Geographical Information Systems GIS

Tree Mapping at Collington

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Task Description

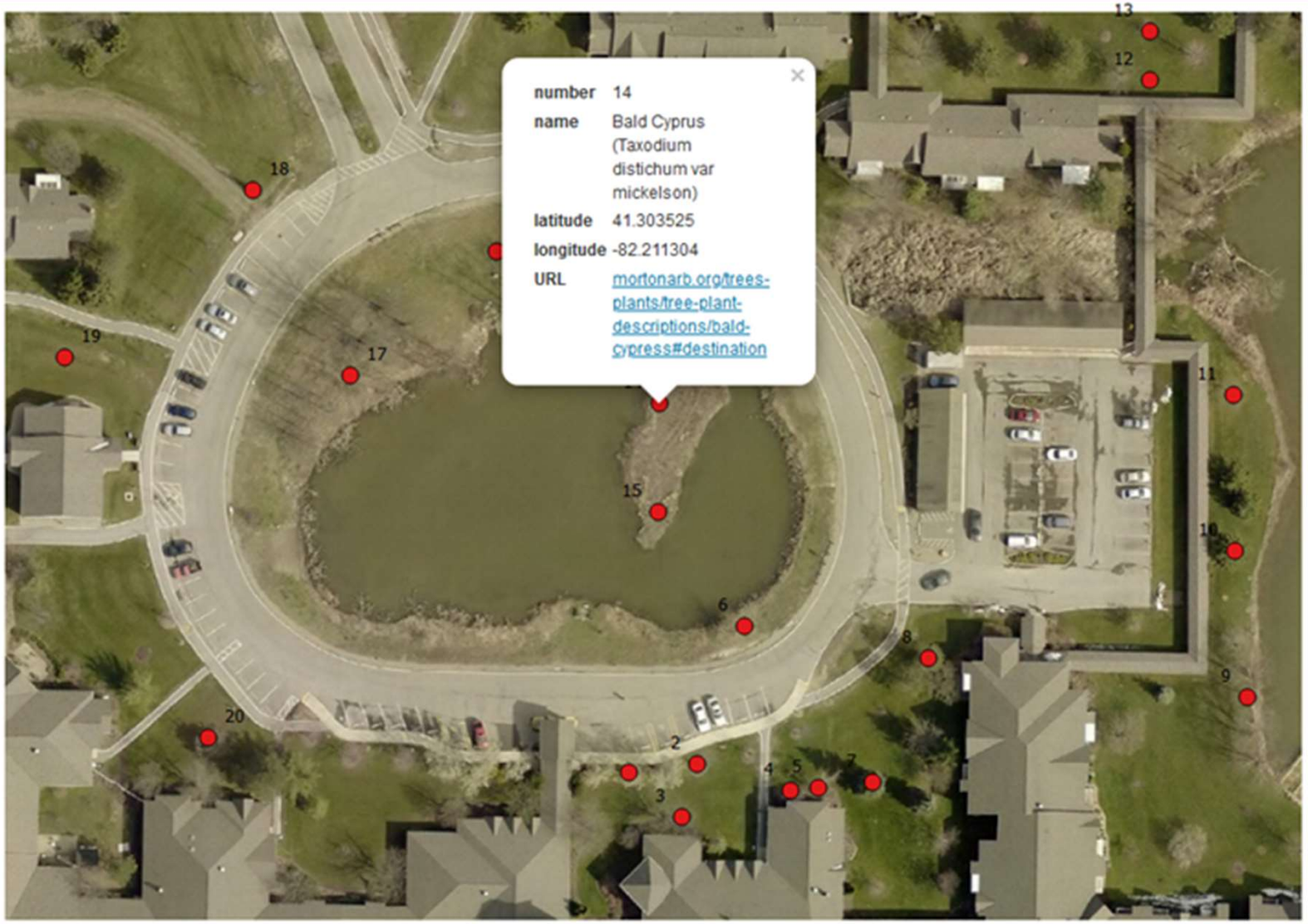
- **Can a Tree Mapping web page be developed for Collington like the one used by the Kendal at Oberlin website and arboretum website?**
- **The answer to this question led to a survey of Geographical Information Systems (GIS).**
- **Result:**
  - GIS systems can be developed.
  - Tech Committee goal is to develop a “free” system
  - There are technical conflicts trying to maintain a “free” system, but there are adequate “free” solutions

What is a GIS?
Geographical Information System

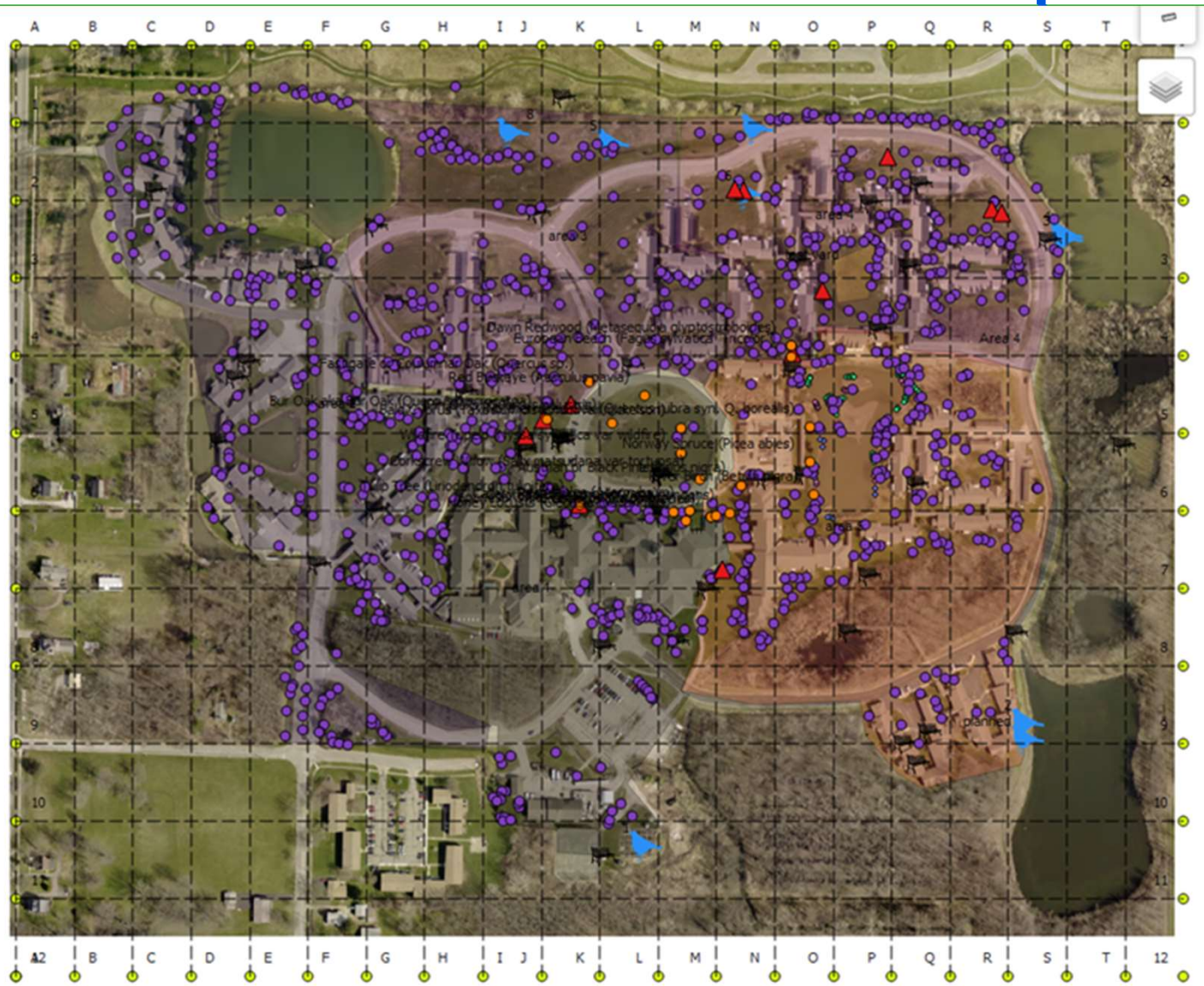
- **Geographic Information System (GIS)** is a conceptualized framework that provides the ability to capture and analyze spatial and geographic data.

- Historic descent from 2D drawings that are in sheets or layers.

Interactive Tree Maps of the Kendal at Oberlin Campus



Interactive Tree Maps of the Kendal at Oberlin Campus



GIS applications encountered

- **ArborScope** Evans Optical, Systems, Design, & Software Engineering
  - Commercial Tree Mapping System ($3K+$xK)
- **iTree Eco**
  - **"Free"** System via US Forest Service
- **PGAtlas**
  - PG County GIS ("**Free**", limited)
- **ArcGIS**
  - $100/year
- **QGIS**
  - **Free** GIS System
  - Similar to Libre Office + a CAD system (Complex)

iTree Eco

i-Tree Design v7.0

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Start Over
Save Progress
About

Get started with these easy steps:

1. Draw Structures ?
2. Place Trees ?

While we work to improve this year, please break your projects up into groups of 25 trees at a time.

Describe your tree:

- Tree species: (South region)
  Tree, Unknown
- Tree diameter: 3 Inches
  or circumference: 9.4
- Tree condition: Excellent
- Tree exposure to sunlight: Full sun

To place a tree:

- Drag this icon to the location on the map where you would like to place your tree.
- Repeat to place additional trees.
- Hover over any tree you have placed on the map to display its benefits.

Model the tree(s) future crown growth over time:

Model Crown Growth

Lat: 38.92263
Lng: -76.82552

iTree Eco

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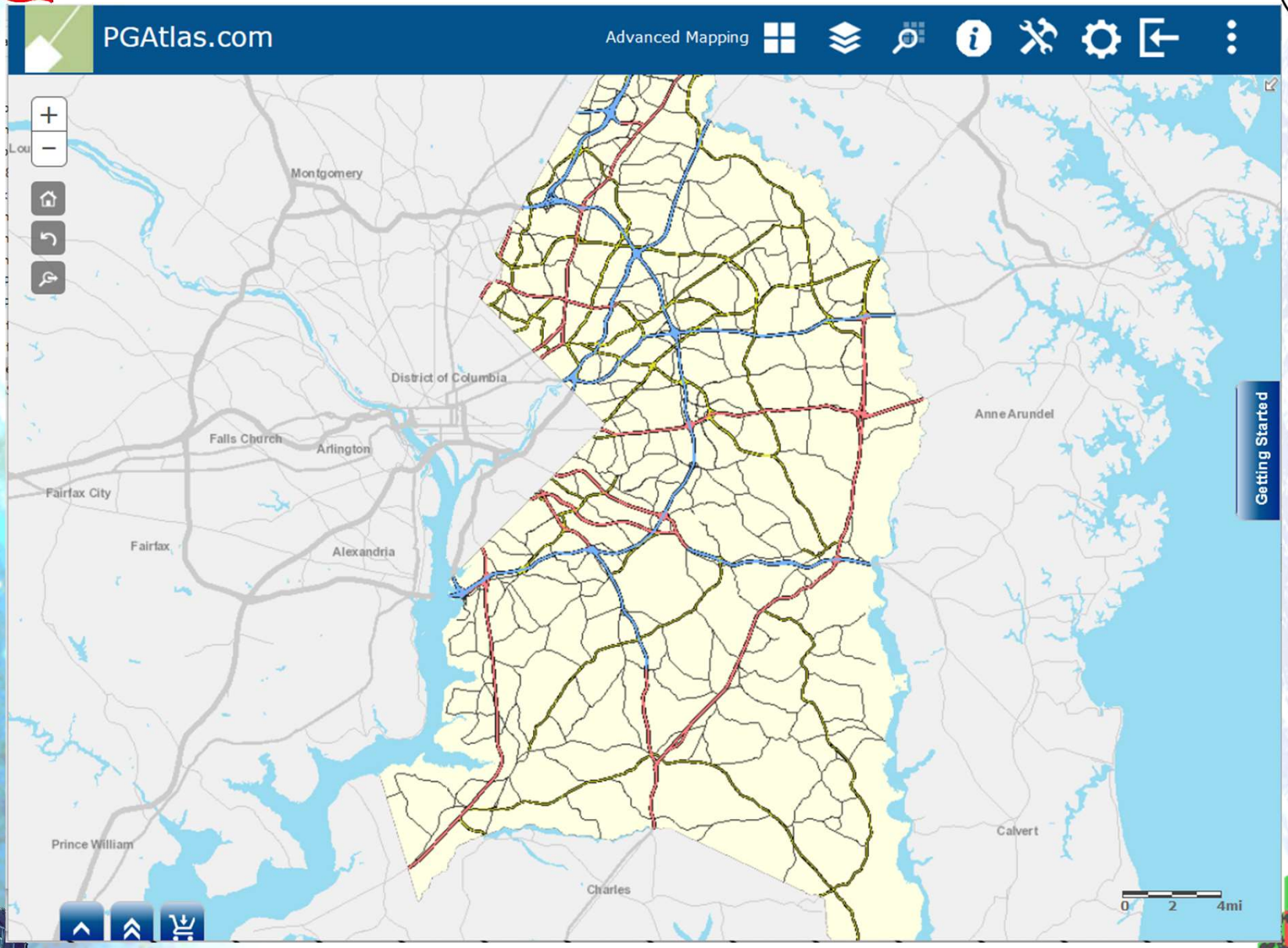
Save Progress
About

Lat: 38.92240
Lng: -76.82556

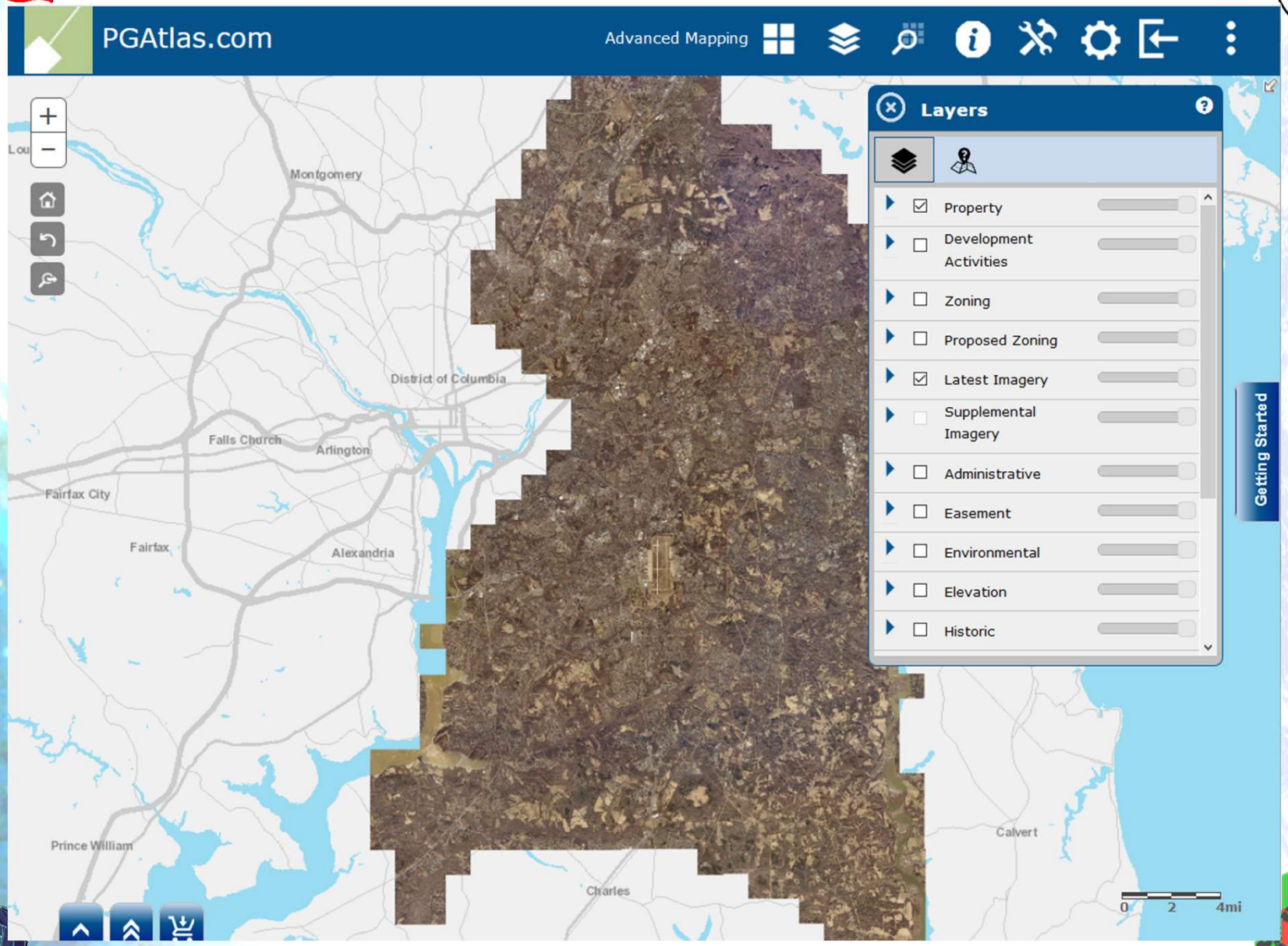
iTree Eco

- **Limited Data input**
- **Limited Screen viewing**
- **Data Resident in USFS Cloud**
  - binary on local computer
- **USFS requests access to tree data**

PGAtlas.com


PGAtlas.com
Advanced Mapping
Montgomery
District of Columbia
Falls Church
Arlington
Fairfax City
Fairfax
Alexandria
Anne Arundel
Prince William
Charles
Calvert
Getting Started
0
2
4mi

PGAtlas.com


PGAtlas.com
Advanced Mapping
Layers
Property
Development Activities
Zoning
Proposed Zoning
Latest Imagery
Supplemental Imagery
Administrative
Easement
Environmental
Elevation
Historic
Getting Started
Montgomery
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Arlington
Fairfax City
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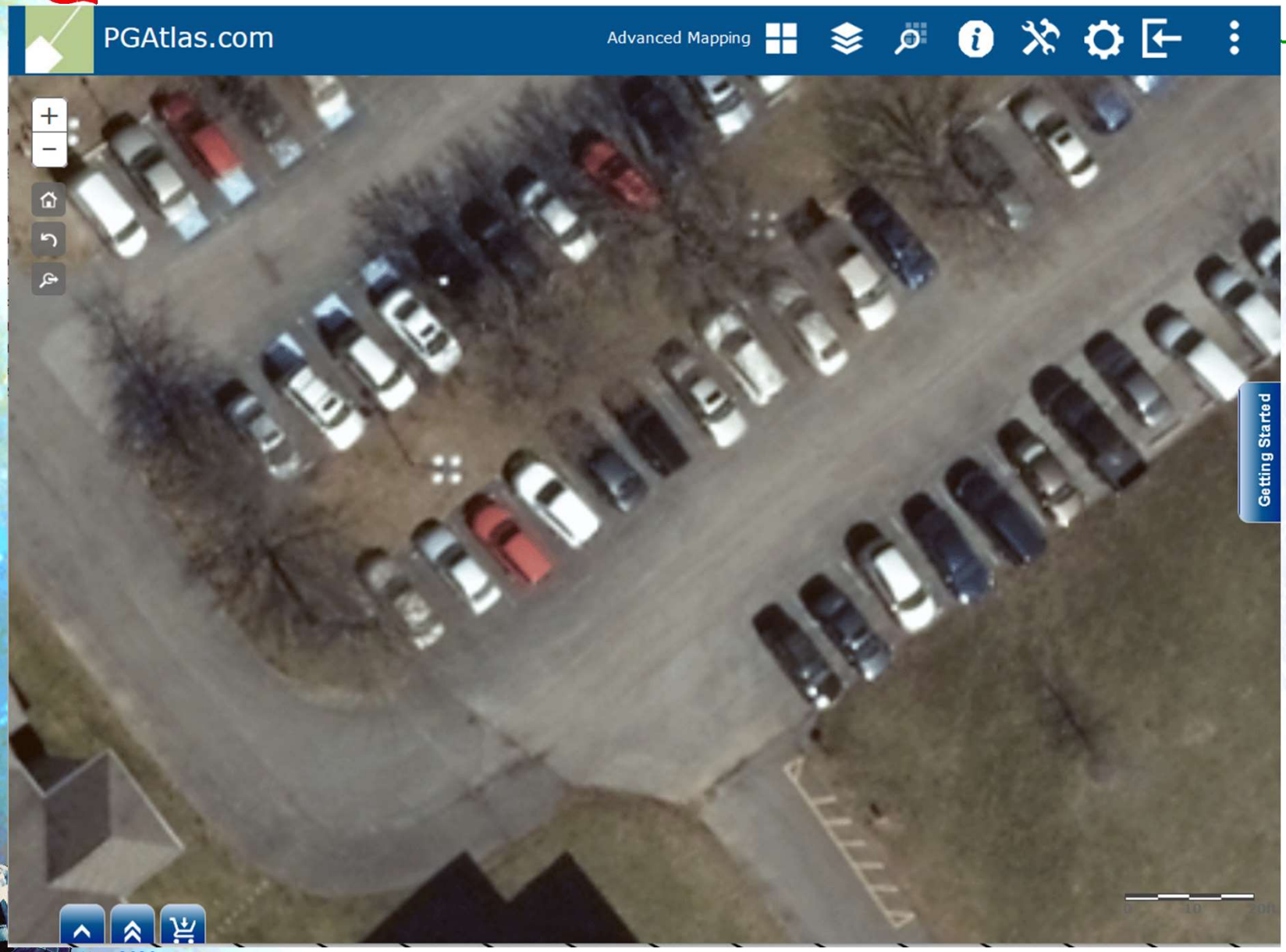
Alexandria
Prince William
Charles
Calvert
0
2
4mi

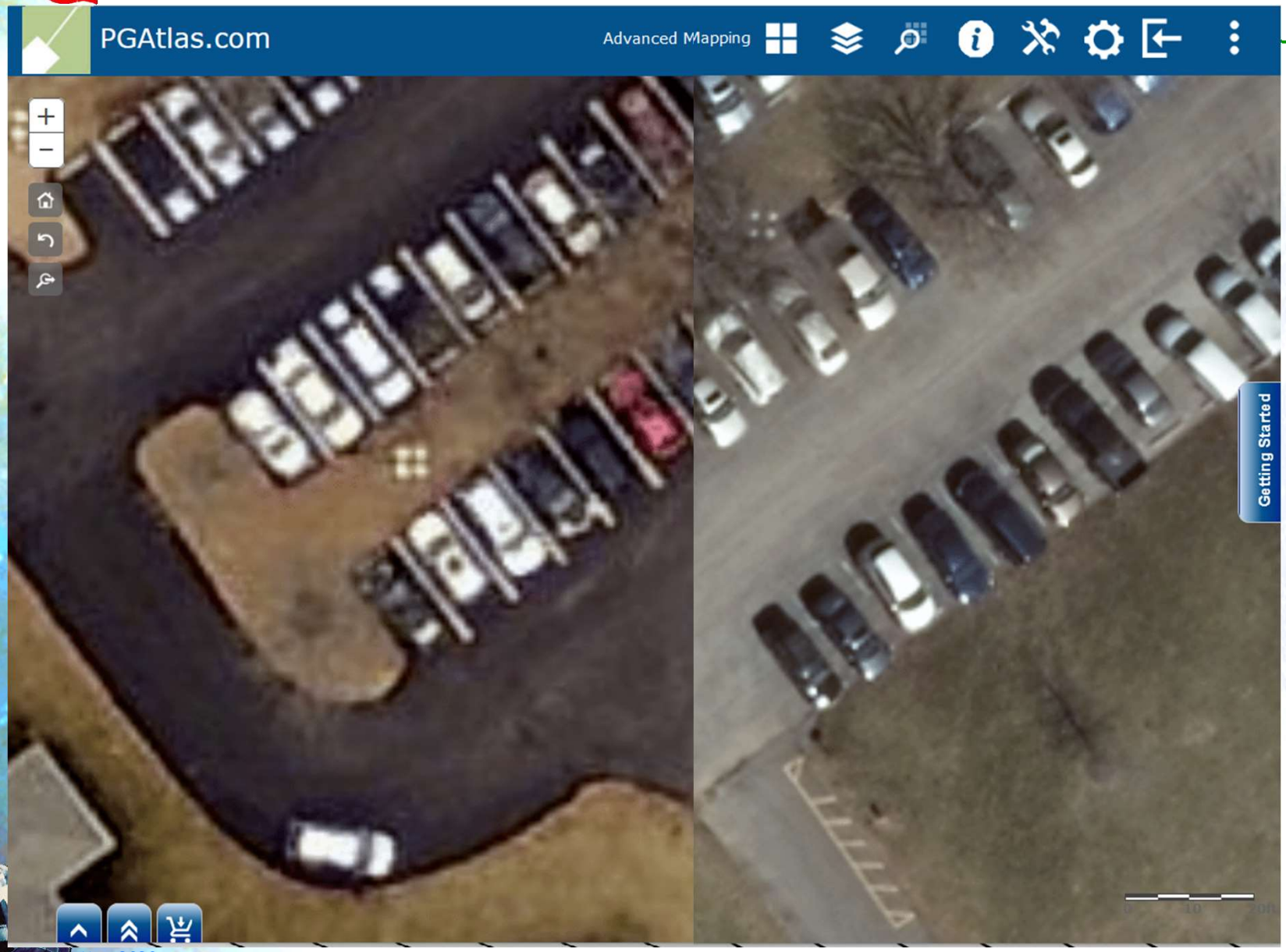
PGAtlas.com 2017 6-inch

PGAtlas.com 1938 12-inch

PGAtlas.com



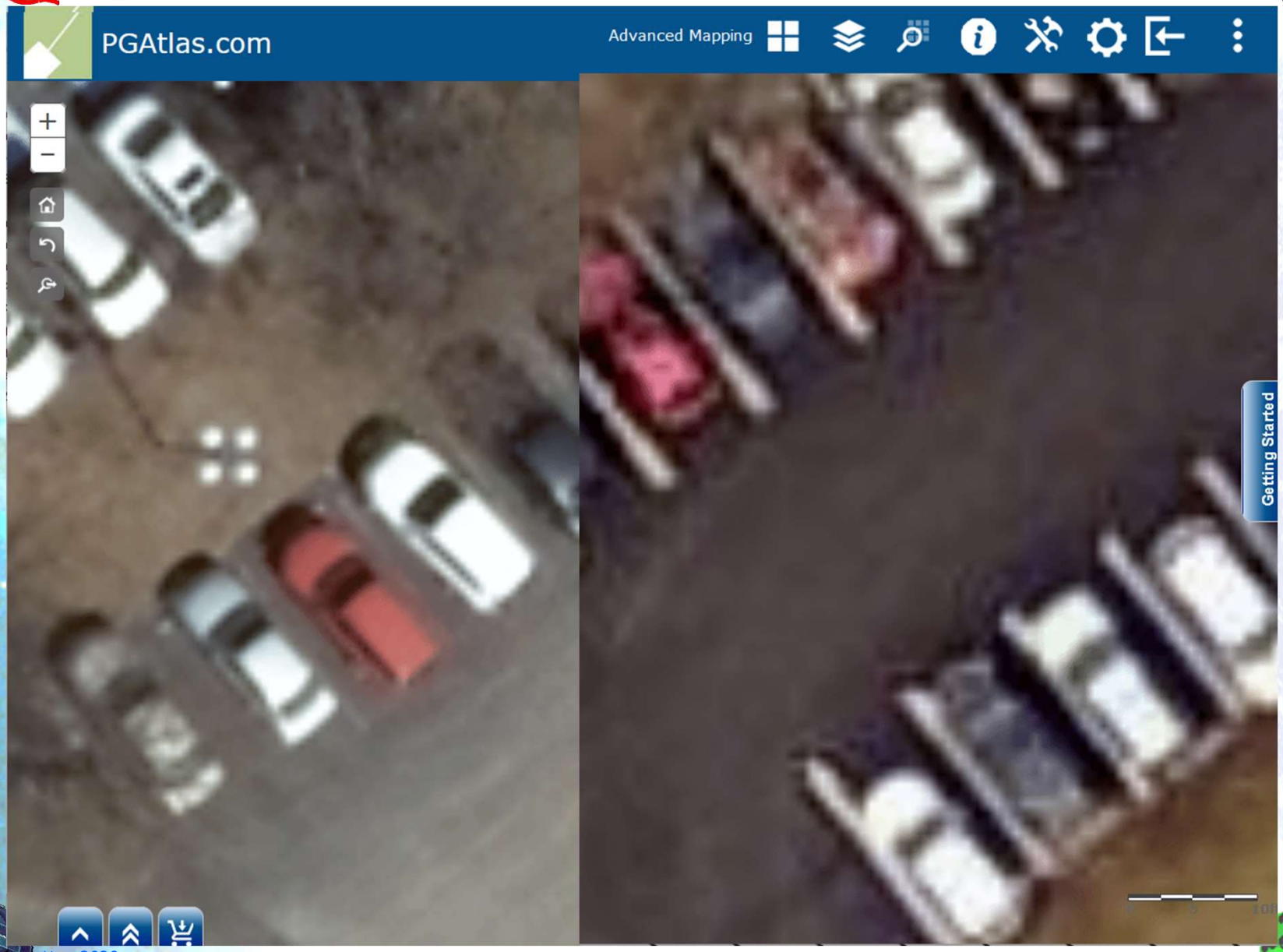
PGAtlas.com



6-inch

PGAtlas.com

9-inch



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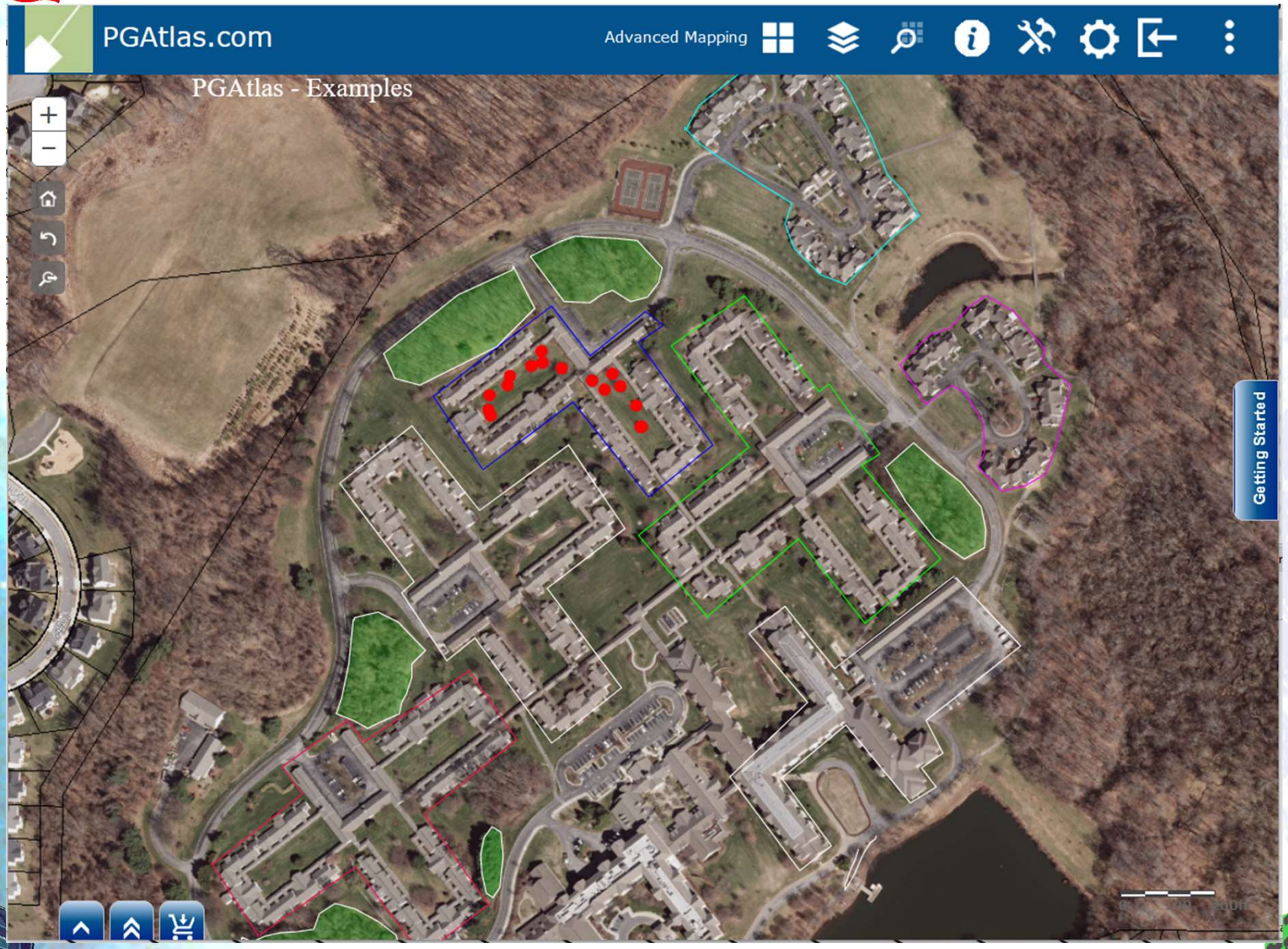
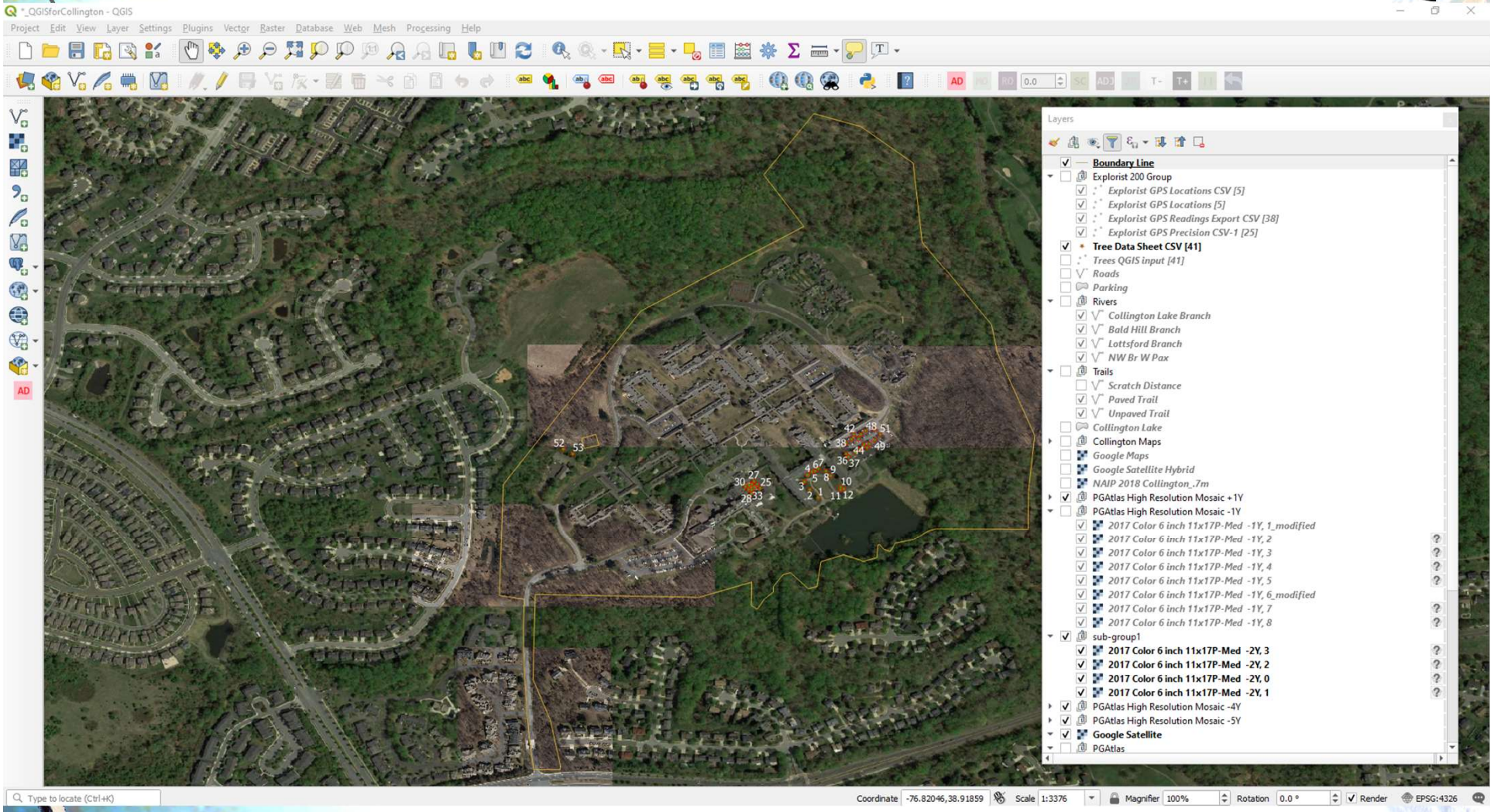

PGAtlas.com
Advanced Mapping
PGAtlas - Examples
Getting Started

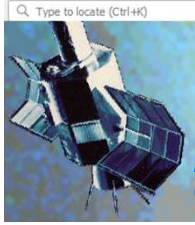
PGAtlas.com

PGAtlas.com

- **Great Source for Images**
- **Great Source for Property Information**
- **Can Input Geometry**
  - Geometry changes to JPG image
  - Difficult to Edit
  - Exterior Data base required
  - Not interactive as desired

QGIS

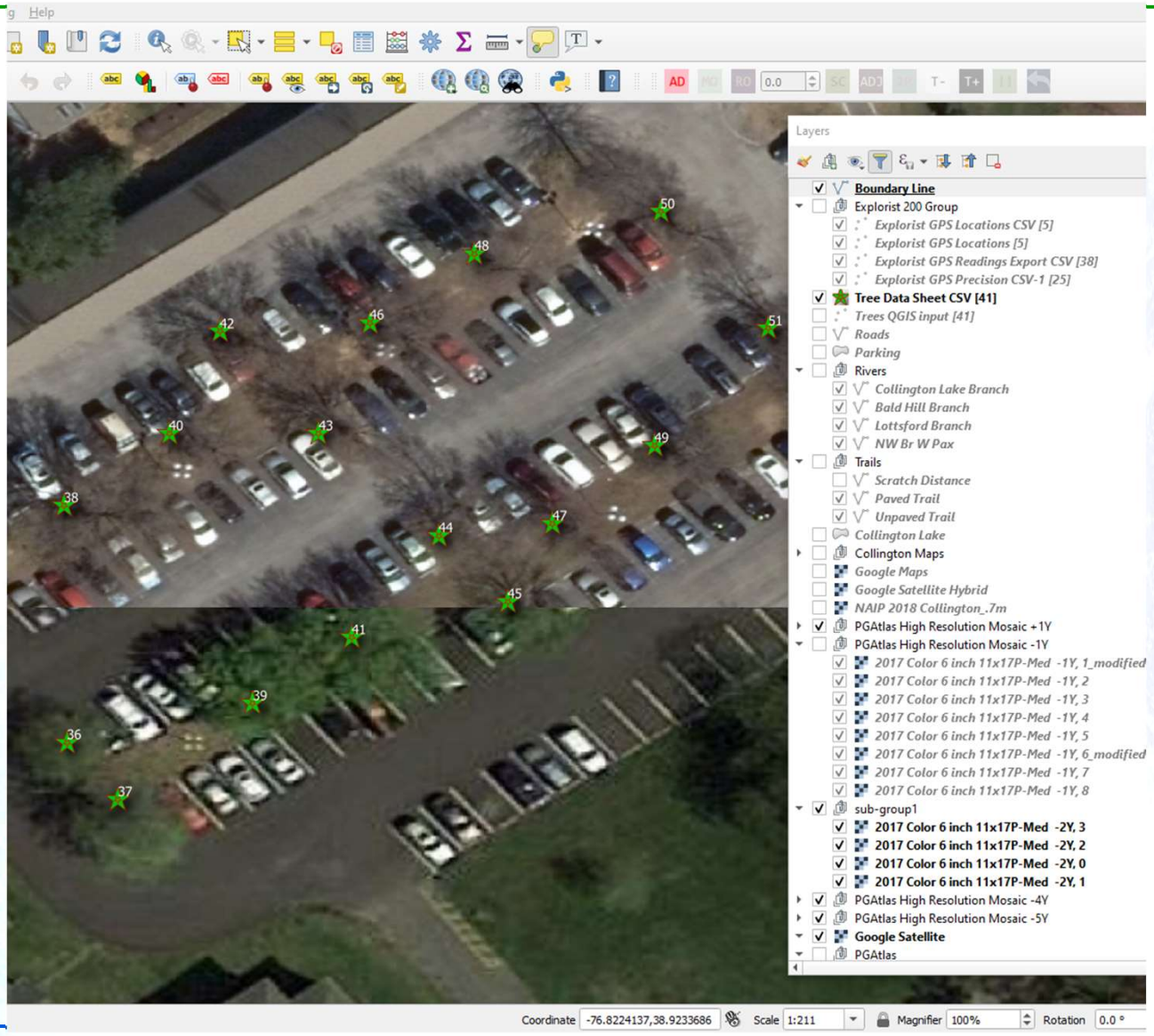

*_QGISforCollington - QGIS
Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Processing Help
Layers
Boundary Line
Explorist 200 Group
Explorist GPS Locations CSV [5]
Explorist GPS Locations [5]
Explorist GPS Readings Export CSV [38]
Explorist GPS Precision CSV-1 [25]
Tree Data Sheet CSV [41]
Trees QGIS input [41]
Roads
Parking
Rivers
Collington Lake Branch
Bald Hill Branch
Lottsford Branch
NW Br W Pax
Trails
Scratch Distance
Paved Trail
Unpaved Trail
Collington Lake
Collington Maps
Google Maps
Google Satellite Hybrid
NAIP 2018 Collington_.7m
PGAtlas High Resolution Mosaic +1Y
PGAtlas High Resolution Mosaic -1Y
2017 Color 6 inch 11x17P-Med -1Y, 1_modified
2017 Color 6 inch 11x17P-Med -1Y, 2
2017 Color 6 inch 11x17P-Med -1Y, 3
2017 Color 6 inch 11x17P-Med -1Y, 4
2017 Color 6 inch 11x17P-Med -1Y, 5
2017 Color 6 inch 11x17P-Med -1Y, 6_modified
2017 Color 6 inch 11x17P-Med -1Y, 7
2017 Color 6 inch 11x17P-Med -1Y, 8
sub-group1
2017 Color 6 inch 11x17P-Med -2Y, 3
2017 Color 6 inch 11x17P-Med -2Y, 2
2017 Color 6 inch 11x17P-Med -2Y, 0
2017 Color 6 inch 11x17P-Med -2Y, 1
PGAtlas High Resolution Mosaic -4Y
PGAtlas High Resolution Mosaic -5Y
Google Satellite
PGAtlas
Type to locate (Ctrl+K)
Coordinate -76.82046,38.91859
Scale 1:3376
Magnifier 100%
Rotation 0.0 °
Render
EPSG:4326



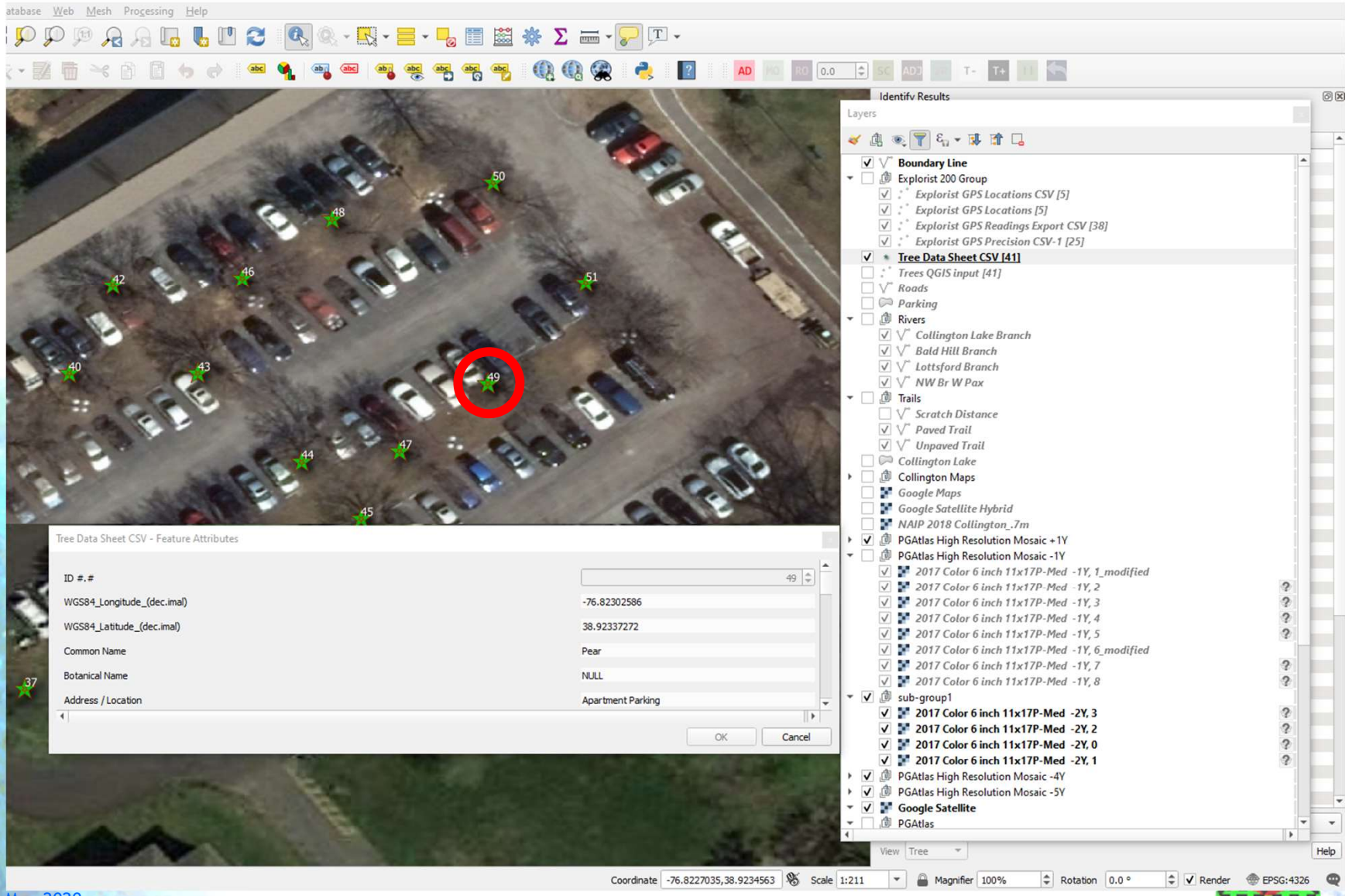
QGIS

Images from PGAtlas.com

Images from Google Satellite



QGIS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2017 Color 6 inch 11x17P-Med -1Y, 5
2017 Color 6 inch 11x17P-Med -1Y, 6_modified
2017 Color 6 inch 11x17P-Med -1Y, 7
2017 Color 6 inch 11x17P-Med -1Y, 8
sub-group1
2017 Color 6 inch 11x17P-Med -2Y, 3
2017 Color 6 inch 11x17P-Med -2Y, 2
2017 Color 6 inch 11x17P-Med -2Y, 0
2017 Color 6 inch 11x17P-Med -2Y, 1
PGAtlas High Resolution Mosaic -4Y
PGAtlas High Resolution Mosaic -5Y
Google Satellite
PGAtlas
Tree Data Sheet CSV - Feature Attributes
ID #.#
49
WGS84_Longitude_(dec.imal)
-76.82302586
WGS84_Latitude_(dec.imal)
38.92337272
Common Name
Pear
Botanical Name
NULL
Address / Location
Apartment Parking
OK
Cancel
Coordinate
-76.8227035,38.9234563
Scale
1:211
Magnifier
100%
Rotation
0.0 °
Render
EPSG:4326

QGIS

- **Can map trees**
  - Not limited to Trees
  - Any Geographically Mappable Data

- **Interact with Excel Spreadsheet Database**
  - Editable
  - Updateable
  - Sortable
  - Embed images of any tree or object

GIS Links

- Prince George's County Interactive Geographical Information System (MNCPPC) - PGAtlas.com
- Maryland High Resolution Orthoimagery
- United States Geological Survey (USGS)
- United States Forest Service (i-Tree)
- ArcGIS ($100/yr) paid version of QGIS
- QGIS and Related Links
  - YouTube "classes"