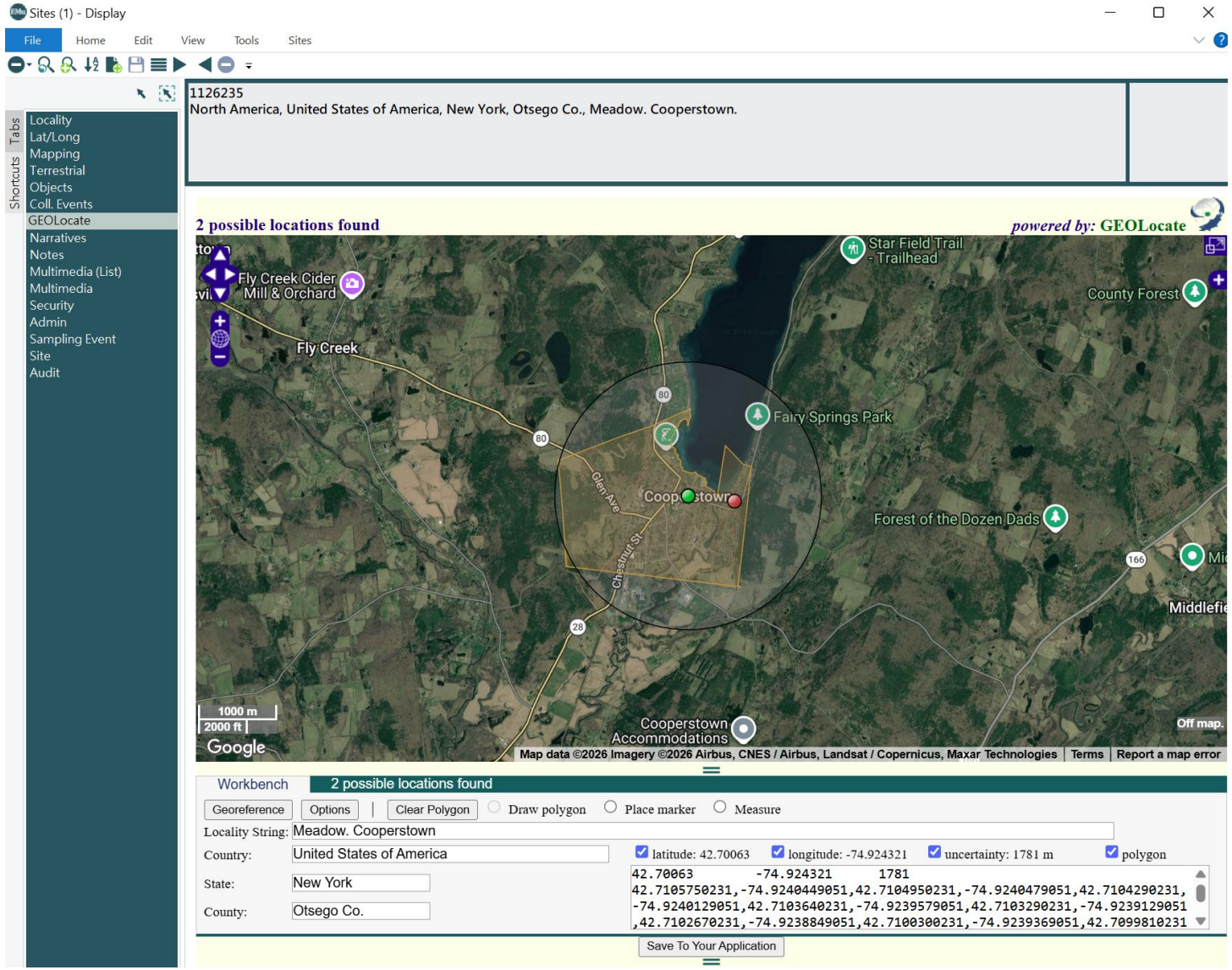
The GEOLocate Tab in EMu 9.1



NYBG
New York Botanical Garden

Liz Gjieli, Geographical Information Manager

Goals

- Basic understanding of georeferencing
- Learn how to utilize the new integrated GEOLocate tab
- Learn what metadata capture is important when georeferencing

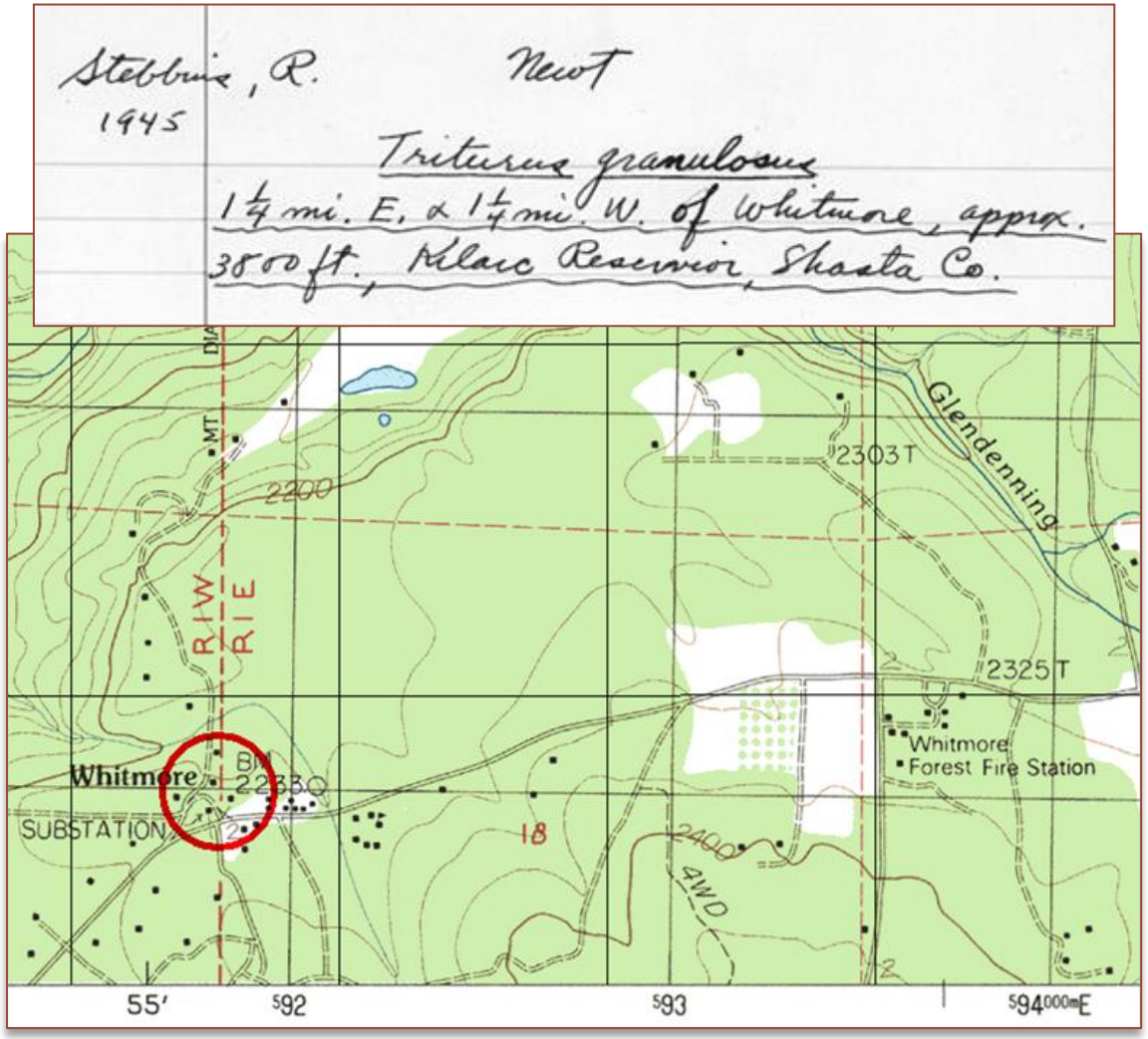
Georeferencing Basics

Understanding the general workflow and protocols followed at NYBG

What is Georeferencing?

The process of translating a textual description of a place into:

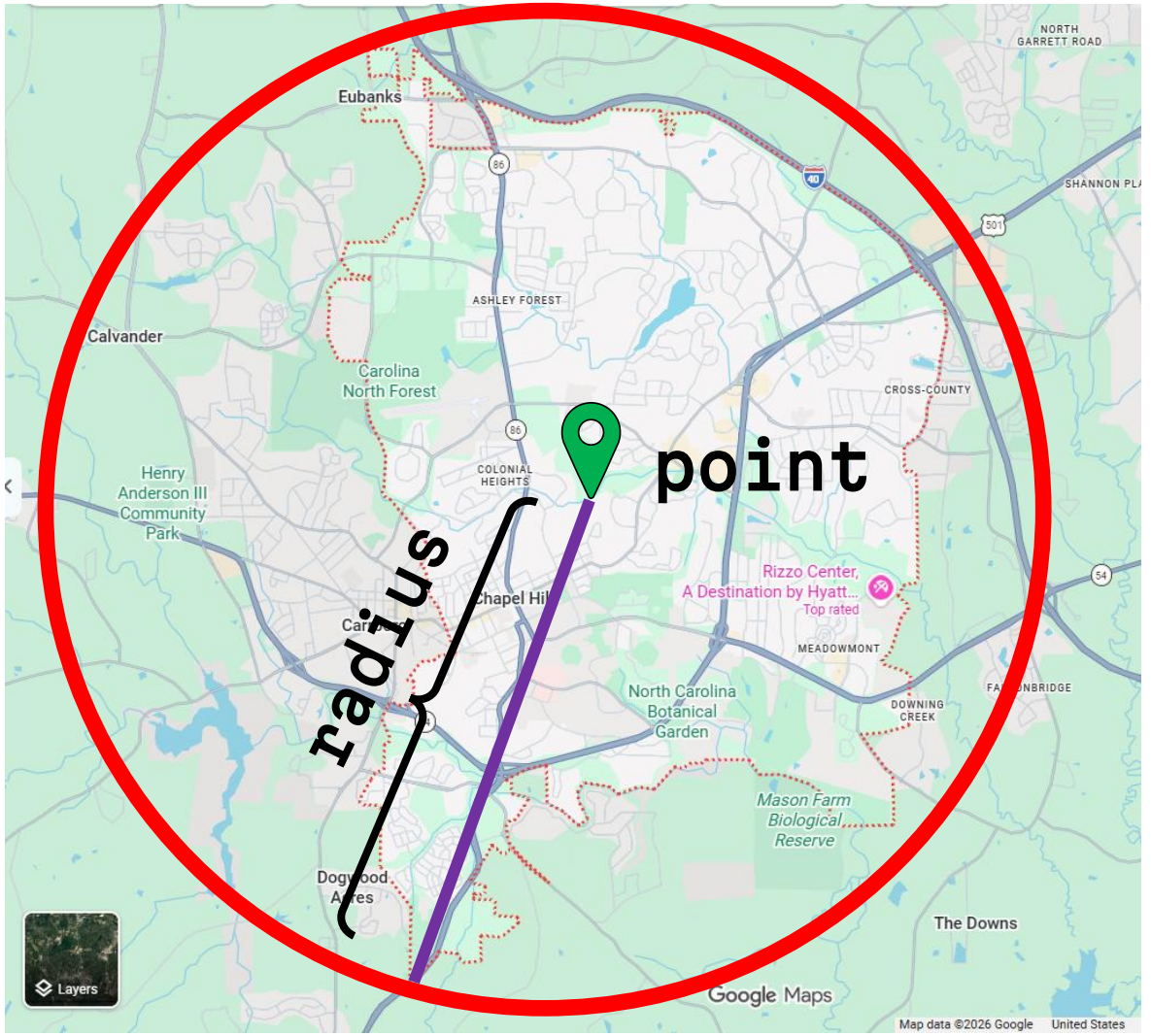
- **Mappable coordinates**
- **An uncertainty radius**



The Point Radius Method

The best estimate of where the specimen was collected and the uncertainty associated with that location.

- **Point** = estimated collection location (latitude and longitude)
- **Radius** = maximum distance from the point within which the collection likely occurred



Categorizing Locality Type

- Locality type determines the georeferencing steps
- Different locality types require different approaches
- The Georeferencing Quick Reference Guide provides step-wise instructions for each type

Features	
§2.1.1 With Obvious Extent 	Step 1: Determine the feature boundaries. Step 2: Determine the coordinates of the corrected center of the feature for *Input Latitude* and *Longitude*. Step 3: Measure the geographic radial.
Offsets	
§2.2.4 Distance along Orthogonal Directions 	Step 1: Determine the boundary of the feature using the appropriate method for Geographic Feature only (§2.1). Step 2: Determine and use the coordinates of the corrected center and geographic radial of the estimated feature boundaries as the *Input Latitude* and *Longitude*.
§2.2.5 Distance at a Heading	Step 1: Determine the starting feature using the appropriate method for Geographic Feature only (§2.1). Step 2: Determine and use the starting feature coordinates and the geographic radial.

Appendix A: Key to Locality Types

Identifying the Feature

Identify the most specific mappable feature:

- **Georeference if the feature can be located confidently**
- **If not, use the next broader geographic feature**

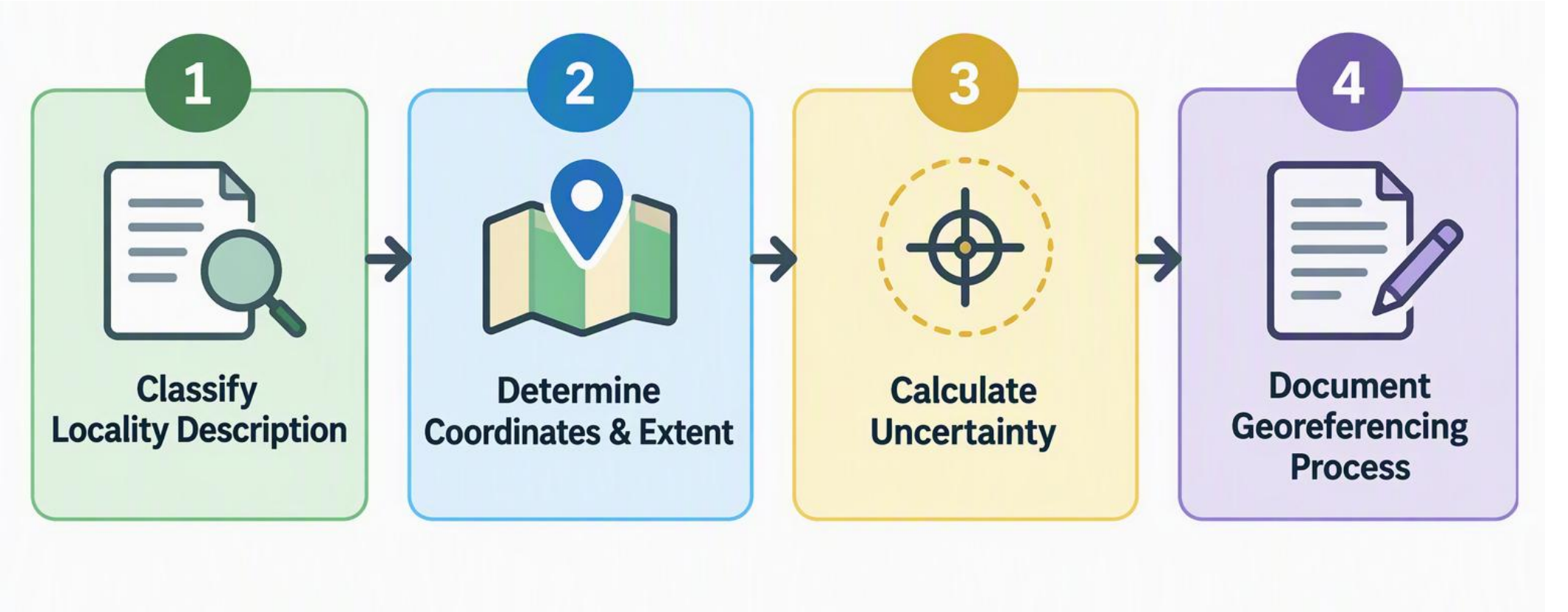




Example: Turtle Pond, Central Park, Manhattan
Best option: Turtle Pond

If Turtle Pond cannot be located, georeference the next most specific locality (Central Park). This results in a larger uncertainty radius.

General Workflow

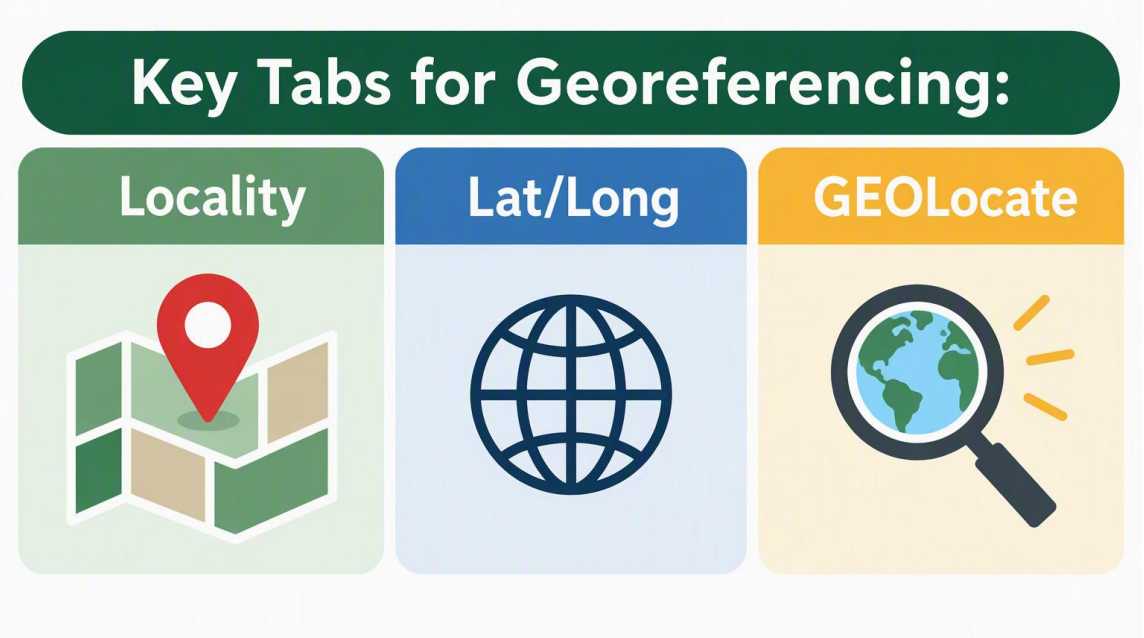


EMu

Entering Data into the Sites Module

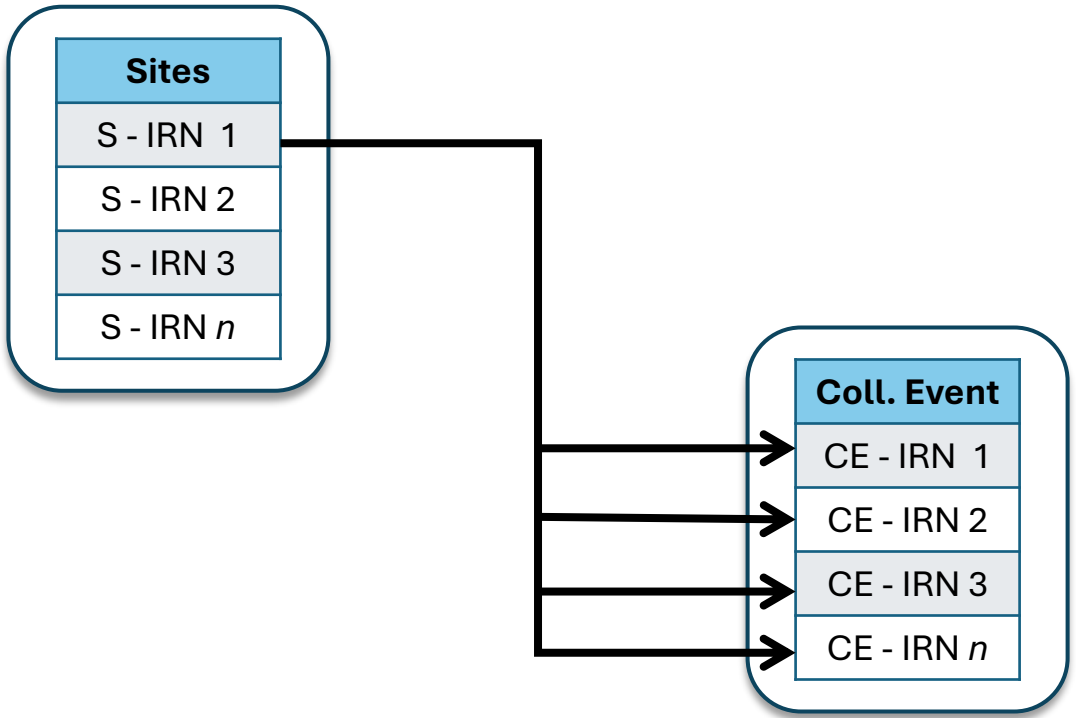
Sites Module

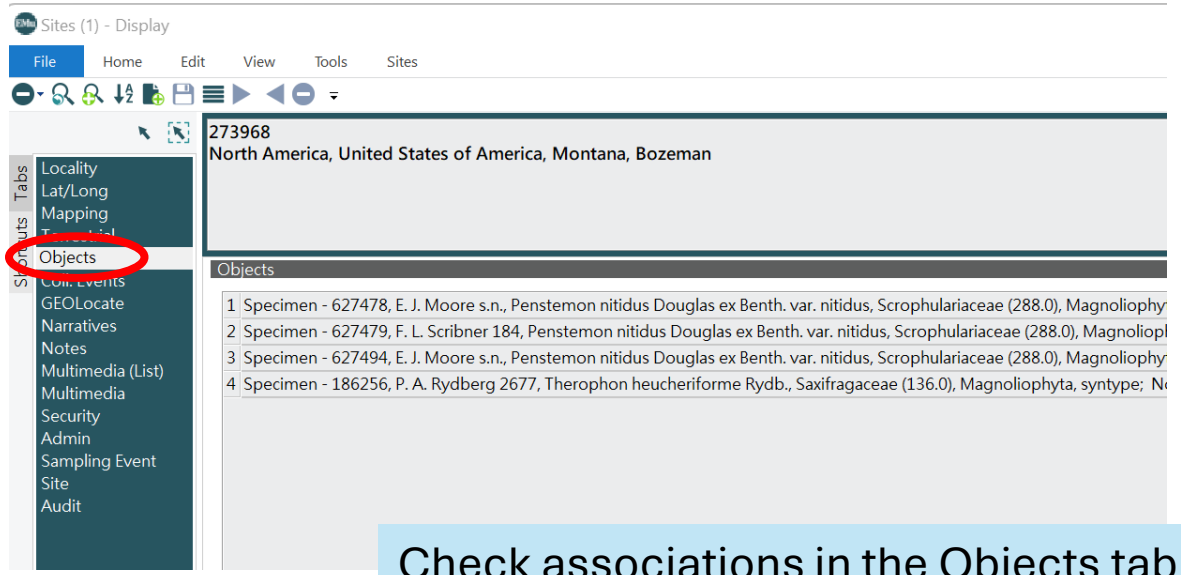
- Stores geographic information associated with a collection event
- Captures locality details, including place names and hierarchical administrative divisions
- Maintains coordinates and mapping information



Relational Database

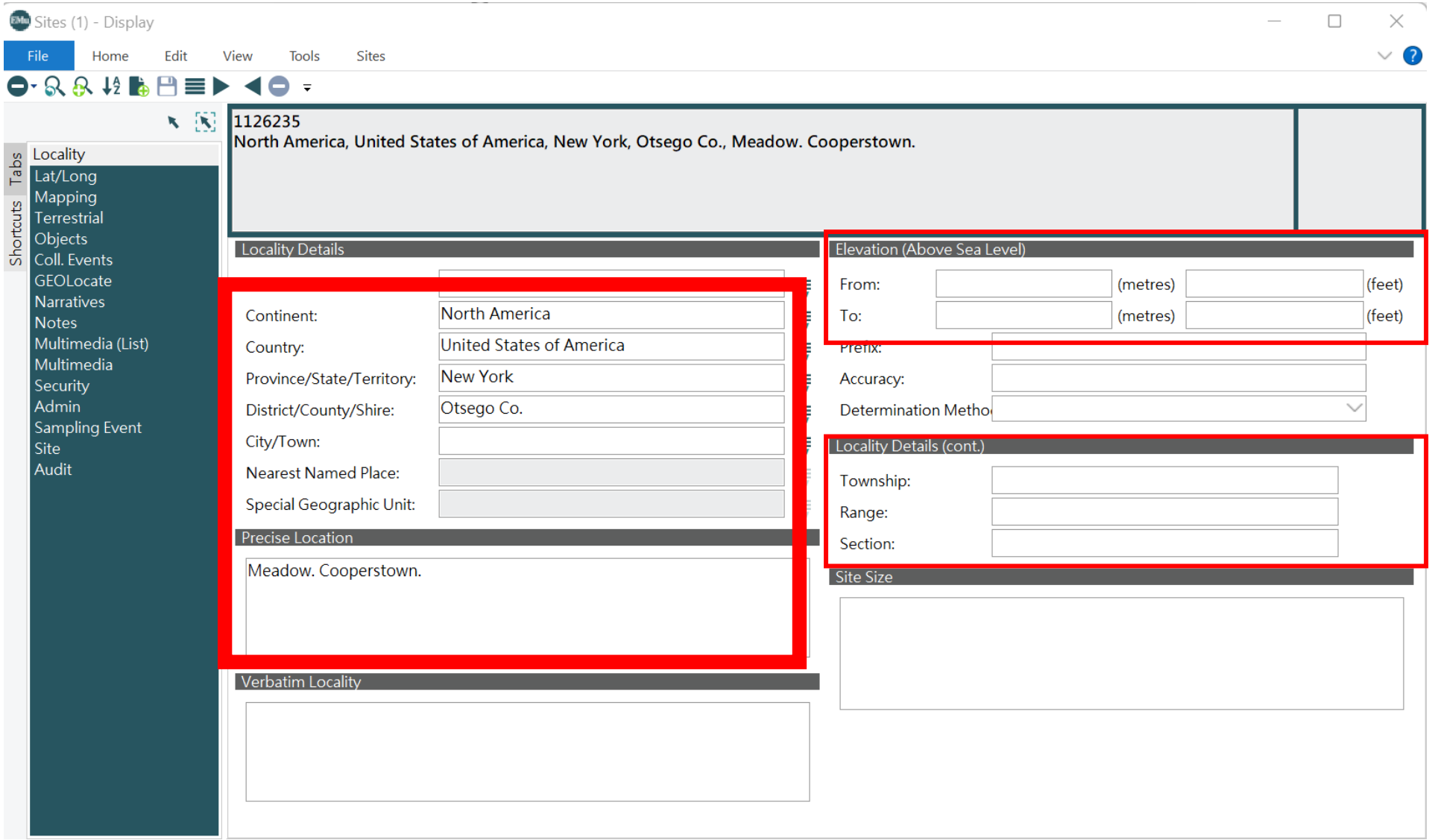
- One **Sites record** may be linked to many **Collection Event/Catalogue records.**
- Changes to one Sites record can affect many records
- Review attached records carefully before making edits!



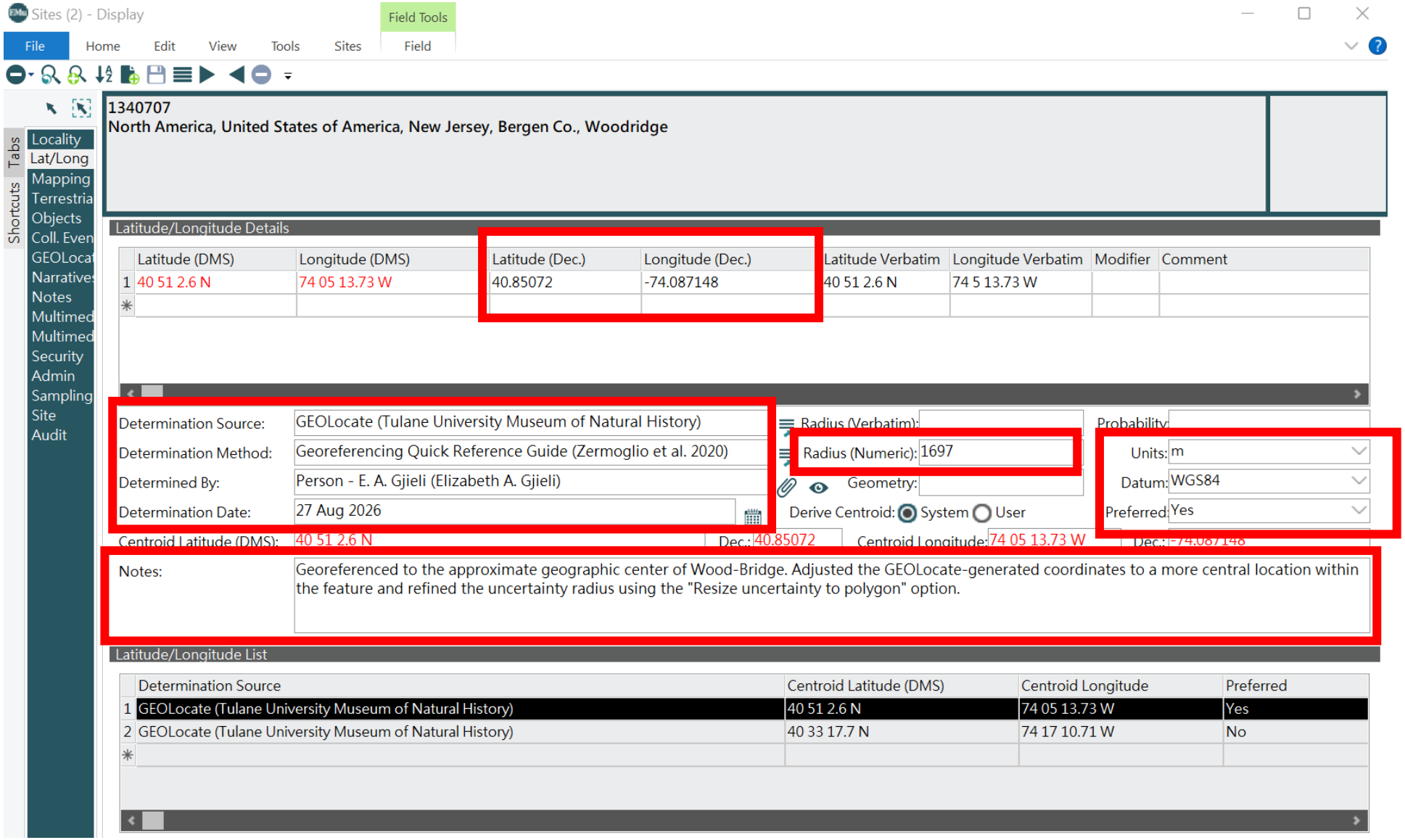


Check associations in the Objects tab or View > Reverse Attachments

Locality Tab

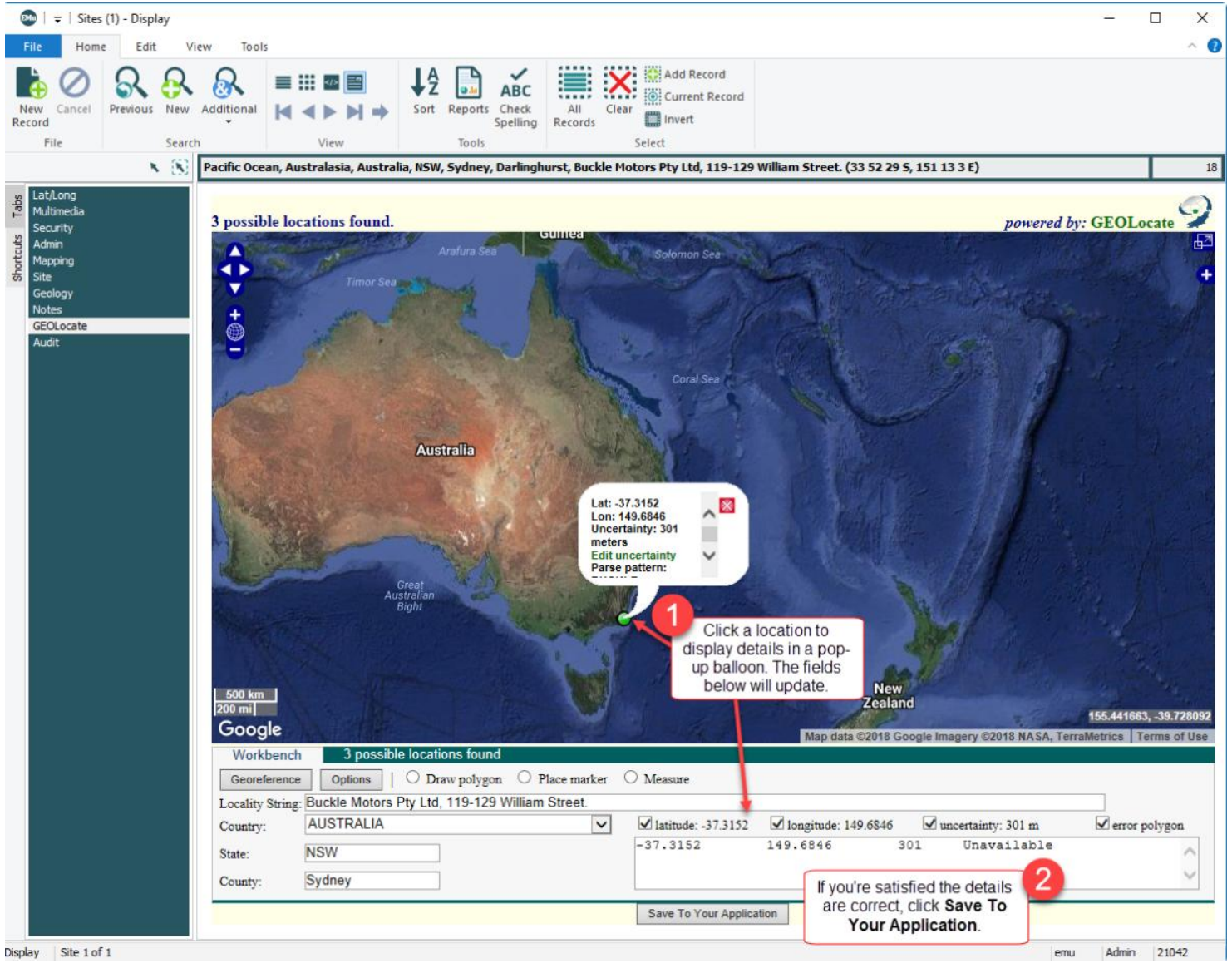


Lat/Long Tab


Sites (2) - Display
Field Tools
File
Home
Edit
View
Tools
Sites
Field
1340707
North America, United States of America, New Jersey, Bergen Co., Woodridge
Tabs
Shortcuts
Locality
Lat/Long
Mapping
Terrestria
Objects
Coll. Even
GEOLocat
Narratives
Notes
Multimed
Multimed
Security
Admin
Sampling
Site
Audit
Latitude/Longitude Details
Latitude (DMS)
Longitude (DMS)
Latitude (Dec.)
Longitude (Dec.)
Latitude Verbatim
Longitude Verbatim
Modifier
Comment
1 40 51 2.6 N
74 05 13.73 W
40.85072
-74.087148
40 51 2.6 N
74 5 13.73 W
Determination Source: GEOLocate (Tulane University Museum of Natural History)
Determination Method: Georeferencing Quick Reference Guide (Zermoglio et al. 2020)
Determined By: Person - E. A. Gjieli (Elizabeth A. Gjieli)
Determination Date: 27 Aug 2026
Radius (Verbatim):
Probability:
Radius (Numeric): 1697
Units: m
Datum: WGS84
Geometry:
Preferred: Yes
Derive Centroid: System User
Centroid Latitude (DMS): 40 51 2.6 N
Dec.: 40.85072
Centroid Longitude: 74 05 13.73 W
Dec.: -74.087148
Notes: Georeferenced to the approximate geographic center of Wood-Bridge. Adjusted the GEOLocate-generated coordinates to a more central location within the feature and refined the uncertainty radius using the "Resize uncertainty to polygon" option.
Latitude/Longitude List
Determination Source
Centroid Latitude (DMS)
Centroid Longitude
Preferred
1 GEOLocate (Tulane University Museum of Natural History) 40 51 2.6 N 74 05 13.73 W Yes
2 GEOLocate (Tulane University Museum of Natural History) 40 33 17.7 N 74 17 10.71 W No

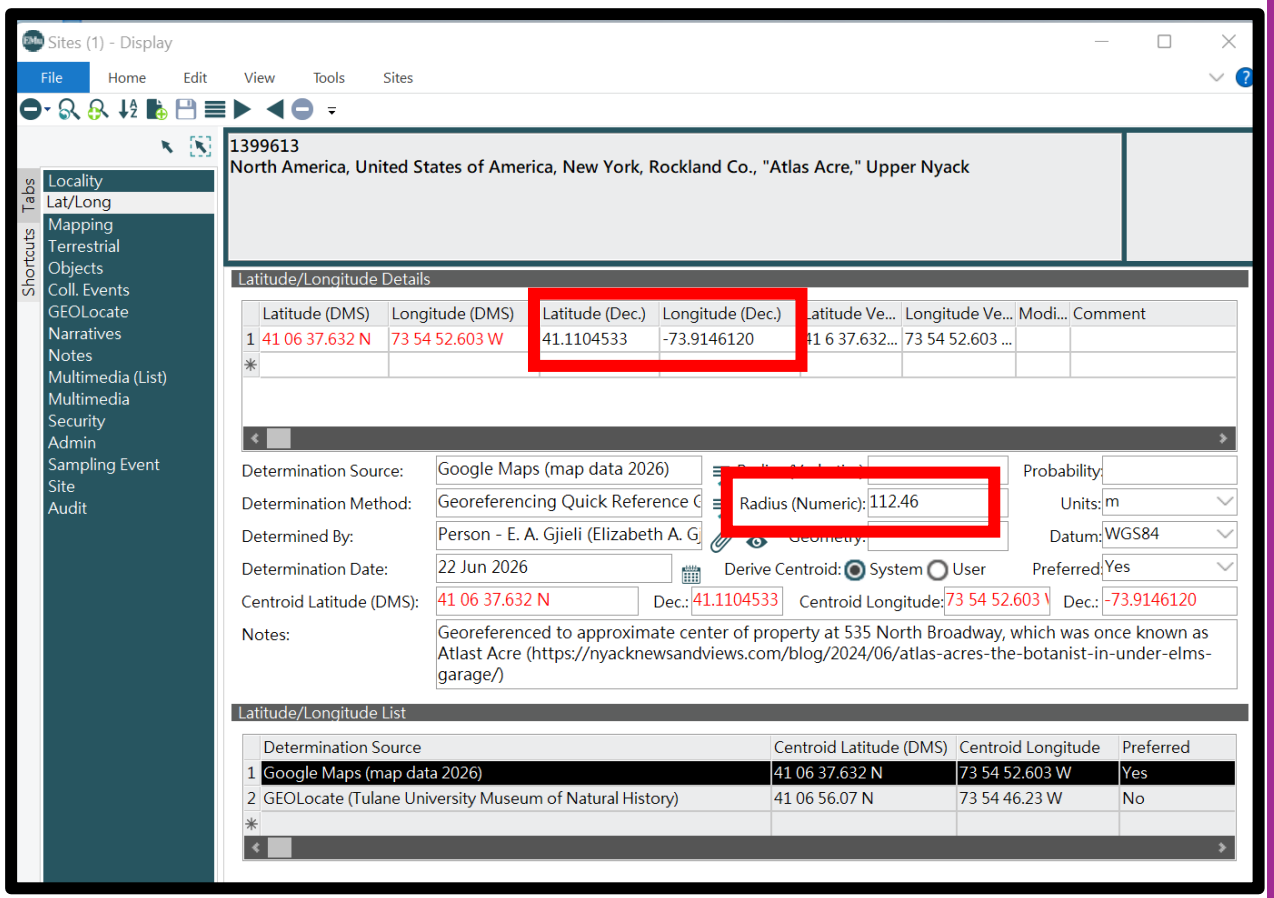
GEOLocate Tab

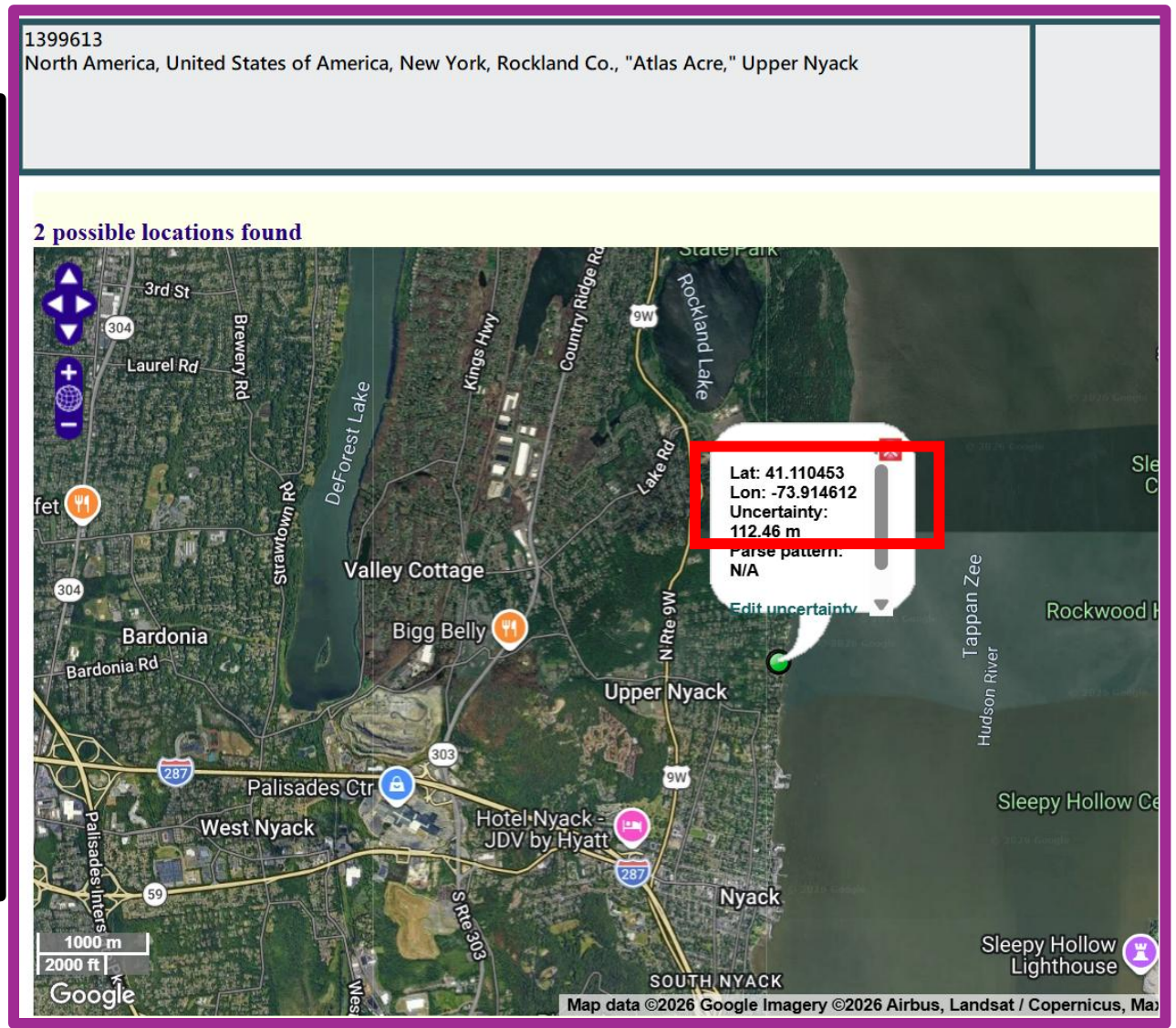
- Connects to the GEOLocate web service
- Uses locality details to suggest possible map locations
- Interactive map editing similar to the GEOLocate web client
- Best performance for localities in the U.S., Canada, and Europe



https://help.emu.axiell.com/v10/en/Topics/EMu/Sites%20module.htm

Mapping Existing Coordinates





GEOLocate Georeferencing

GEOLocate works best for simple, well-defined localities

- **Feature – with Obvious Spatial Extent**
  Example: Cooperstown, Otsego Co., New York, USA

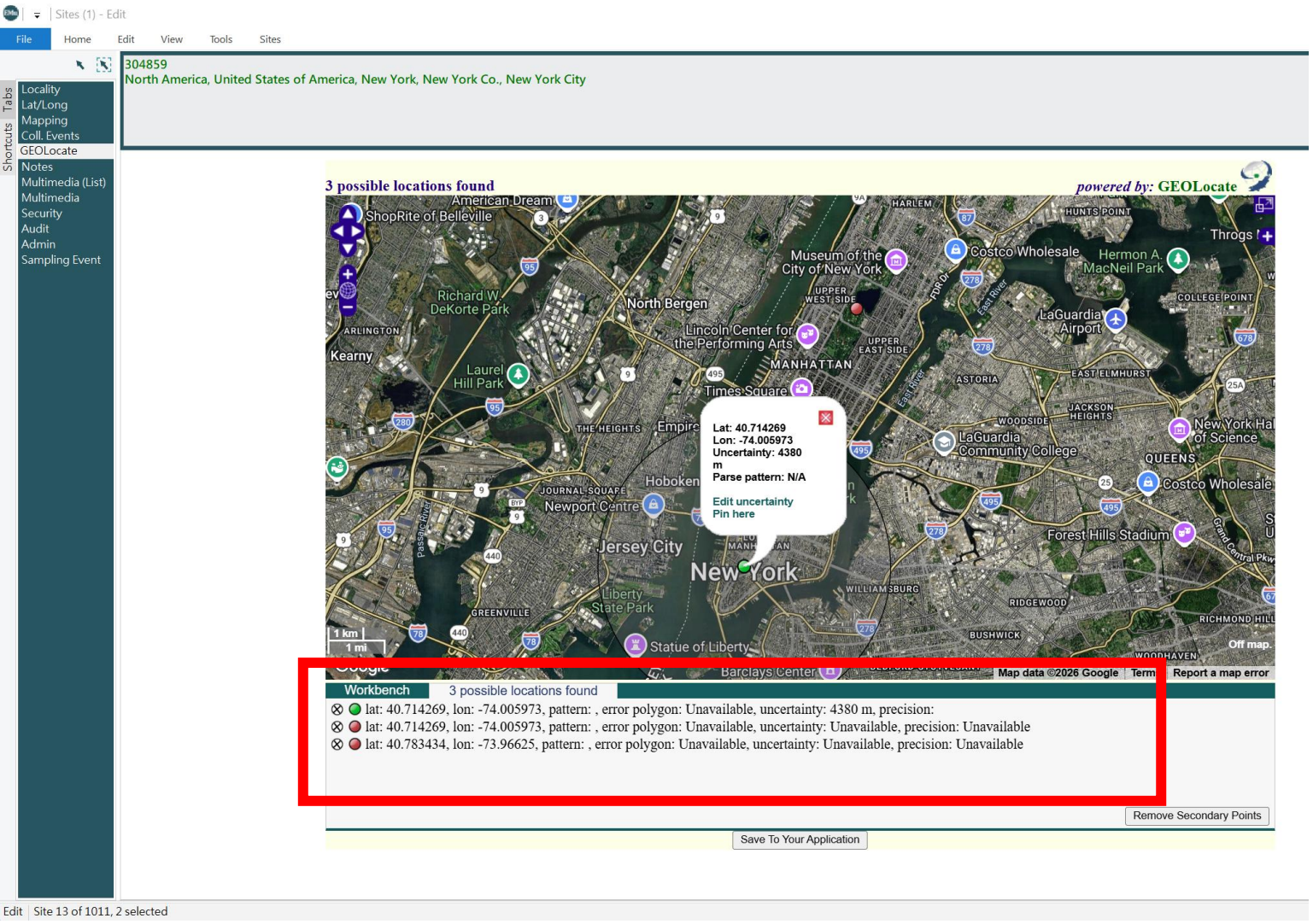
- **Offset – Distance at a Heading**
  Example: 50 mi W of Las Vegas

- **Offset – Distance along Orthogonal Directions**
  Example: 6 km N and 4 km W of Welna

- **Coordinate conversion**
  Example: Township, Range, Section to Decimal Degrees

Georeferencing Quick Reference Guide (2020)

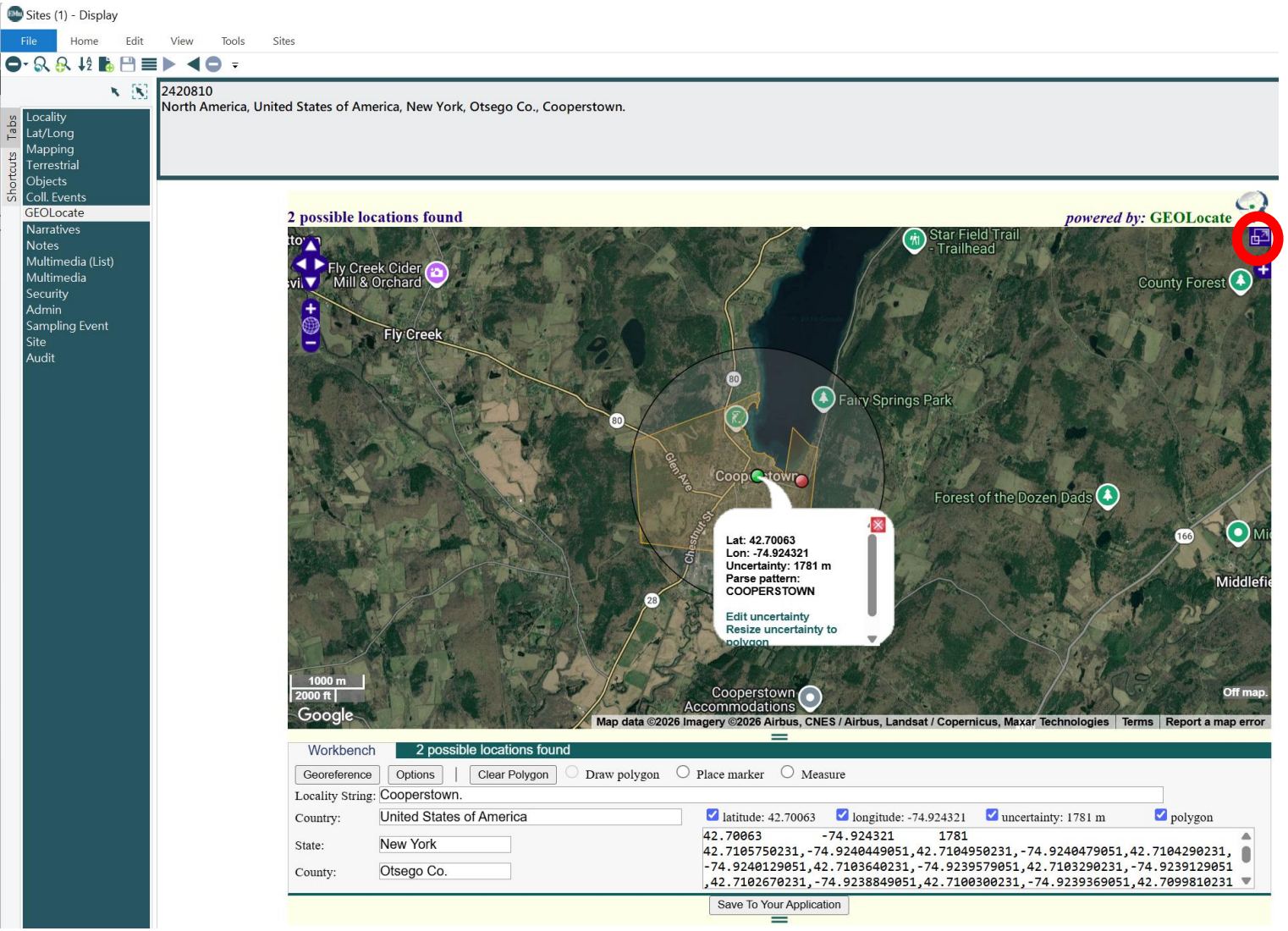
Possible Locations



If multiple location matches are found, they appear in the "Possible Locations Found" tab

- **Green dot** = recommended location
- **Red dot(s)** = other possible location matches

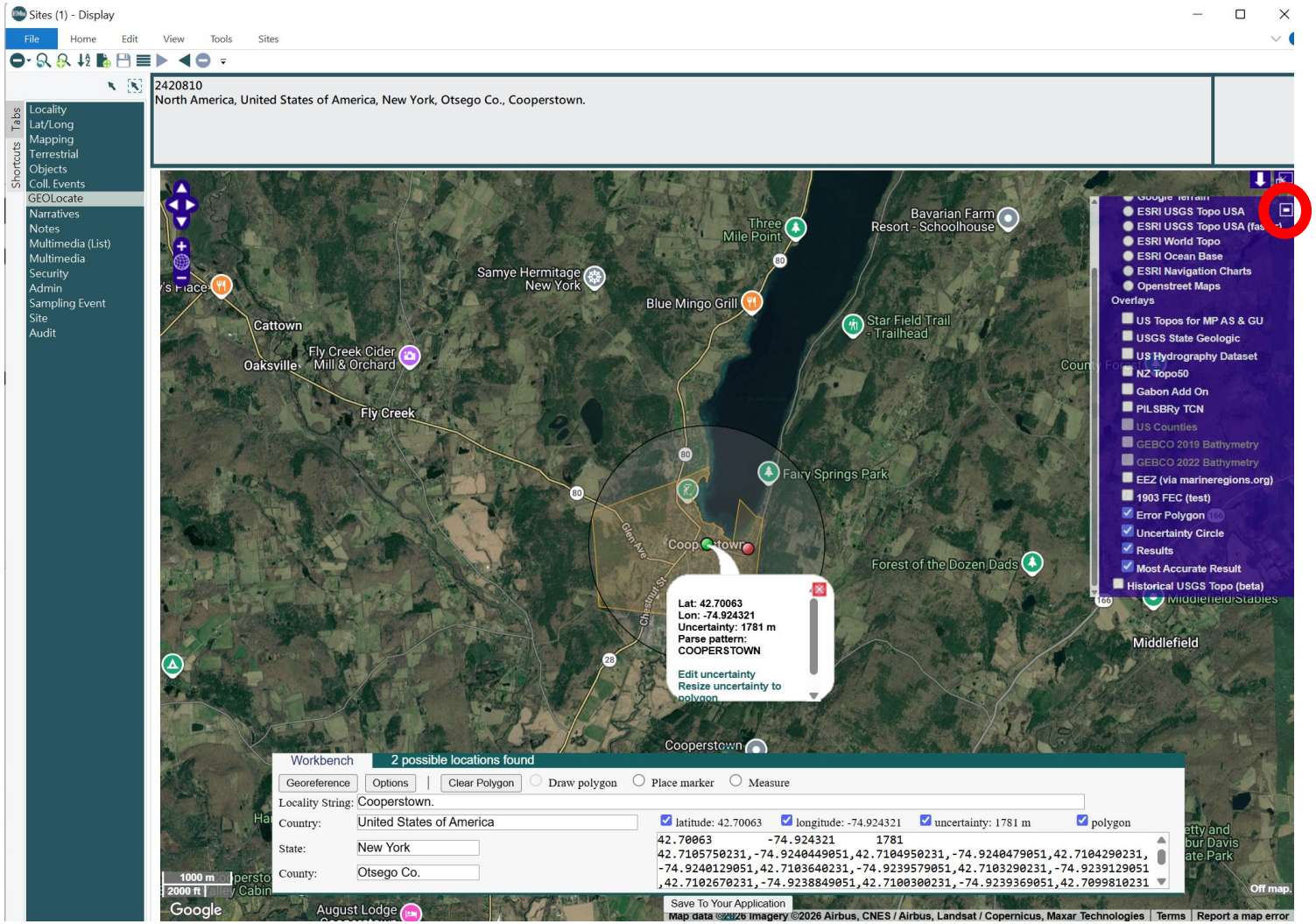
Full Screen Map View



- Larger workspace for georeferencing
- Easier to view the full extent of a locality
- Useful for large areas and complex localities

Map Layers (Optional)

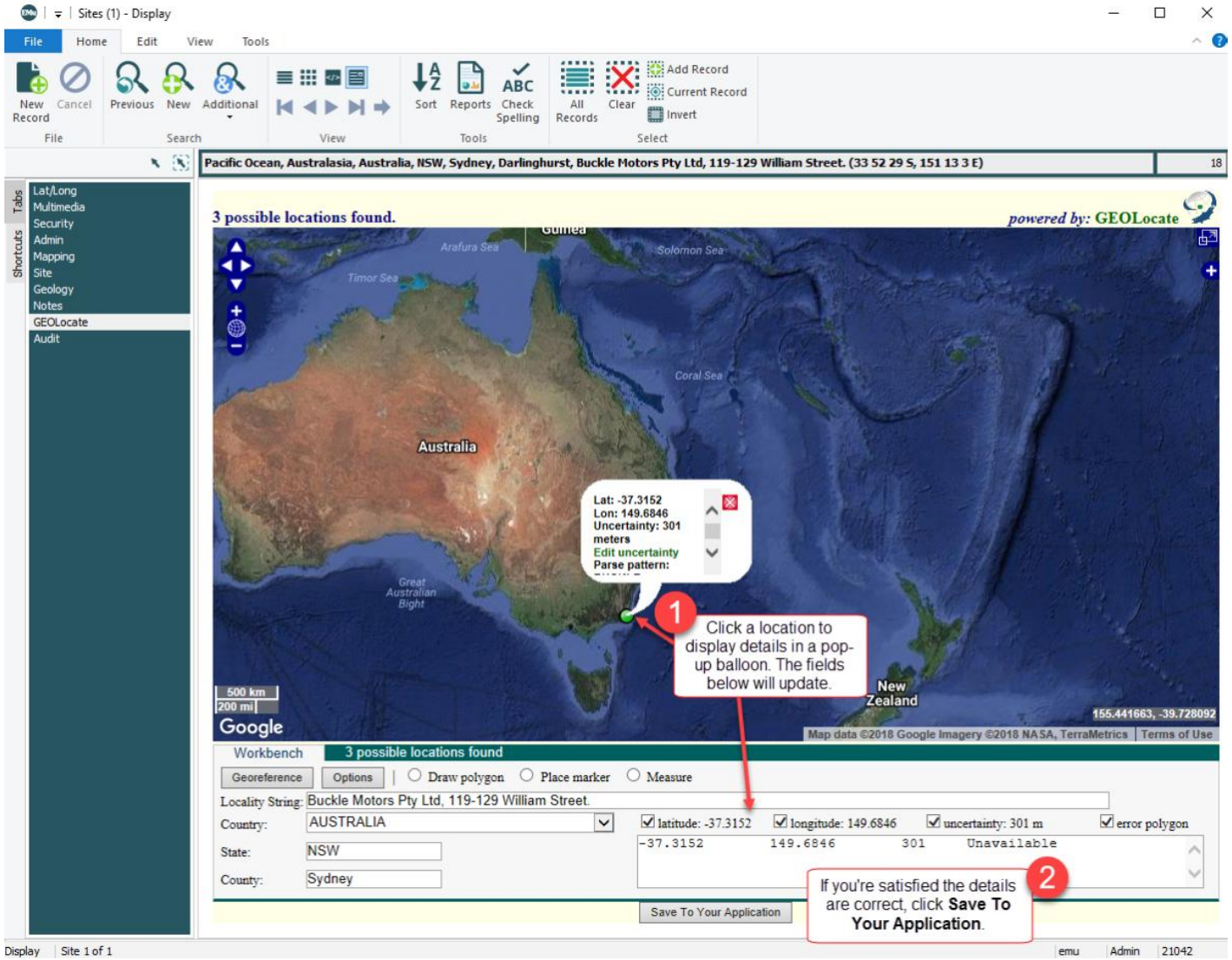
- View different basemaps using the "+" button
- Basemaps can help identify roads, waterways, boundaries, and terrain
- Historical USGS maps may help locate historical features not shown on modern maps



Saving

Click a location on the map to display details in a popup balloon. The fields below will display the location details.

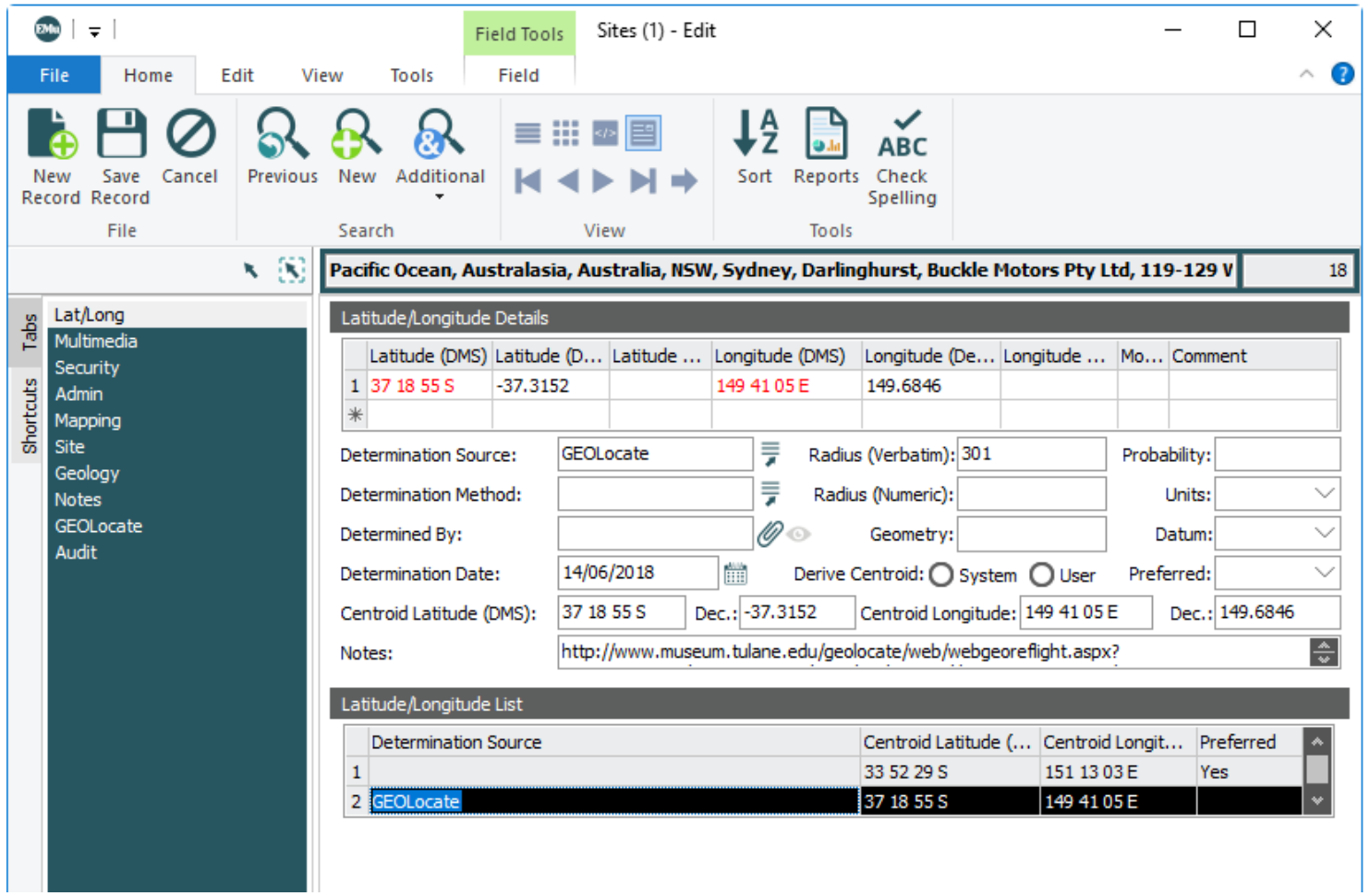
If you wish to record the location details, click **Save To Your Application.**



Saving: Updating Latitude/Longitude List

A row is added to the *Latitude/Longitude List* table (Lat/Long tab) with the geolocation details.

It is possible to add multiple georeferences to the table.



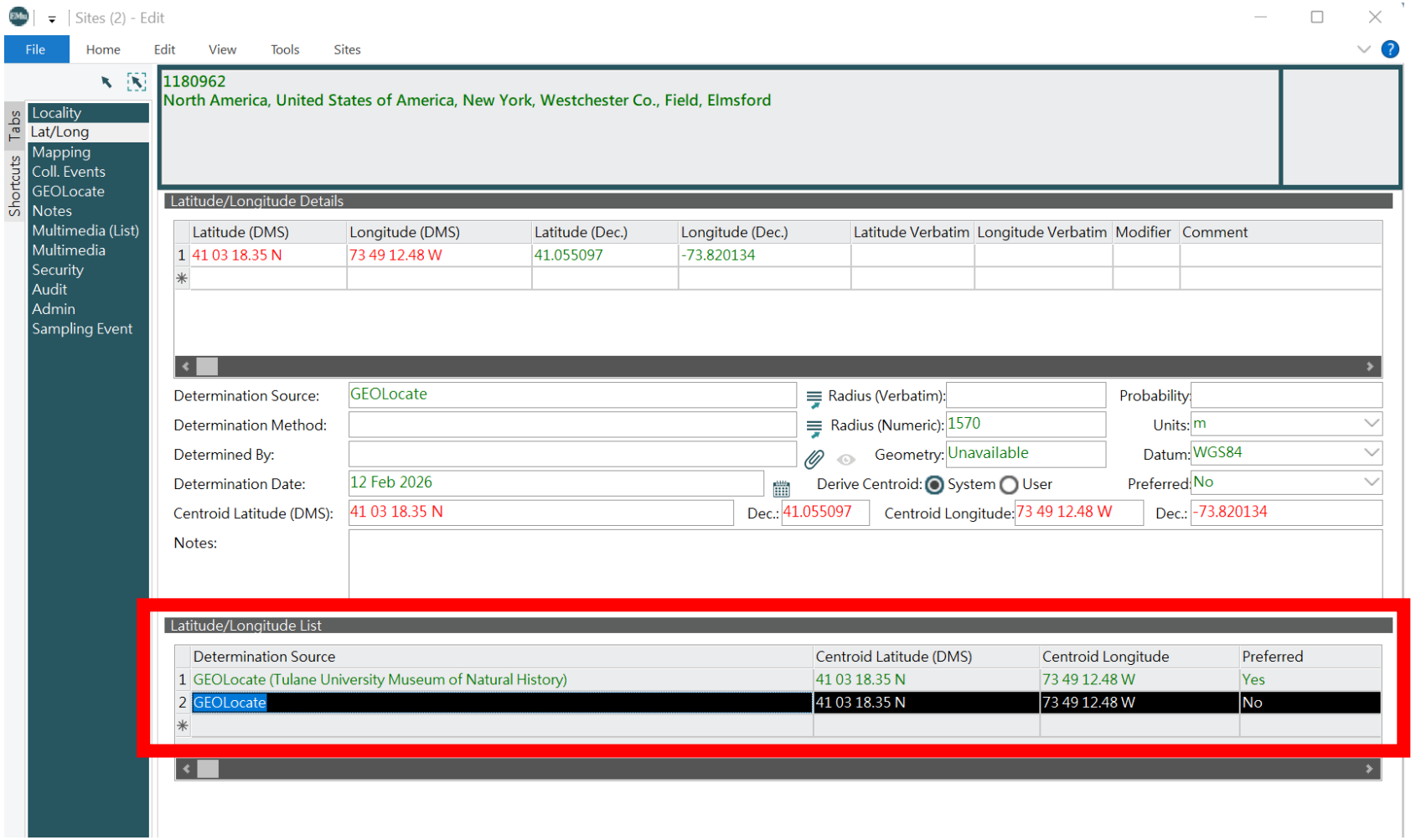
EMu Help: Sites Module

Saving: Record with Existing Georeference

New coordinates are saved as a new line in the *Lat/Long List* and default to Preferred: No.

To use them as the preferred coordinates:

- Move the record to line 1.
- Set Preferred: Yes.



Step by Step Instructions

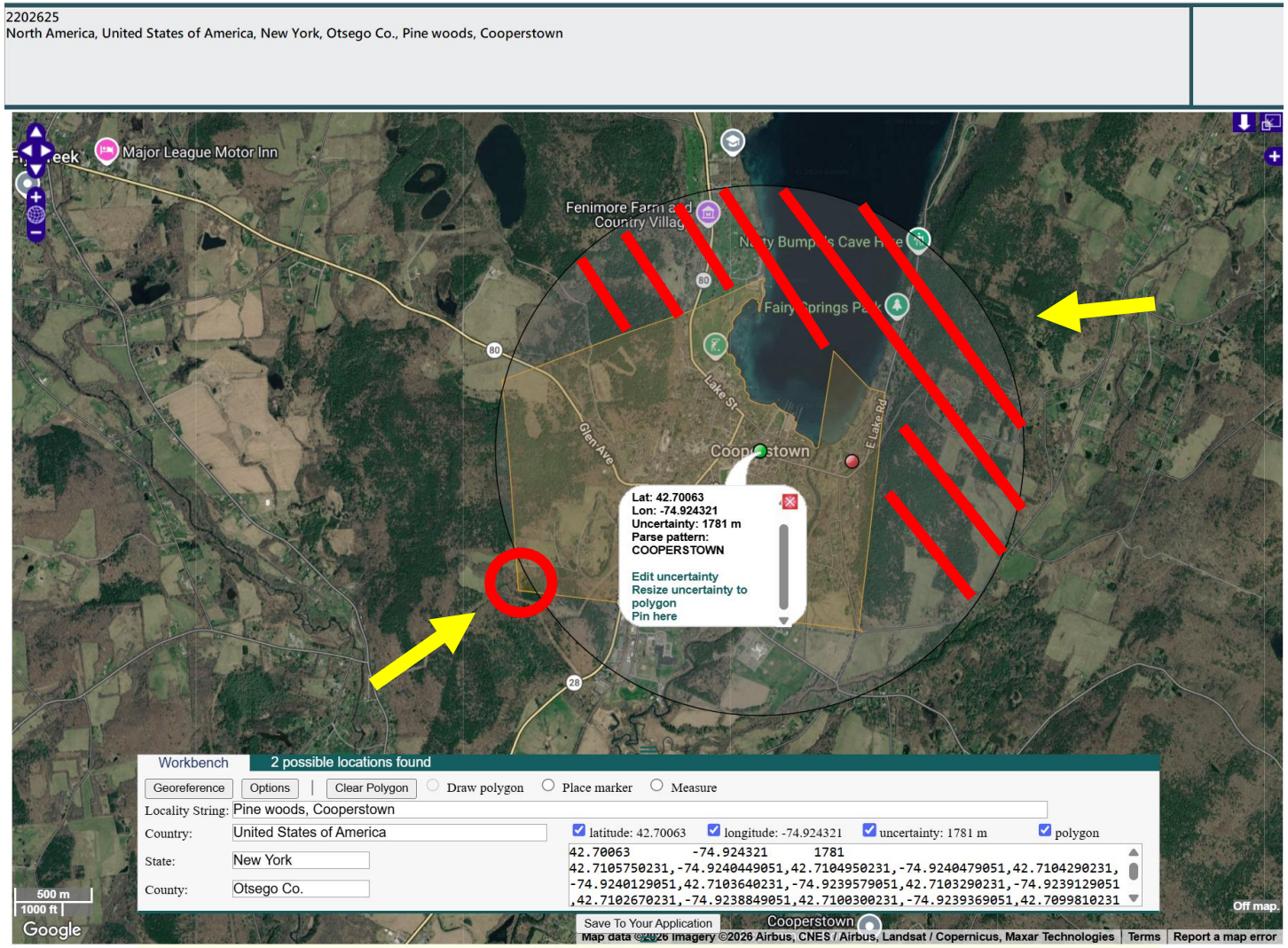
Using the GEOLocate Tab for Georeferencing

Step 1: Search

Initial search

- GEOLocate shows polygon
- Chosen point located in the downtown (versus geographic center)
- Circle does not encompass entire polygon

Cooperstown, Otsego Co., N.Y.



Step 2: Adjusting Coordinates

Coordinate adjustment

Manually shift chosen coordinates to more central location within the feature

Left click and drag green dot to desired location



Step 3: Adjust Uncertainty

<u>Uncertainty adjustment</u>

Select “Resize uncertainty to polygon”

If needed, fine-tune the point location within the polygon and re-adjust radius.



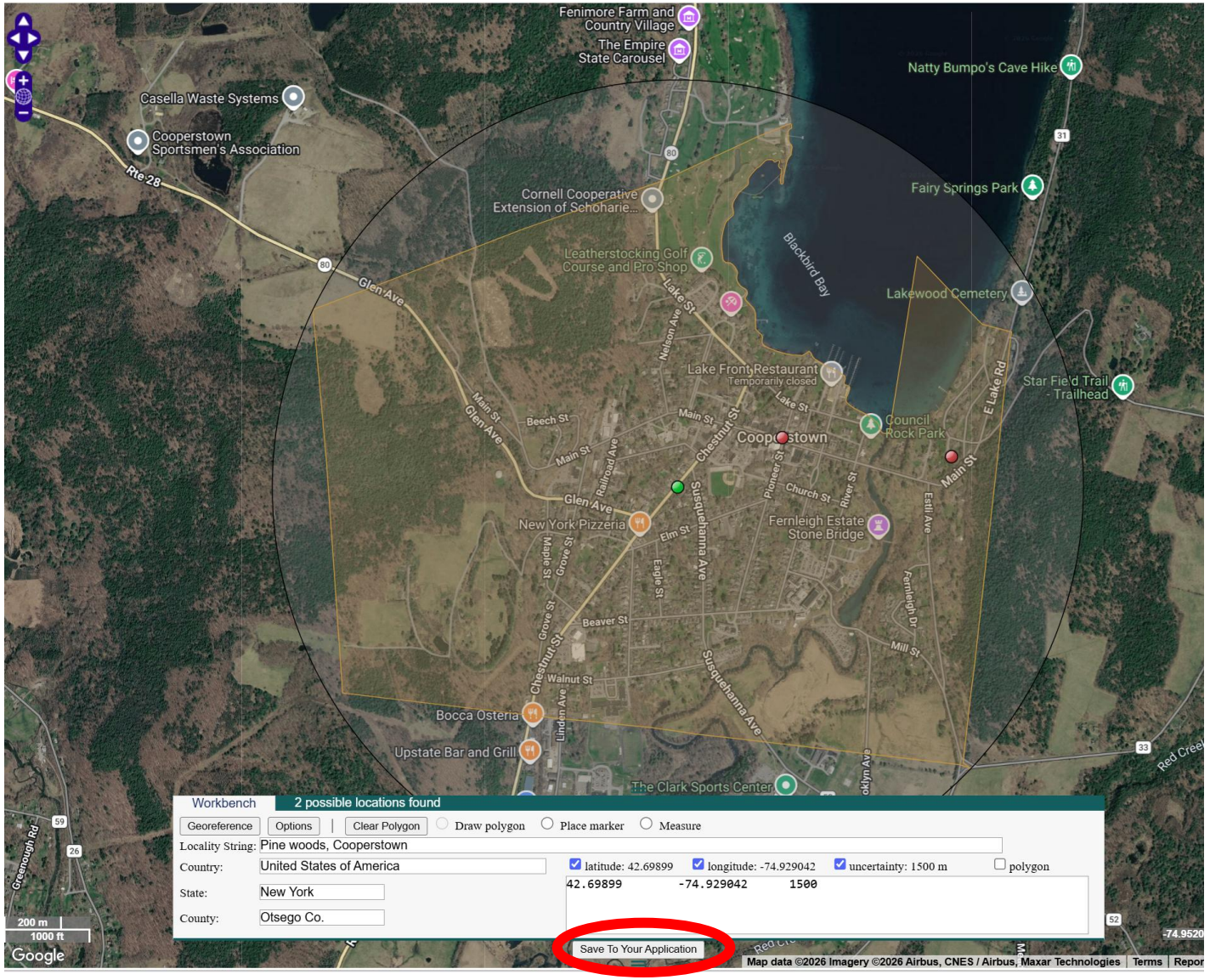
Adjust Uncertainty (Manual)

Select “Edit uncertainty” and manually adjust the radius until the desired circle size appears



Step 4: Save to My Application

Once satisfied with the coordinates and uncertainty value, click **"Save to Your Application"**



Metadata: Auto-populated Fields

Latitude (Dec.); Longitude (Dec.)

Det. Source: GEOLocate

Det. Date: date of georeference

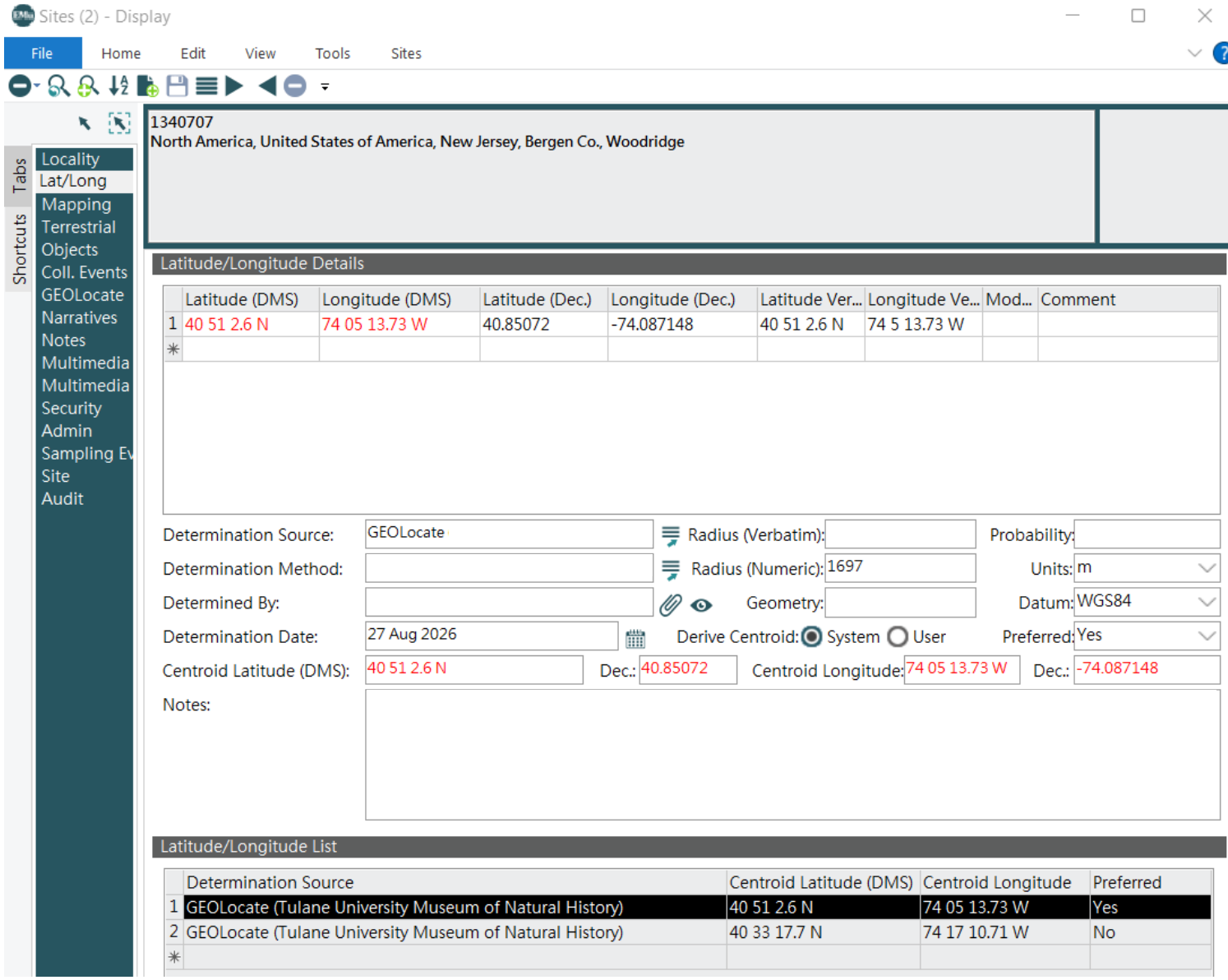
Radius: Calculated uncertainty

Units: Meters (m)

Datum: WGS84

Preferred: Set automatically based on existing georeferences

Geometry: Delete values

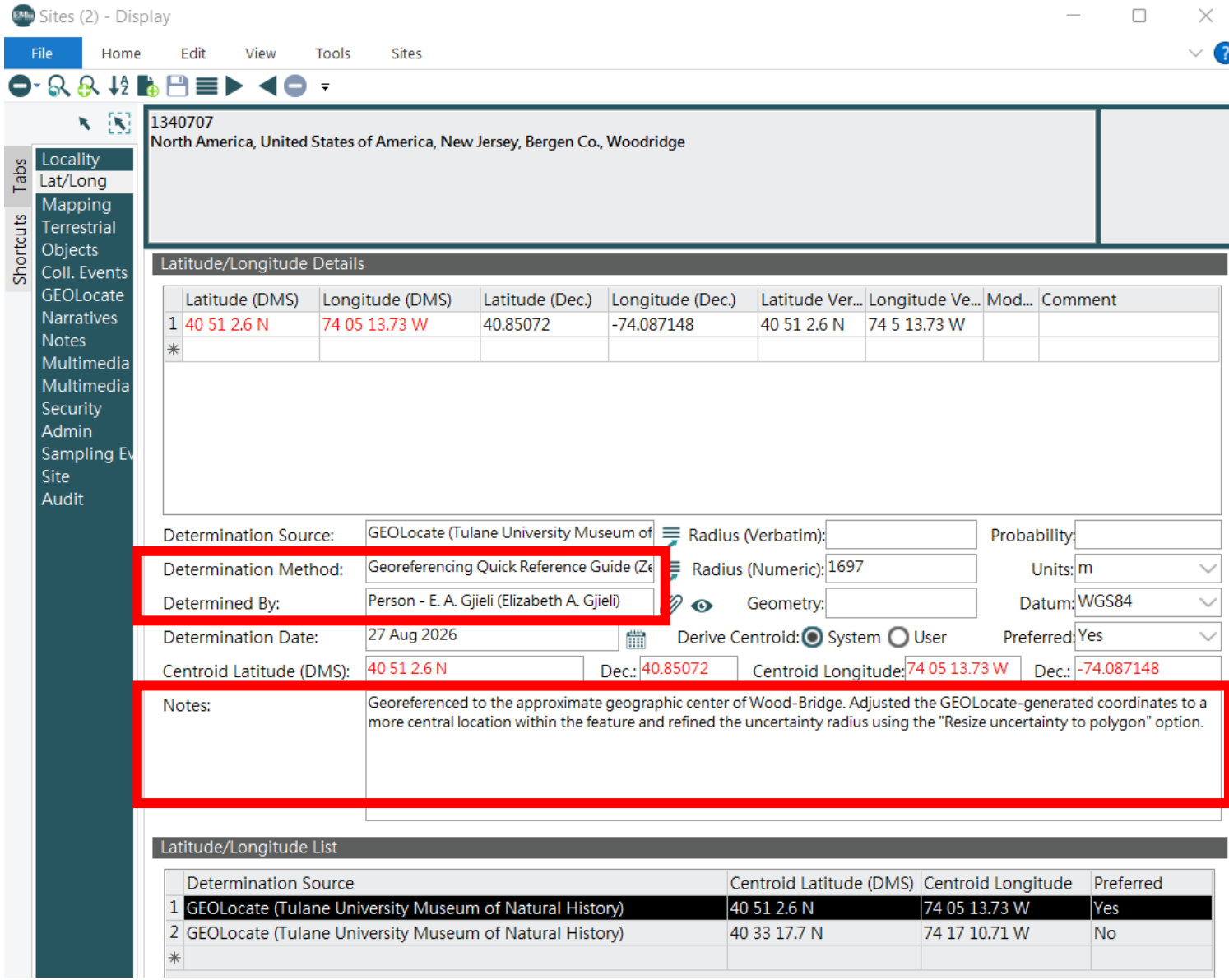


Metadata: Manually Add

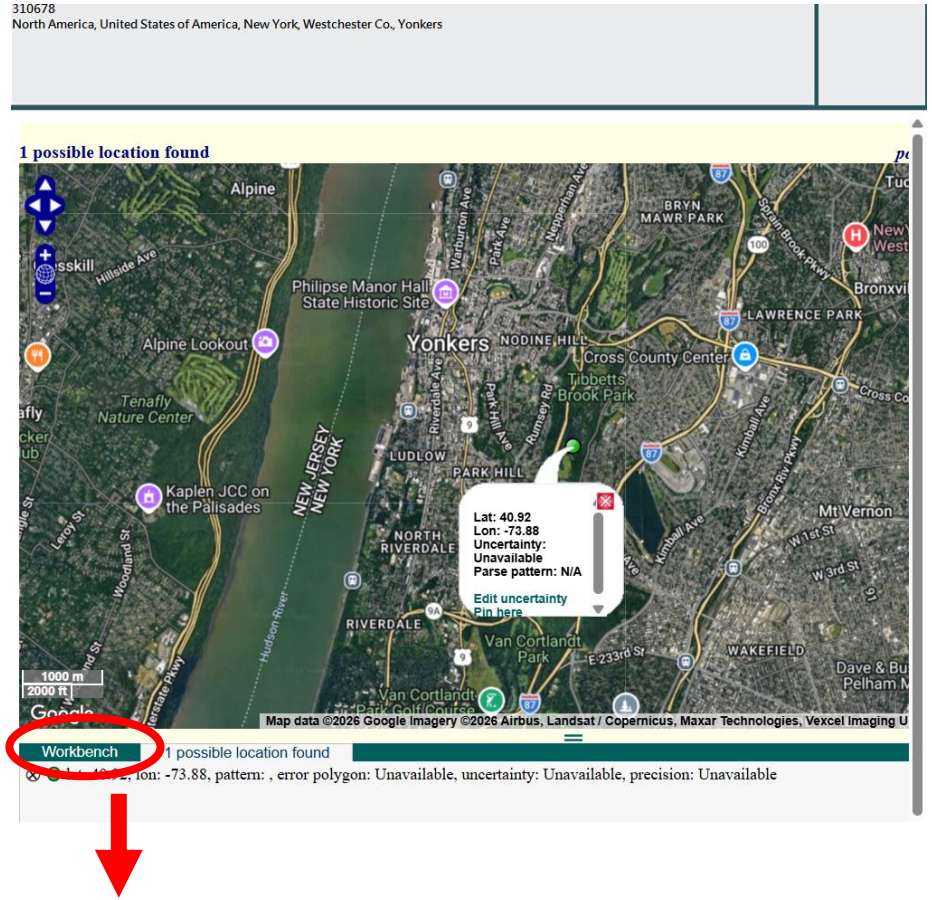
Det. Method: Georeferencing Quick Reference Guide (Zermoglio et al. 2020)

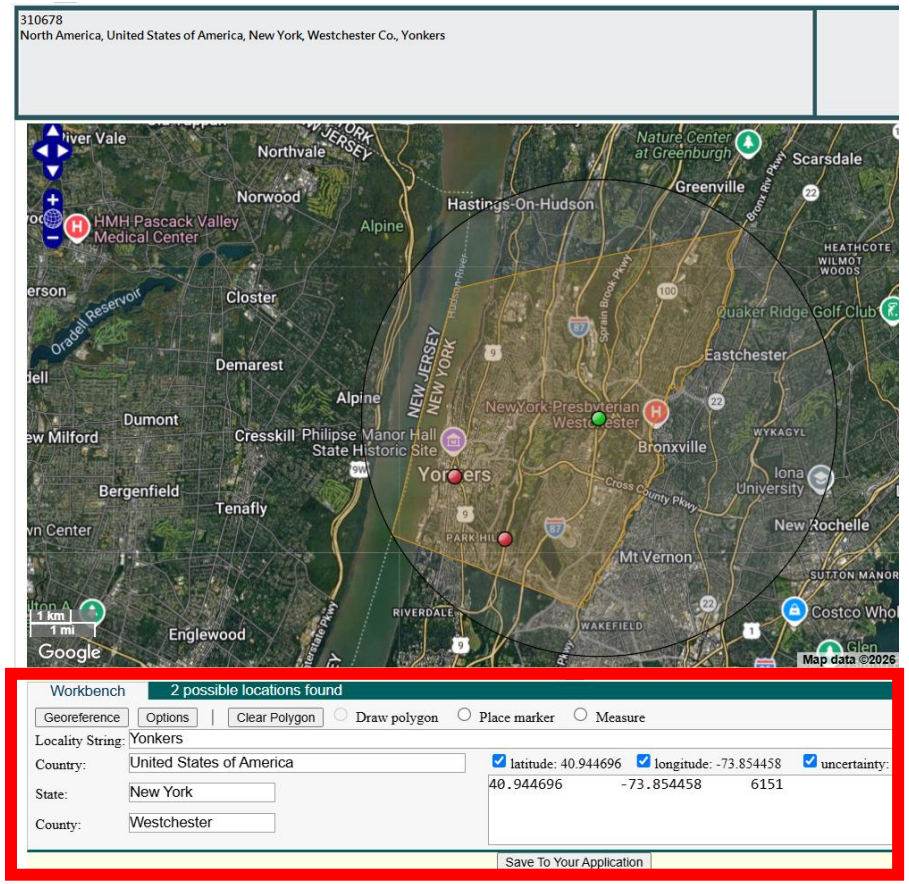
Det. By: Georeferencer's Parties record

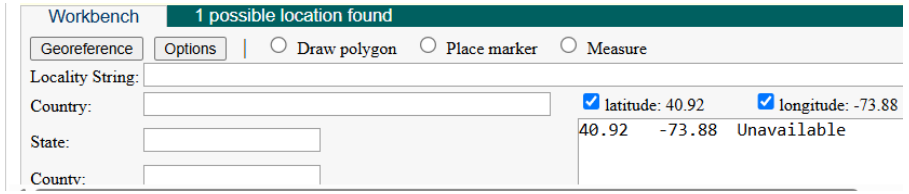
Notes: explanation of your georeferencing steps including any changes you made to the auto-generated coordinates and radius, or assumptions made.



Georeferencing Records with Existing Coordinates







- Existing coordinates and uncertainty are displayed by default
- GEOLocate does not display a new uncertainty radius or locality polygon when opening an already georeferenced record

Solution: Open Workbench, manually enter the locality details into the appropriate fields, and select Georeference.

GEOLocate can then use the entered locality information to locate the place, estimate an uncertainty radius, and display an available polygon.

Using GEOLocate Effectively

Strengths, Limitations, and Practical Examples

GEOLocate Strengths

- Visualizes the uncertainty on the map
- Provides polygons when available
- Georeferences named places with clear boundaries
- Handles distance-and-direction localities and offsets in two directions
- Recognizes common locality abbreviations (N, NE, S, St., Co., etc.)

GEOLocate Limitations

- Cannot interpret complex locality descriptions
- Cannot determine midpoints or positions along a linear feature
- Requires review when multiple location matches are found
- Unable to locate features outside of the U.S., Canada, and Europe (yet)

To GEOLocate or Not?

Yonkers, Westchester Co., New York, USA

10 km S of Lages along Highway BR-116 to Porto Alegre, Santa Catarina, Brazil

To GEOLocate or Not?

Use

Yonkers, Westchester Co., New York, U.S.

- Simple locality
- Located in U.S.
- Polygon available

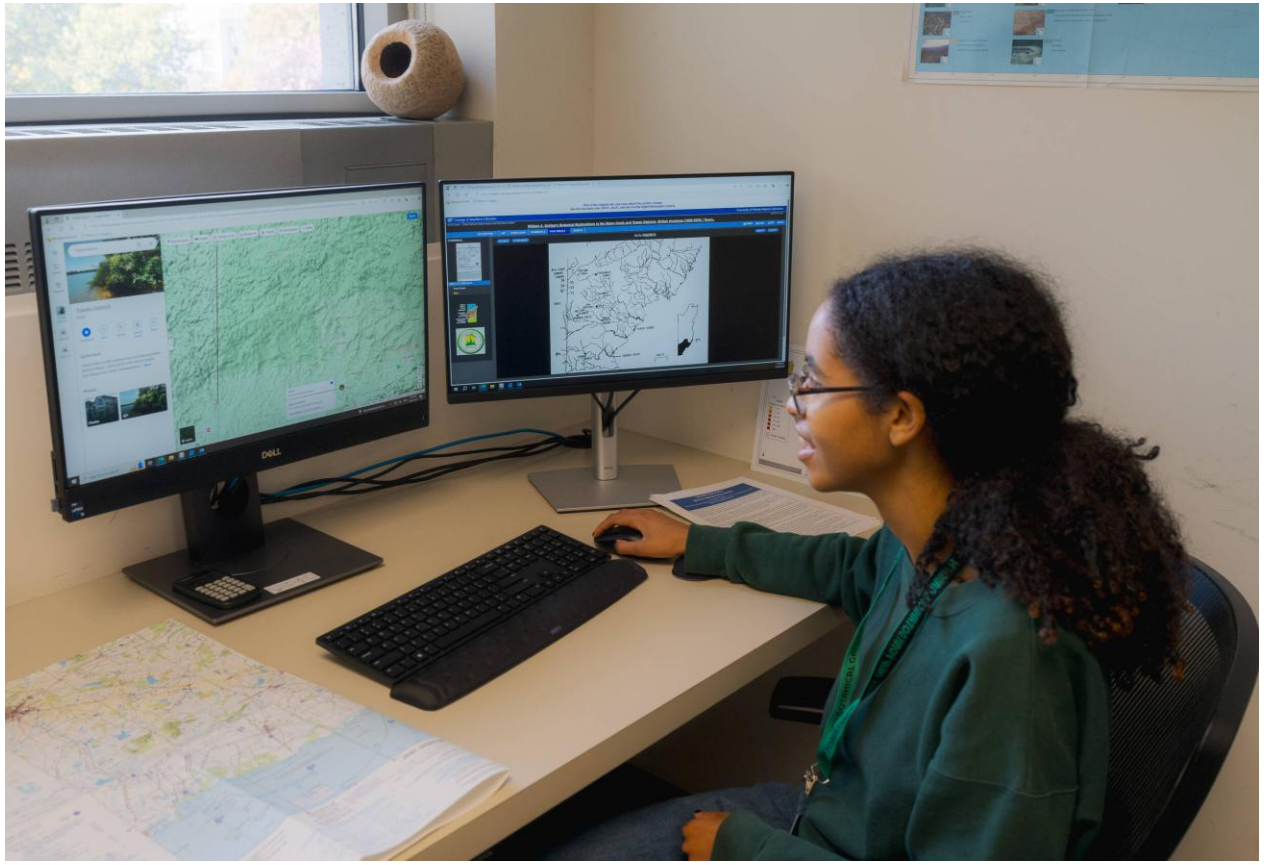
Don’t use

10 km S of Lages along Highway BR-116 to Porto Alegre, Santa Catarina, Brazil

- Complicated locality
- Not located in U.S., Canada, or Europe

Best Practices Guides and Tools

- Georeferencing Quick Reference Guide (2020)
- Best Practices Guide (2020)
- GEOLocate



Demo Examples

IRN: 1826736

North America, United States of America, New York, Schenectady Co., Duanesburg

IRN: 2559402

North America, United States of America, New York, Westchester Co., New Rochelle

IRN: 2560206

North America, United States of America, New York, Suffolk Co., Montauk, L.I.