



MAM GEOREFERENCING TRAINING



Morris Arboretum
UNIVERSITY of PENNSYLVANIA

Georeferencing
From a
Research Point
of View

Cindy Skema
Thurs 28 May 2020

PRACTICALITIES: GEOREFERENCING AS A RESEARCHER



- if you have collection permissions, georeference from within Symbiota, as shown already
- if you do not have collection permissions, you can work directly in [GeoLocate](https://www.geo-locate.org/web/WebGeoref.aspx), though other online resources could be useful
 - return lat/long results of your work to collections whenever possible to improve global database
- CoGe (Collaborative Georeferencing) – see [MAM Georeferencing Guidelines](https://908f66e9-10c3-420c-8391-c1c06080c872.filesusr.com/ugd/6f7156_4679ee3db0e341929eaddaec4ea147c2.pdf)

GEOREFERENCING GOALS DIFFER



- different players (collections managers, curators, researchers) may have different aims in georeferencing:
 - “poor” points to a researcher may be good enough from a collections point of view
 - digitization expediency

THINKING ABOUT GEOREFERENCING FROM A RESEARCH PERSPECTIVE...

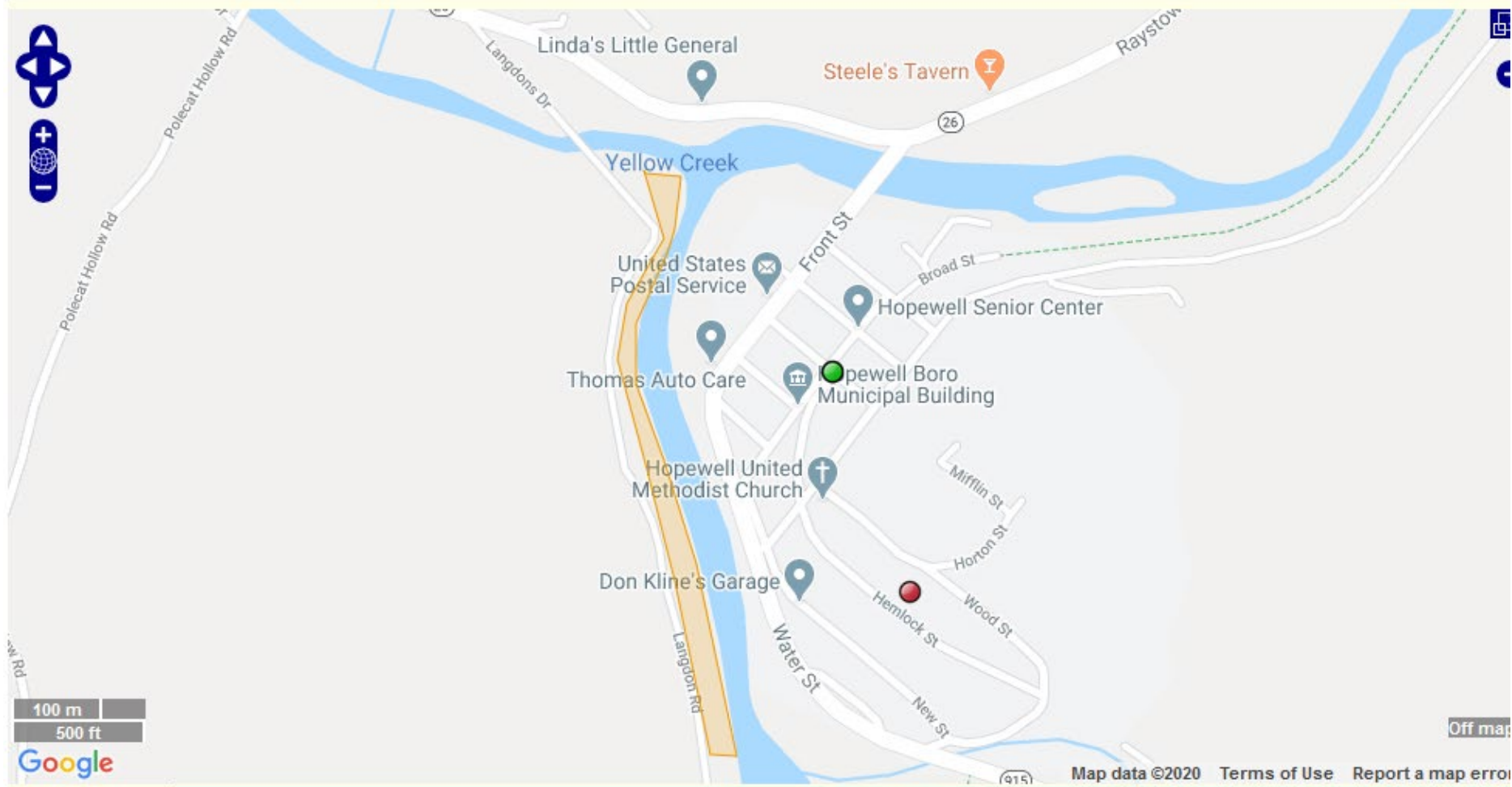


- [IDs – double check them yourself!]
- already georeferenced specimens – double check coordinates yourself!
- scale of data should match (or be greater than) the scale of georeferencing certainty

IT'S ALL ABOUT SCALE

*on west bank of Juniata River, south of mouth of Yellow Creek, west of Hopewell
Bedford County, PA*

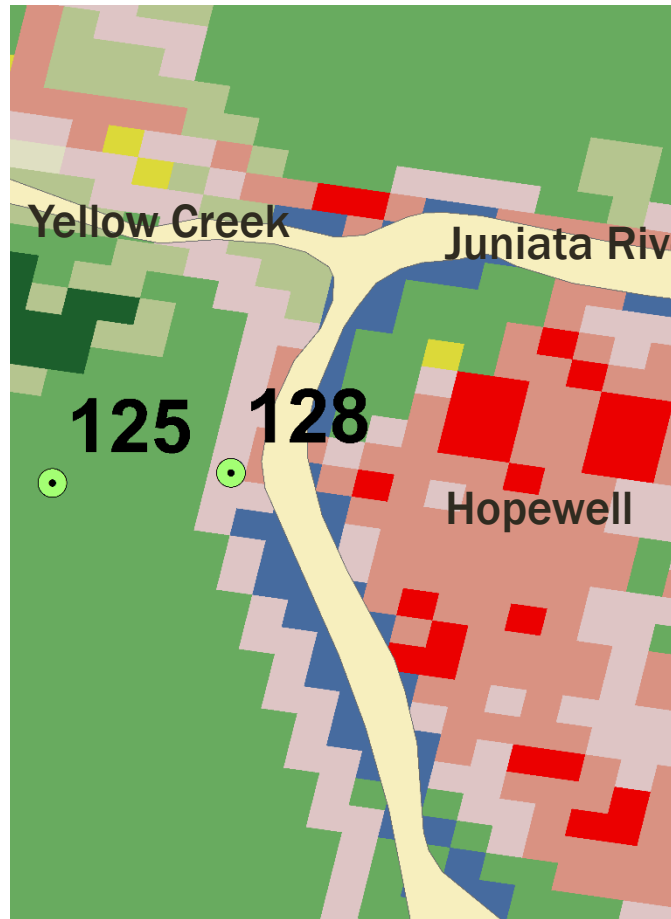
 GEOLocate Web Application



IT'S ALL ABOUT SCALE

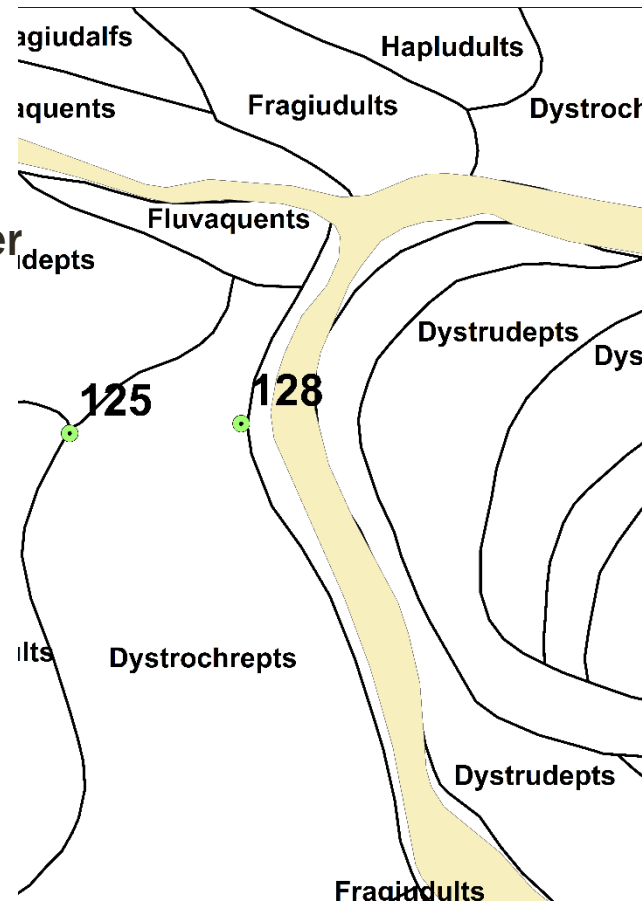
on west bank of Juniata River, south of mouth of Yellow Creek, west of Hopewell
Bedford County, PA

FINER



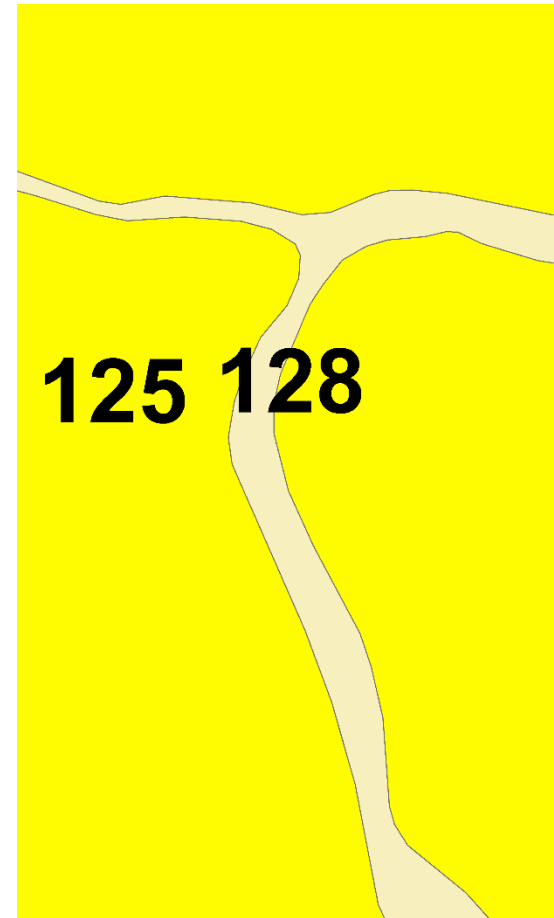
land use
(National Land Use Cover Dataset)

~EQUAL



soil
(Soil Survey Geographic Dataset=SSURGO)

GREATER



annual mean temperature
(BioClim)

THINKING ABOUT GEOREFERENCING FROM A RESEARCH PERSPECTIVE...



- [IDs – double check them yourself!]
 - already georeferenced specimens – double check coordinates yourself!
 - scale of data should match (or be greater than) the scale of georeferencing certainty
 - ranking georeferencing results:
 - Level 3: GPS – “gold standard”
 - Level 2: georeferenced from precise locality statement
 - Level 1: georeferenced from general locality statement
 - [Level 0: not able to be georeferenced, or cultivated]
- ... then run analyses on Level 3 vs. Level 3+2 vs. Level 3+2+1, to see how georeferencing itself has affected your analyses

FUTURE DIRECTIONS



- county mean/median for climate were significantly better fits for approximating climate of specimen records than climate of geographical centroid of county

Journal of Biogeography (J. Biogeogr.) (2017) **44**, 2188–2198

**METHODOLOGICAL
APPLICATIONS**



Implications and alternatives of assigning climate data to geographical centroids

Daniel S. Park*  and Charles C. Davis

- potential use of averaging across polygons for less precise localities? (quantitative data)

CLEAN YOUR DATA!



Journal of Biogeography (J. Biogeogr.) (2010) **37**, 733–740



**ORIGINAL
ARTICLE**



Modelling the responses of Andean and Amazonian plant species to climate change: the effects of georeferencing errors and the importance of data filtering

Kenneth J. Feeley^{1,2*} and Miles R. Silman^{1*}

Received: 23 June 2017 | Revised: 31 August 2017 | Accepted: 2 September 2017

DOI: 10.1002/ece3.3516

ORIGINAL RESEARCH

WILEY Ecology and Evolution Open Access

Why georeferencing matters: Introducing a practical protocol to prepare species occurrence records for spatial analysis

Trevor D. S. Bloom¹  | Aquila Flower² | Eric G. DeChaine¹

FOLLOW UP Q&A SESSION



- Go do some georeferencing and come back with questions:
 - 10 am on Monday 8 June 2020
 - zoom invitation to follow
- recordings of both meetings will be available online to refer back to or for further training
- Now to questions from today's session...