


Revised June 16, 2015

Using GeoLocate Within Symbiota to Georeference Specimens in the MSU Herbarium

1. Only records with complete location information can be georeferenced. It is easiest to georeferenced records from a common location (e.g., county) at the same time. Under the Data Editor Control Panel, click on *Batch Georeference Specimens*.
2. Within the form, click on the country, state, and county you wish to work on. Then, click generate list. This should bring up all of the records in the database collected from that county.
3. In the list of records, it shows the specific location information and the number of records containing that information in brackets.
4. Click on the record you want to work on. Then, click on the  icon above the text box on the right side. This will open a new Geolocate window showing a map of the projected point.
5. Under Georeferencing options, make sure the uncertainty box is checked. Close the options window and click the Georeference button.
6. The tab directly under the map will have two options: Workbench and # of possible locations. On the map you may see one green and several red dots. The green dot is the best guess from GeoLocate and the red dots are alternatives.
7. In the # of possible locations tab you will see a description of each of the dots on the map. You have to decide which one best matches the locality description. Delete the others. The words in CAPS are the words GeoLocate used to find the location represented by the dot on the map. The circle around the dot is the uncertainty (determined by the point radius method as the default in GeoLocate).
8. After you have gone through all possible points, delete the options that are not correct. You should have only one location per record. **Make sure the location being detected matches what is in the locality string.**
9. It is possible that none of the dots will be correct. In this case, you have to do some more searching and figure out the best location yourself. This may require searching other references for place names. Errors in the records can create problems, so first look to make sure the location identified by GeoLocate matches the state and county in the locality description for the record. You can physically move the dot on the map (or use the Place Marker button on the Workbench tab) to the location you believe is correct based on the locality string and habitat descriptions. Make sure you have deleted all of the options GeoLocate found first. This should only be done after you decided that GeoLocate is not working for a record.
10. If no coordinates are returned by GeoLocate (e.g., due to lack of locality string), then you can either choose to not georeference the record or assign the coordinates based on where you think the specimen was collected. Use the Place Marker button on the Workbench tab to add in a point. If you choose not to georeference the record, then note this in the Remarks box on the main georeferenced page so it doesn't appear as a missed record.
11. Next, you need to edit the uncertainty. The amount of uncertainty you assign a point is highly subjective, but you want it to be as accurate as possible. Using error polygons can be very helpful if you have sufficient locale information to generate a polygon. Only manually assign an error polygon if the locality description provides parameters that allow for this; e.g., with a description of "at the intersection of Hwy

Revised June 16, 2015

55 and County Road 109”, you should be able to draw a polygon of this intersection. When in doubt, ask Dr. Wallace.

12. To edit the uncertainty, click on the dot on the map. This will bring up a window of the coordinates and the uncertainty. Click on the live “edit uncertainty” text. Move the arrow smaller or larger to edit the uncertainty of the point. You may need to zoom in on the map to determine the best level of uncertainty. If you want to draw a polygon around the point, then click on the “Draw Polygon” button on the Workbench tab. Draw the polygon around the point on the map. Click on the dot again and then click “resize uncertainty to polygon”. This will draw a circle around the dot that matches the maximum extent of the polygon. The point radius method of uncertainty is still used. Note: if you only have a county as a locality for the specimen, then put the dot in the middle of the county and make the uncertainty the entire extent of the county (since there are polygons for most counties already, GeoLocate will most likely use these to estimate uncertainty. If there are polygons that are used by GeoLocate, then you will see them outlined on the map.
13. Once you are satisfied with the coordinates and the uncertainty, click Save to Your Application. This should close the GeoLocate window and return you to the Symbiota window. The coordinates and uncertainty should be in the fields now. Fill in the datum window with WGS84 since this is what is used by GeoLocate. Finalize the record by clicking on Update Coordinates. This should remove the record from the text box.
14. Go to the next record and repeat steps 4-13 until you have georeferenced and edited all records in your data set.

Important tips

1. Make sure the locality string and state/county match. Zoom in and out on the map to make sure the point returned by GeoLocate is in the state that is entered for the record. There may have been mistakes made in entering county or state information.
2. Often names of buildings and roads have changed or no longer exist if the record older (age>30 years)
 - a. Google it. Often you can find older accounts of where these locations once were
 - b. Try and find a map from when the collection was made
3. Local names may not be recognizable in GeoLocate
 - a. Google it.
4. Small roads are sometimes difficult to find
 - a. Use Google maps, bing maps, or even an atlas as an external source to find the road in question.
5. There are many different options for maps in GeoLocate. Explore the use of these if you are having trouble with a point.
6. If you think you have made a mistake, then stop and let Dr. Wallace know before proceeding.