy	Non-canopy	Total	Canopy	Non-canopy	Total
Predicted	Canopy	583	105	688	565	112	677
	Non-canopy	165	647	812	243	580	823
	Total	748	752	1500	808	692	1500

Table 5 Classification confusion matrix on percent.

n=1500		True 2006 (Percent)			True 2015 (Percent)		
Class		Canopy	Canopy	Total	Canopy	Non-canopy	Total
Predicted (Percent)	Canopy	77.94	14.04	45.87	75.53	14.97	45.13
	Non-canopy	22.06	86.04	54.13	30.07	83.82	54.87
	Total	100	100	100	100	100	100

The decision tree classifier was applied to whole study area (City of Gainesville) for 1996, 2006 and 2015. The distribution of canopy and non-canopy in 1996, 2006 and 2015 is shown in Figure 4-6. The amount of canopy from 1996 to 2006 was decreased and then increased a small portion from 2006 to 2015 (Table 6).

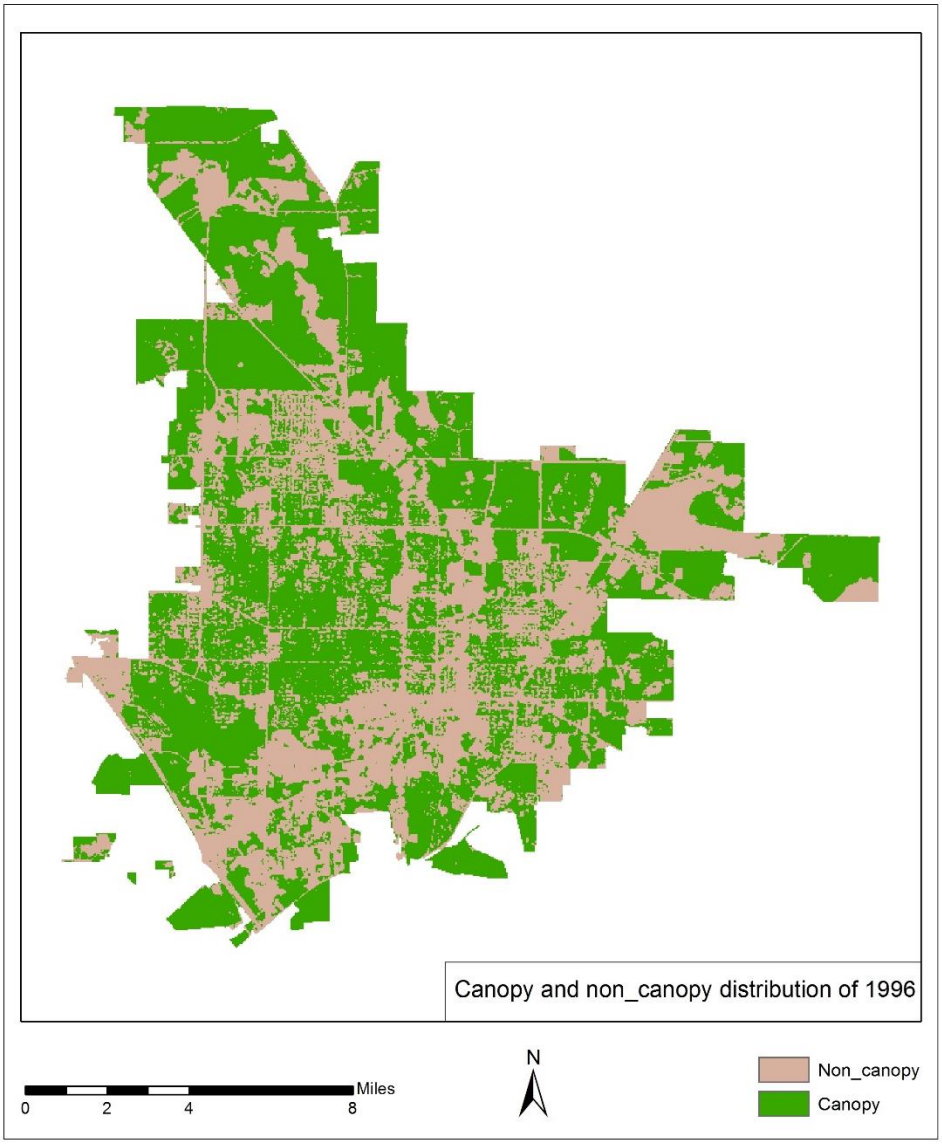


Figure 3 Canopy and non-canopy distribution of 1996 in the City of Gainesville.

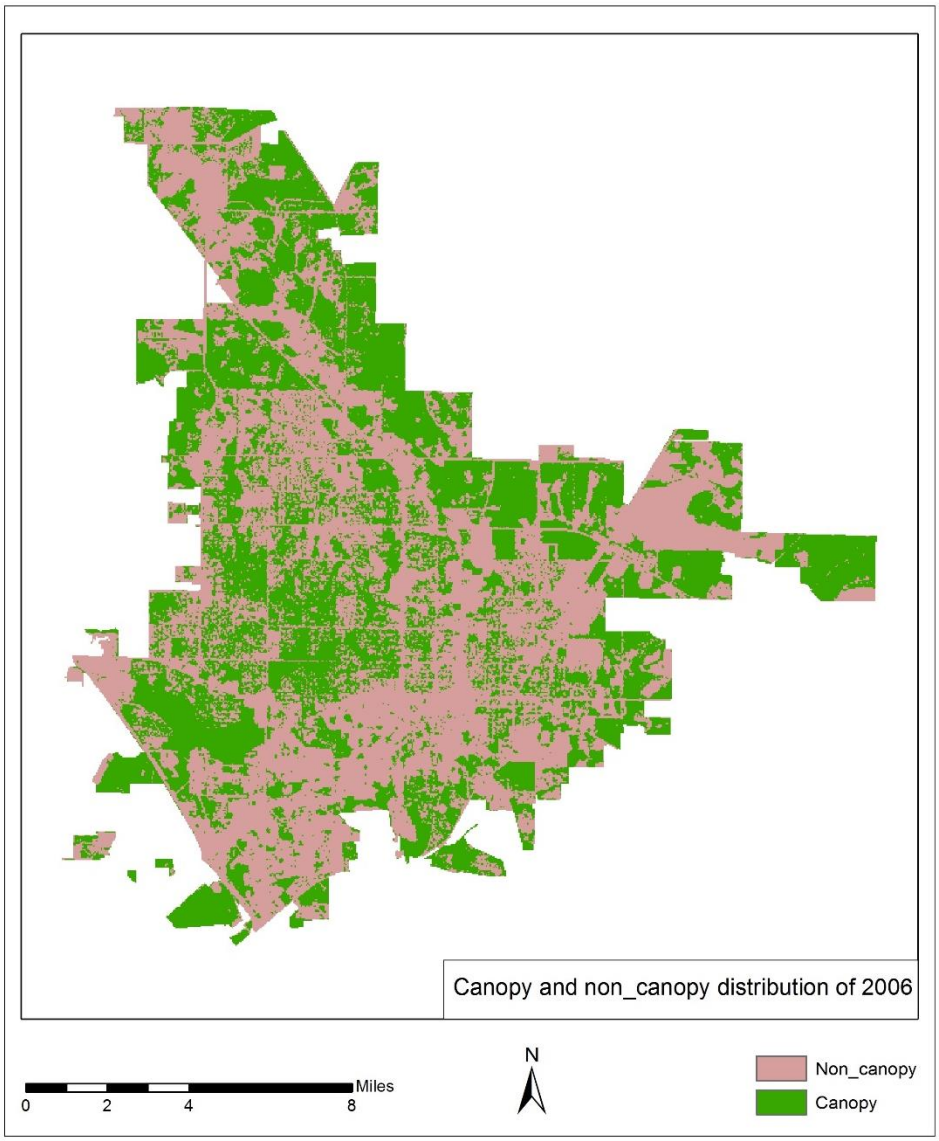


Figure 4 Canopy and non-canopy distribution of 2006 in the City of Gainesville.

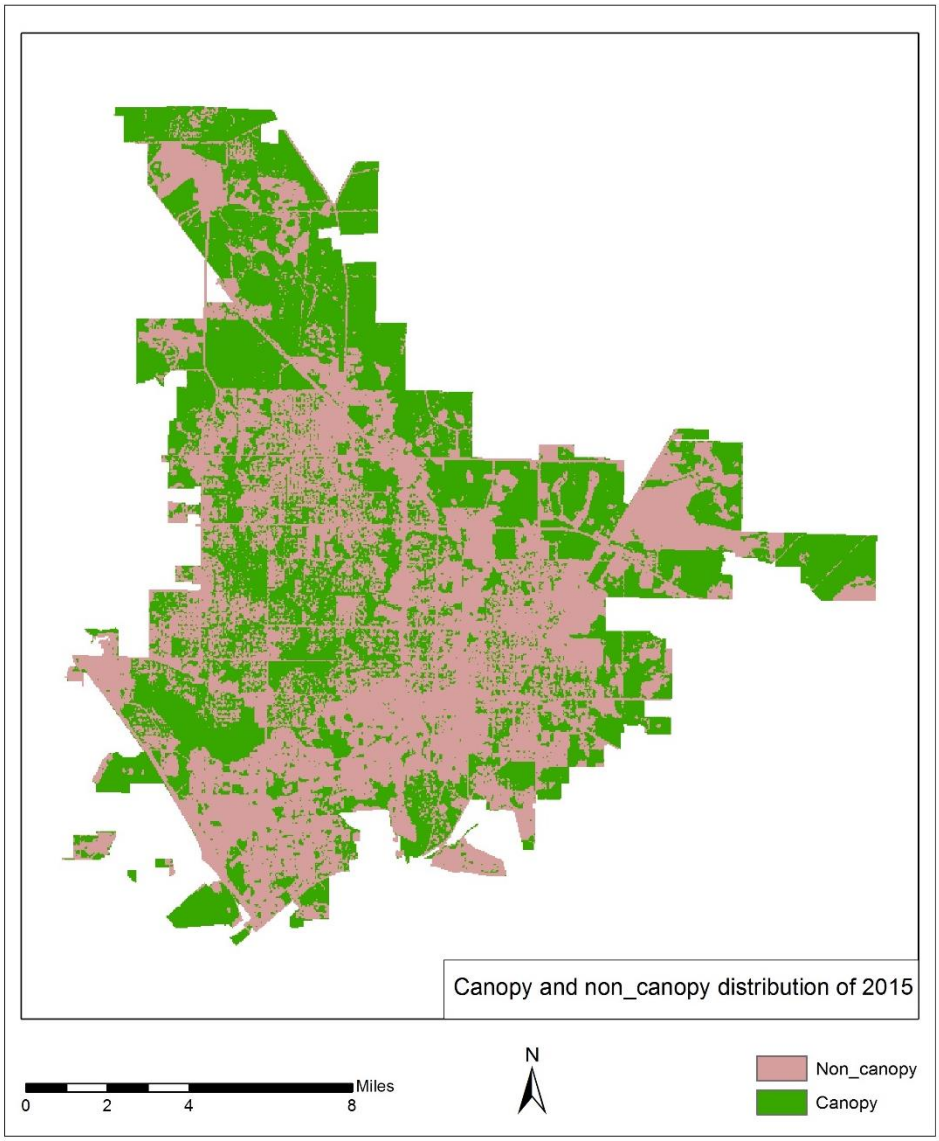


Figure 5 Canopy and non-canopy distribution of 2015 in the City of Gainesville.

Table 6 Classification result from Landsat images for the City of Gainesville using decision tree on percent.

	Landsat 1996	Landsat 2006	Landsat 2015
Canopy (%)	57.96	46.34	47.52
Non-canopy (%)	42.04	53.66	52.48

The distribution of canopy change from 1996 to 2015 and from 2006 to 2015 is shown in Figure 7 and 8. Generally, the canopy in the City of Gainesville is decreasing and the decreasing rate is getting slower from 1996 to 2015 as shown in Table 7. From 1996 to 2015, in total, 17.73 km2 of canopy is lost, specifically 7.89 km2 of canopy is gained, while 25.62 km2 of canopy is lost. From 2006 to 2015, in total, 1.81 km2 of canopy is lost, specifically 13.51 km2 of canopy is gained, while 15.32 km2 of canopy is lost.

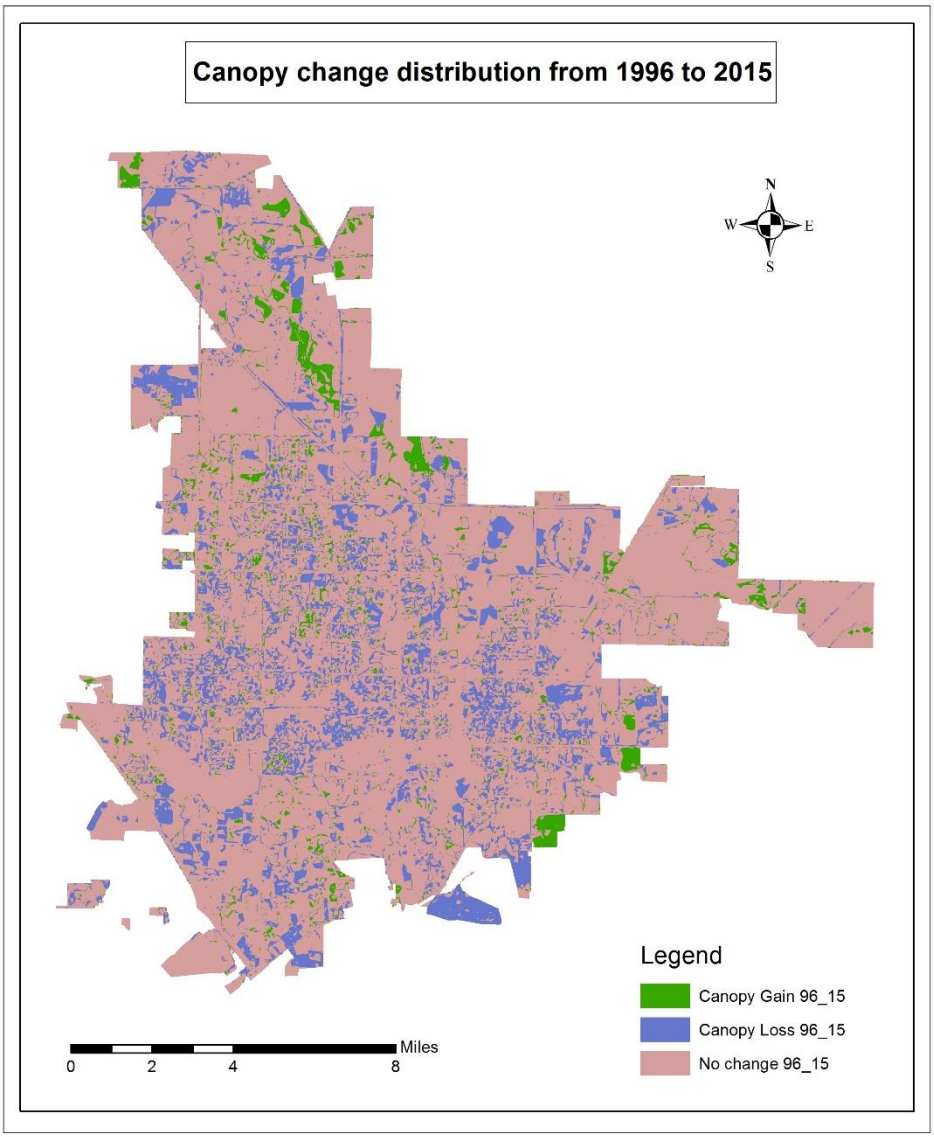


Figure 6 Canopy change distribution from 1996 to 2015 in the City of Gainesville.

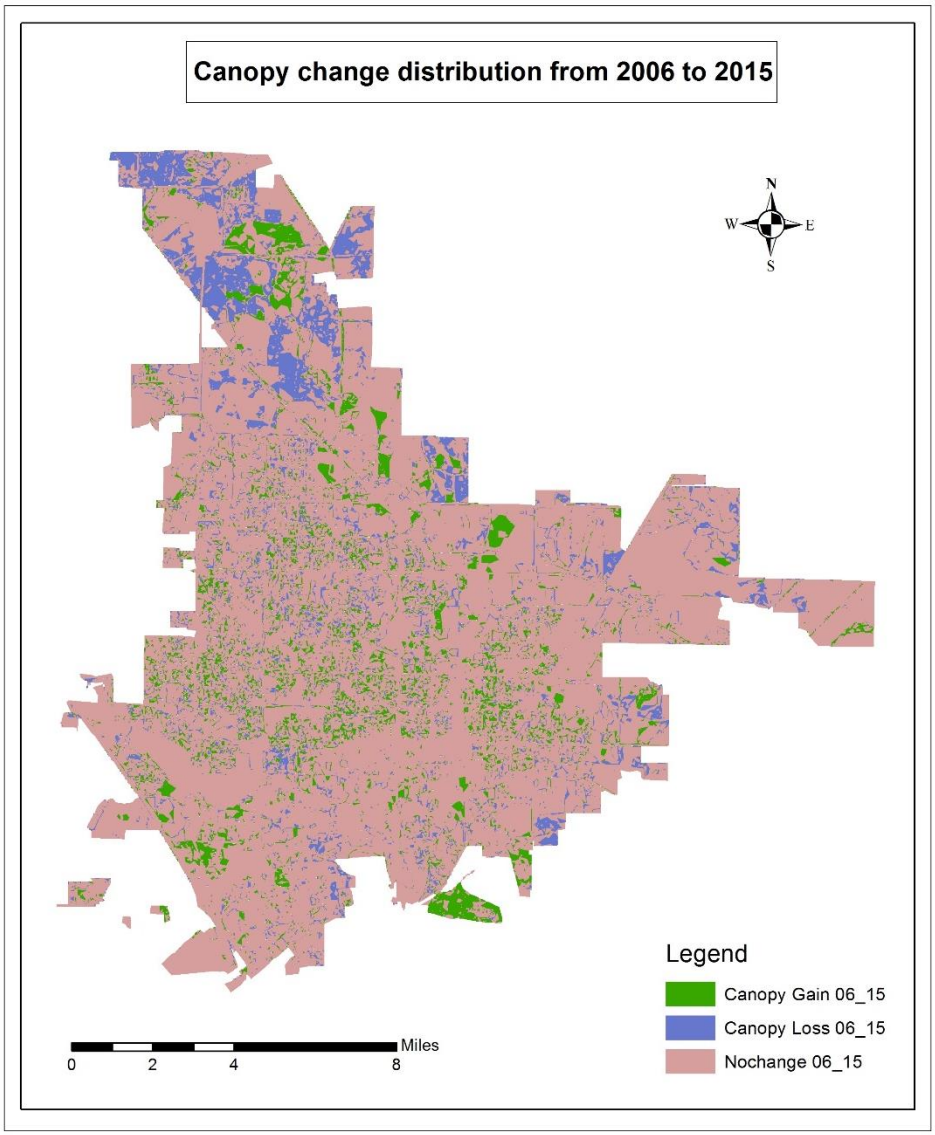


Figure 7 Canopy change distribution from 2006 to 2015 in the City of Gainesville.

Table 7 Canopy change in the City of Gainesville.

	Canopy gain (km2)	Canopy loss (km2)	No change (km2)
From 1996 to 2015	7.89 (4.80%)	25.62 (15.57%)	131.03 (79.63%)
From 2006 to 2015	13.51 (8.21%)	15.32 (9.31%)	135.74 (82.48%)

Timing: Work for this phase of the project will begin immediately upon execution of the contract and will be completed within the first year.

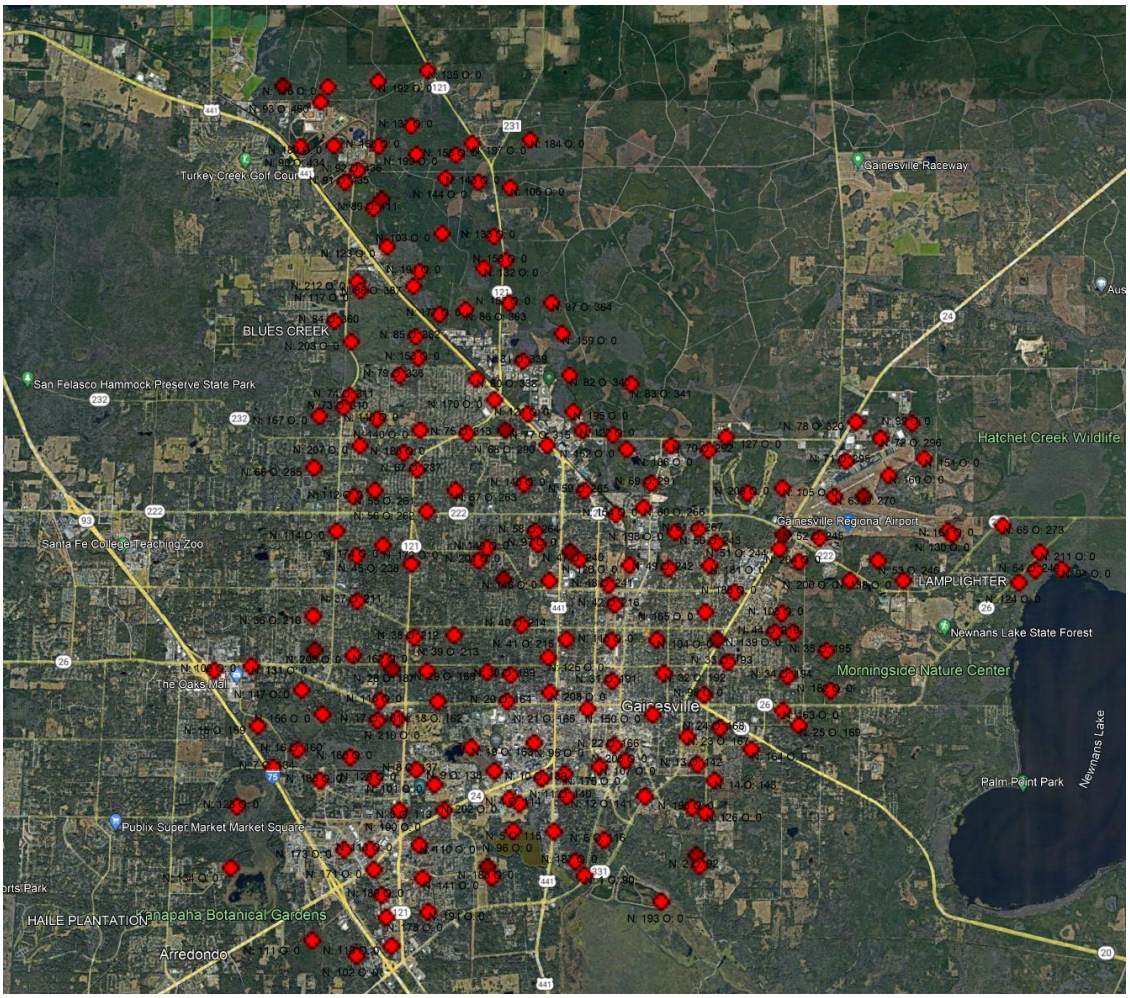
Task 3.0 Field Work and i-Tree Eco Analysis

The land use categories are defined for use as strata by the i-Tree Eco model based on land uses and zoning provided by the City in geographic information files (GIS). Classification of all parcels within the City was done according the following Eco land use definitions.

ECO Land Use	Description
Agriculture	Pastures, row crops, or wholesale nurseries
Commercial	Retail and professional business uses
Forested	Upland and wetland forests, both natural and planted
Industrial	Industrial uses including municipal water, waste, and power facilities
Open Space / Park	Park and recreational lands, cemeteries, golf courses
Public / Institutional	Government offices, hospitals, schools, churches, & other municipal facilities
Residential	All forms of housing
Transportation	Roads, railroads, and airports

Certain City land use codes directly translated to Eco land uses while others did not. Some individual parcels were manually classified using GIS layers and aerial photography to aid in the classification decision. Appendix A. of the 2016 report includes a crosswalk of CITY landuse Codes and i-Tree ECO Land Use Codes. To ensure consistency between the analysis time periods we propose to use the same approach as in the 2016 report.

We propose to continue to utilize the previously developed protocols for this project to ensure consistency between measurement periods.



It is our intention to return to exact plot locations to repeat measurements of the i-Tree Eco plots installed in 2015. In some cases permission is not granted to return to a plot for remeasurement. In those cases, the plot will be re-randomized and a new plot center will be located and monumented. As these plots do not have any permanent monumentation, our team will use the GPS locations of all previous plots as well as photos and field notes to facilitate the location of plot center.

We invite City Urban Forestry Staff and GRU Forestry staff to participate and monitor the sampling process and they accepted our invitations. We would encourage this sort of collaboration moving forward to ensure a sense of trust and confidence in the data collected. Our crew-chief will conduct periodic check cruises of the plots for Quality Assurance and all data will be available to City personnel if they wish to audit our data.

Timing: Work for this phase of the project will begin immediately upon execution of the contract (assuming trees are holding leaves) and will be completed within two complete growing seasons.

Task 4.0 Tree Inventory

A comprehensive tree inventory of all City-owned street trees, on rights-of-ways (ROW's), and in urbanized sections of City parks will be conducted by our team. This will not include trees owned by the City in forested and conservation lands. Trees within 100' of urbanized sections of a City park (i.e., presence of buildings, parking lots, domestic grass turf, or manmade ground cover) will be inventoried.

Data will be collected on each tree ≥8" in diameter and will be recorded on "TreePlotter" software. The following data will be collected for each tree:

1. Species name
2. GPS coordinates: Latitude-Longitude
3. Diameter at Breast Height (DBH)
4. Estimated Height (Range of Values)
5. Estimated Crown Spread (Range of Values)
6. Condition (Excellent, Good, Fair, Poor; including specific Condition of Concern)
7. Risk Rating (Level 1 Assessment)
8. Available Planting Locations should also be geo-located and tallied
9. Picture

Data collection labor: Tree inventory data will be collected by two teams of two. To collect the pre-determined variables, we estimate that this will take approximately 6.5 minutes per tree. The time allocated per tree consists of the following estimates for the average time needed to collect and enter data for each variable: species (30 seconds), latitude-longitude (30 seconds), DBH (30 seconds), tree height (30 seconds), crown spread (1 minute), condition rating/condition of concern (1 minute), risk rating (1 minute), identify available planting locations (30 seconds), take a picture (30 seconds), and walking from one tree to the next (30 seconds). Furthermore, we have estimated 30 minutes travel time per day, which accounts for traveling to the first site, throughout town, and from the last site at the end of each day. We have also built in additional time to account for unforeseen travel and weather delays as well as the time needed to fuel vehicles. Additionally, team members will be trained on field methods over the course of a week prior to commencing the inventory. Lastly, the proposed cost of the inventory also accounts for data curation back at the lab.

Similar to the ecological analysis, we will invite City Urban Forestry Staff and GRU Forestry staff to participate and monitor the inventory process. Likewise, our crew-chief will conduct periodic checks of trees for Quality Assurance and all data will be available to City personnel if they wish to audit our data.

Timing: Work for this phase of the project will begin immediately upon execution of the contract (assuming trees are holding leaves) and will be completed within two complete growing seasons.

Task 5.0 Final Report

The RFP included a copy of the final report we produced for the City in 2016 and we presume that this high-quality style of reporting is deemed desirable. The i-tree ECO portion of the report will include the following analysis at a minimum:

- Citywide tree canopy temporal change from 1995 – 2023
- Landsat-derived tree cover maps and summarized data by neighborhood and land use/cover
- Tree species diversity summarized by land use/cover

- Density of trees by land use/cover category
- Tree species/size distribution
- Tree, shrub and ground cover estimates by land use/cover category
- Leaf area by tree species and land use/cover category
- Relative health of trees by land use/cover category
- Residential energy savings and CO_2 emissions avoided
- Estimated air pollution removal by trees including carbon monoxide (CO), nitrogen dioxide (NO2), ground level ozone (O_3), particulate matter (PM10), and sulfur dioxide (SO_2)
- Carbon dioxide (CO_2) storage and annual sequestration amounts by tree species, size class and land use/cover category
- Estimated compensatory (i.e. replacement) value of the trees in Gainesville

In addition, our report will include summarized information from TASK 4.0. This will include information about:

- Species composition
- Size distributions
- Tree Health
- Potential available planting spaces

This information will be presented in a variety of formats including tables, graphs but also spatially (maps).

All data collected for both the i-Tree Eco analysis and tree inventory will be available electronically and GIS compatible data files will be provided to the CITY.

In addition to the technical report, as we did in 2016, we presented the results of our findings in several different public forums as agreed upon in collaboration with the City. If deemed appropriate by the City Urban Forest Management Team, we propose to present results to members of the City Commission, Staff from Public Works, Parks and Recreation, the Tree Advisory Board, and to the public at some public event such as an Arbor Day Celebration or the Gainesville Urban Forest Workshop.

Finally, a series of peer reviewed UF-IFAS Extension Factsheets (EDIS) will be published summarizing ecosystems services from Gainesville's Urban Forest and the economic values derived from these services.

Timing: Work for this phase of the project will begin as Tasks 2.0, 3.0, and 4.0 are completed. We will present a final report by the end of the three-year period of the project if not earlier.

Budget Justification

LABOR

Ecological Analysis and Remote Sensing

OPS Crew Chief: This individual will be responsible for managing field crews, inputting data, running models, report writing. They will be hired OPS to work for 1.5 year @ $30/hour for a total of $93,960 salary and $3,946 fringe @ 4.2%.

OPS Crew Member: A crew consists of 3 individuals. They will primarily be involved in field measurements. They will be hired OPS at $19/hour and will each work an estimated 90 days for a total of $13,680 salary and $575 fringe @ 4.2% per crew member.

Remote Sensing OPS: Individual will be hired OPS to complete remote sensing analysis @ $22.00 per hour for an estimated 500 hours for a total of $11,000 salary and $462 fringe @ 4.2%.

Tree Inventory

Crew Chief: This individual will be responsible for managing Tree Inventory Field Crews, inputting data, & report writing. They will be hired OPS to work for a total of 2,600 hours @ $30/hour for a total of $78,000 salary and $3,726 fringe @4.2%.

OPS Field Crew (Employee): Tree inventory Crew will primarily be involved with field work. A total of 3 crew members will be hired OPS @ $19/hour and will each work an estimated 2,224hours for a total of $42,256 and $1,775 Fringe @ 4.2% per crew member.

OTHER DIRECT COSTS

Ecological Analysis and Remote Sensing

Laptop Computer: Eco Analysis Crew Chief will require a laptop computer to manage data, run analysis, and report writing, $1,500.

Data recorders: 4 data recorders (tablets) will be needed for field data collection, $4,500.

Field Gear: Field gear to complete measurements include: blaze orange vests, clinometers, hypsometers, compass, loggers tapes, diameter tapes, increment bores, soil sampling augers, flagging, GPS, cameras. $5,000 to equip crews.

Mileage: Estimated travel @100 miles per field day for 90 crew days $4,005

Postage/Printing: Maps, correspondence with homeowners, extension materials to homeowners, Educational materials, reports. $1,000

Tree Inventory

Data recorders (tablets): Tablets will be need to record tree data, $2,000.

Cellular hotspot: Needed to allow direct data input into cloud database, $600.

Mileage: Crews will be driving University vehicle. Estimated mileage costs: $4,000.

Direct Costs: $388,107

IDC @ 10% TDC: $38,811

Total: $426,916

Biographical Sketch

Ryan Klein Ph.D., University of Florida

(a) Professional Preparation

Ph.D.	University of Florida	Environmental Horticulture	2020
M.S.	University of Florida	Environmental Horticulture	2016
B.A.	Western Illinois University	Anthropology and Urban Forestry	2014
B.A.	Columbia College Chicago	Business	2008

(b) Appointments

2020-Present	Assistant Professor of Arboriculture, University of Florida • research, teaching, and extension related to arboriculture and urban forestry
2018	Arboricultural Consultant, Unified Building Sciences • created tree inventories for approximately 30 mobile home parks across Florida
2017-2020	Research Assistant, University of Florida • worked on arboriculture and urban forestry projects
2016-2017	Branch Manager, SavATree • oversaw tree and plant health care company
2014-2016	Research Assistant, University of Florida • worked on arboriculture and urban forestry projects
2005-2014	Foreman, Wilson Landscaping & Nursery • propagated and installed landscape trees
2004-2005	Ground Crew, A-Plus Tree Service • residential and commercial tree care

(c) A list of Products or Publications most closely related to the proposed project

Koeser, A.K., **Klein, R.W.**, Hauer, R.J., Miesbauer, J.W., Freeman, Z., Harchick, C., and B. Kane. 2023. Defective or Just Different? Observed Storm Failure in Four Urban Tree Growth Patterns. Forests. 14(5), 988; https://doi.org/10.3390/f14050988

Klein, R.W., McLean, D.C., Koeser, A.K., Hauer, R.J., Miesbauer, and A.B. Salisbury. 2022. Visual Estimation Accuracy of Tree Part Diameter and Fall Distance. Journal of Forestry, 2022;, fvac012, https://doi.org/10.1093/jofore/fvac012

Klein, R.W., Koeser, A.K., Hauer, R.J., Miesbauer, J.W., Hansen, G., Warner, L., Dale, A., and J. Watt. 2021. Assessing the consequences of tree failure. Urban Forestry & Urban Greening, 65, 127307. DOI: 10.1016/j.ufug.2021.127307

Klein, R.W., Koeser, A.K., Kane, B., Landry, S.M., Shields, H., Lloyd, S., and G. Hansen. 2020. Evaluating the Likelihood of Tree Failure in Naples, Florida (United States) Following Hurricane Irma. Forests. 11(5):485.

Klein, R.W., Koeser, A.K., Hauer, R.J., Hansen, G., and F. Escobedo. 2019. Risk Assessment and Risk Perception of Trees: A Review of Literature Relating to Arboriculture and Urban Forestry. Arboriculture & Urban Forestry. 45(1):23–33.

(d) Synergistic Activities /Contributions to Science

2022-Present	Florida Chapter of the International Society of Arboriculture Board of Directors
2022-Present	UF Urban Forestry Extension Council (Member)
2020-Present	Florida Chapter of the International Society of Arboriculture Educational Board
2019-Present	International Society of Arboriculture (ISA) Tree Risk Assessment Qualification (TRAQ)
2015-Present	International Society of Arboriculture (ISA) Certified Arborist

(e) Research Support/Extramural Funding received in the past 5 years

2023 Evaluating the Impacts of Climate Change on Urban Tree Performance and Survival. Center for Landscape Use Efficiency (CLUE) Graduate Student Support $25,000.00

2022 Post-fire Tree Risk Assessment Protocol for Western Urban Forests. USDA Forest Service. $65,000.00

2022 Urban Forestry Stewardship: Teaching Volunteers How to Structurally Prune Young Trees. Center for Landscape Use Efficiency (CLUE) Graduate Student Support $21,333.33

2022 Updating the "Florida Tree Selector Website" and Associated IFAS Southern Trees Fact Sheets (EDIS). Florida Chapter of the International Society of Arboriculture (ISA) Research Grant. $60,000.00

2021 Urban Forestry Stewardship: Teaching Volunteers How to Structurally Prune Young Trees. Center for Landscape Use Efficiency (CLUE) Graduate Student Support $21,333.33

Statement of Qualifications

Dr. Klein has been an International Society of Arboriculture (ISA) Certified Arborist (CA) since 2015 as well as has had his ISA Tree Risk Assessment Qualification (TRAQ) credential since 2019. Additionally, he has experience conducting tree inventories, having previously collected data at approximately 30 mobile home parks in Florida following Hurricane Irma. To date, he has conducted approximately 20 research projects on the topic of tree risk assessment, of which 13 have been published in peer reviewed scientific journal articles. Furthermore, Dr. Klein is the Instructor of the Arboriculture course at the University of Florida. His combined field experience, industry credentials, and understanding of the discipline make him a suitable candidate to oversee the tree inventory component of the project. Dr. Klein has a total of 19 years' experience in the fields of urban forestry and arboriculture. Included in the submission documents, you will find copies of the abovementioned certifications.

Price Proposal

3.1 PROJECT COSTS AND DELIVERABLES
Total cost is based on completion of all project tasks and deliverables stated above (TASKS 1- 5). Budget will cover: labor, field equipment (including computer tablets for data collection), computer for data input and analysis, vehicle mileage, printing and postage, purchase of imagery.

1. TOTAL COST FOR ECOLOGICAL ANALYSIS-: $ 184,952

2. COST FOR TASK 4 TREE INVENTORY - $ 241,964 or approximately $ 6.28 per tree cost

(Total cost will be based on an estimated 38,500 number of trees-25,000 total street trees and 13,500 total urban park trees)

Award will be based on total cost of 1 and 2.

DRUG-FREE WORKPLACE FORM

The undersigned bidder in accordance with Florida Statute 287.087 hereby certifies that

University of Florida Board of Trustees does:

(Name of Bidder)

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for the drug abuse violations.

3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).

4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of Chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.

5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.

6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this bidder complies fully with the above requirements.

Ronald C Foster

Bidder's Signature

6/26/2023

Date

In the event of a tie bid, bidders with a Drug Free Workplace Program will be given preference. To be considered for the preference, this document must be completed and uploaded to DemandStar.com with your Submittal.

BIDDER VERIFICATION FORM

LOCAL PREFERENCE (Check one)
Local Preference requested: ☐ YES ☑ NO

A copy of your ***Business Tax Receipt*** must be included in your submission if you are requesting Local Preference:

QUALIFIED SMALL BUSINESS AND/OR SERVICE DISABLED VETERAN BUSINESS STATUS (Check one)
Is your business qualified, in accordance with the City of Gainesville's Small Business Procurement Program, as a local Small Business? ☐ YES ☑ NO

Is your business qualified, in accordance with the City of Gainesville's Small Business Procurement Program, as a local Service-Disabled Veteran Business? ☐ YES ☑ NO

R GISTERED TO DO BUSINESS IN THE STATE OF FLORIDA
Is Bidder registered with Florida Department of State's, Division of Corporations, to do business in the State of Florida?
☐ YES ☒ NO (refer to Part 1, 1.6, last paragraph)

If the answer is "YES", provide a copy of SunBiz registration or SunBiz Document Number (#_____)

If the answer is "NO", please state reason why: Public Institution of Higher Education

University of Florida Board of Trustees
Bidder's Name

Nick Pugh, Sponsored Programs Officer
Printed Name/Title of Authorized Representative

Signature of Authorized Representative \ 6/26/2023 Date

This page must be completed and uploaded to DemandStar.com with your Submittal.

REFERENCE FORM

Name of Bidder: _____University of Florida_____

Provide information for three references of similar scope performed within the past 3 years. You may include photos or other pertinent information.

#1 Year services provided (2022-2023)
Company Name: International Society of Arboriculture (ISA)
Address: 270 Peachtree St NW, Suite 1900
City, State Zip: Atlanta, GA 30303
Contact Name: Tom Smiley (Project lead/co-author on the ISA Tree Risk Assessment BMP's)
Phone: (704) 236-8422
tsmiley@bartlett.com

#2 Year(s) services provided (2022)

Company Name: City of Sheboygan
Address: 2026 New Jersey Avenue
City, State Zip: Sheboygan, WI 53081
Contact Name: Timothy Bull
Phone: (920) 459-3395
timothy.bull@sheboyganwi.gov

#3 Year services provided (2018)
Company Name: Unified Building Sciences
Address: 1024 Pine Grove Drive
City, State Zip: Alpharetta, GA 30009
Contact Name: Josh Paxton
Phone: (310) 877-7885
joshuap@unifiedgroup.com

10. UF W-9

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

▶ Go to *www.irs.gov/FormW9* for instructions and the latest information.

Give Form to the requester. Do not send to the IRS.

Print or type. See Specific Instructions on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

University of Florida Board of Trustees

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☑ Other (see instructions) ▶ State of Florida Governmental Unit (Instrumentality)

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) 3

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

1523 Union Rd Rm 207

Requester's name and address (optional)

6 City, state, and ZIP code

Gainesville, FL 32611-1941

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN,* later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

			–			–				

or

Employer identification number

5	9	–	6	0	0	2	0	5	2

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here Signature of U.S. person ▶ Olga Weider Date ▶ 2/22/23

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9.*

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, *later.*

The International Society of Arboriculture

Hereby Announces That

Ryan W. Klein

Has Earned the Credential

ISA Tree □is□Assessment □ualification®

By successfully meeting ISA Tree □is□Assessment □ualification certification requirements through demonstrated attainment of relevant competencies as supported by the ISA Credentialing Council

Caitlyn Pollihan
CEO & Executive Director

13 September 201□	13 September 2024
Issue Date	Expiration Date

June 5, 2023
City of Gainesville

RE: #PWDA-230046-DH

Dear Sir or Madam:

Please consider this letter the University of Florida's formal comment to the provided draft agreement.

UF has the following exclusion requests to the version of City of Gainesville Sample Contract provided to UF within the RFP titled Ecological Analysis and Tree Inventory (#PWDA-230046-DH).

Article 4	UF requests Article 4 be replaced with the following: City and Contractor understand that time is an important component of this Contract and that Contractor shall carry out the work in an expeditious manner. Contractor shall complete the work on or before [date].
Article 6	UF requests Article 6 be replaced with the following: Each of the Parties, as state agencies, agrees to be fully responsible for acts of negligence by its officers, employees or agents, when acting within the scope of their employment or agency, and agree to be liable for any damages resulting from said negligence, as provided in Section 768.28, Florida Statutes. Nothing herein is intended to serve as a waiver of sovereign immunity by any party to whom sovereign immunity may be applicable. Nothing herein shall be construed as consent by a state agency or subdivision of the State of Florida to be sued by third parties.
Article 8	UF requests Article 8 be deleted in its entirety and replaced with the following language: The Contractor is a public entity of the state Florida and has chosen to self-insure in accordance with its state's laws and regulations with limits specified thereby. Contractor will provide evidence of its self-insured status upon request.

Article 9	UF requests Article 9 be deleted in its entirety and replaced with the following language: Nothing in the Contract Documents shall be interpreted as a waiver of the either Party's sovereign immunity as granted under Section 768.28, Florida Statutes.
Article 11 B.	UF requests Article 11 (B) be replaced with the following language: This Contract may be terminated by either Party, without cause, upon thirty (30) days written notice to the other Party. In the event this Contract is so terminated, the Contractor shall be compensated for services and non-cancellable obligations rendered through the effective date of the termination.
Article 14 A	UF requests Article 14 (A) be replaced with the following: <u>Ownership and Publication of Materials.</u> All reports, information, data, and other materials prepared by the Contractor pursuant to the Contract Documents, except those separately identified in the Scope of Services or in other written agreements between the Parties, are owned by the Contractor. The Contractor has the exclusive and unrestricted authority to release, publish or otherwise use, in whole or in part, information contained therein and relating thereto. No material produced in whole or in part under the Contract Documents may be copyrighted or patented in the United States or in any other country without prior written approval of the Contractor. Contractor agrees that the City may use all reports, data and information prepared pursuant to the Contract Documents for any legal purpose.
14 B	UF requests Article 14 (A) be replaced with the following: Contractor represents that it owns or has rights to use all intellectual property used for the scope of each project, including patent rights, copyrights, or other intellectual property rights, except with respect to designs, processes or products of a particular manufacturer expressly required by the City for the performance of the work.
16	UF requests Article 16 be replaced with the following: RESERVED
23	Contractor Information is as follows: University of Florida Board of Trustees Division of Sponsored Programs 207 Grinter Hall P.O. Box 115500 Gainesville, FL 32611-5500 Phone: (352) 392-9267 Email: ufawards@ufl.edu

We appreciate the opportunity to provide you this preliminary review, but we do reserve the right to continue to negotiate any terms within the RFP or subsequent award agreement.

Please consider me your point of contact for negotiation and execution of the final agreement. Elizabeth Keeter, Assistant Director of Research, will provide the University of Florida authorized signature. You may send the final agreement to my attention at palchickd@ufl.edu. I look forward to working with you. Thank you for your attention.

Regards,

Daniel Palchick
Contracting Officer

The International Society of Arboriculture

Hereby Announces That

Ryan W. Klein

Has Earned the Credential

ISA Certified Arborist ®

By successfully meeting ISA Certified Arborist certification requirements through demonstrated attainment of relevant competencies as supported by the ISA Credentialing Council

Caitlyn Pollihan
CEO & Executive Director

17 July 2015	31 December 2024	FL-6756A
Issue Date	Expiration Date	Certification Number

ANAB
ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17024
PERSONNEL CERTIFICATION BODY
#0847
ISA Certified Arborist