Identification of Mapped, Yet No Longer Existing Unincorporated Communities (Phantoms) In Wisconsin

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Geography 778, December 2022

Background:

When looking at Wisconsin on Google Maps, one will come across labels for unincorporated communities. Understandably, this gives the impression that there is a community at that location. However, upon further inspection (*i.e.*, zooming in on the map), there is little evidence of a veritable community at that location. For example, in a Google search for Clyde, WI, in Kewaunee County (Appendix, *Figure 1*), the resultant "Quick Facts" indicate it to be an unincorporated community, while other evidence (satellite imagery) indicates that there is no community at that location. These non-existent unincorporated communities exist on Google Maps because Google uses US Topo maps from the USGS as a main source of map data. The USGS, in turn, uses the Geographic Names Information System (GNIS, the federal and national standard for geographic nomenclature), as its source of geographic names, including unincorporated places.

Intention:

The Wisconsin State Cartographer's Office (SCO) has assembled a collection (~625) of what are currently (and questionably) recognized by the USGS in the GNIS as unincorporated communities in Wisconsin. It was the intent of this project to develop a mapping methodology that would identify those unincorporated communities in the collection that are no longer physically existing anywhere but on a map. To distinguish them from other communities, these members of the collection are identified as "Likely Phantom Communities." Once verified as "truly" Phantom, they can be presented to the USGS for appropriate re-symbolization or removal from US Topo maps.

Target Audience:

The target audience for this project is varied. The primary intended audience is professional cartographers, namely those at the Wisconsin State Cartographer's Office and the those at the USGS who oversee the GNIS. Once presented with a list of verified Phantoms, those two groups will be capable of initiating needed changes to official government maps. Because USGS Topo maps are used as primary map sources, the changes will be seen by end-users of online maps (e.g., Google Maps, Open Street Maps). The secondary intended audience for this project is interested members of the general public.

Deliverables:

The final product is a web-based, interactive map that allows the user to see the classification of a portion of the uninvestigated collection of communities mentioned

above, as determined by a novel mapping methodology. The map also includes unincorporated communities that were previously investigated by the State Cartographer's Office. By using different tools (currently in development) in the web-application, this interactive map will also allow for the user to assemble and export lists of unincorporated communities of interest, routes directing them there, and the opportunity to contribute to and see photos or stories from a crowd-sourced database.

Product Development & Delivery Overview:

Using ArcGIS Pro, a methodology was developed for identifying members of a "Likely Phantom Communities" feature class from the collection of ~625 uncategorized unincorporated communities. This feature class was converted into a GeoJSON and then mapped in the interactive web-application. More details of the workflow are below:

I. ArcGIS Pro Methodology
   a. Two feature classes were used as a starting point:

      i. A point layer of unclassified, unincorporated communities with the lat/lons that are on record with the GNIS.
      ii. The Wisconsin Statewide Parcel Map, as available through the WI State Cartographer's Office.

   b. A 0.25 mile buffer was created around the lat/lon as recorded by the GNIS for the ~625 locales. The chosen buffer distance was based on the criteria set by the WI Department of Transportation for the installation of an unincorporated community road sign. Among other guidelines, one criterion states that, "the community should have a reasonable permanent population (a minimum of 50 people) within a reasonable geographic proximity (1/4 miles in each direction of a common intersection or ½ mile in diameter)."

   c. Parcels were selected that were 1) in whole or in part, classified as residential (*i.e.*, could have been residential, residential and commercial, residential and agricultural, etc.); and 2) had an assessed value of improvements >$800. This value was based on the distribution of assessed value of improvements of parcels that included a residential classification.

   d. The intersection of the selected parcels and the buffer was determined.

   e. A spatial join was made with the buffered points and the resultant layer from the intersection above. The spatial join created a Join Count which reflects the number of parcels within the buffer that include a residential classification. The assumption was made that intersections with no residential parcels have no residential population (or existent community). Therefore, those records with a Join Count of zero have no residentially classified parcels and are considered to likely be Phantoms. (See Appendix, *Figure 2*).

II. Web-Application Development

a. An application was developed to display an interactive Wisconsin map with point data representing various categories of unincorporated communities.
     i. HTML, CSS, JavaScript (including Bootstrap and Leaflet) were used.
     ii. GeoJSON files were used in a JS format to facilitate mapping of all point data.
b. The application is currently hosted on a development server at SCO (dev.sco.wisc.edu/developers/mike/VeryEarlyStage_PhantomWebPage _V2) but will ultimately be hosted on my personal GitHub account (mhasinoff.github.io) and the SCO public website (maps.sco.wisc.edu).

Results:

Of the ~625 "Phantoms To Explore", the methodology identified 58 as "Likely Phantoms," seen as yellow dots in Appendix, *Figure 3*. Upon first investigation, this appears to be a worthwhile "first cut" for finding Phantoms within the ~625 unincorporated communities. (See example in Appendix, *Figure 4*).

Future Study:

As mentioned above, there are three other user features or tools that would enhance this project. The first would allow the user to easily compile a list of communities to investigate for themselves. It would be similar to this website, where you can get a list of locales within a selected radius. A second feature would allow the user to construct a tool similar to those used for fleet routing, where it would design an efficient route to visit several unincorporated communities in one trip. A third feature would be to incorporate a database in which users could query or add photos or stories for unincorporated communities by interacting with the web-application. These elements would be accessible through the pop-up windows for each locale.

Lastly, to help identify phantoms, other parameters were researched that did not restrict the methodology to only using parcels with no residential classifications. These other parameters included proximity to churches, cemeteries, and fire stations. Though it would be more time consuming, dasymetric mapping with building footprints and census block data also appears to be a promising method for identifying more phantoms from the list of ~625.

Resources:

- Communities in WI currently documented as unincorporated (https://maps.sco.wisc.edu/unincs/)
- WI Parcel Data (https://www.sco.wisc.edu/data/parcels/)

- Geographic Names Information System
  (https://edits.nationalmap.gov/apps/gazdomestic/public/search/names)
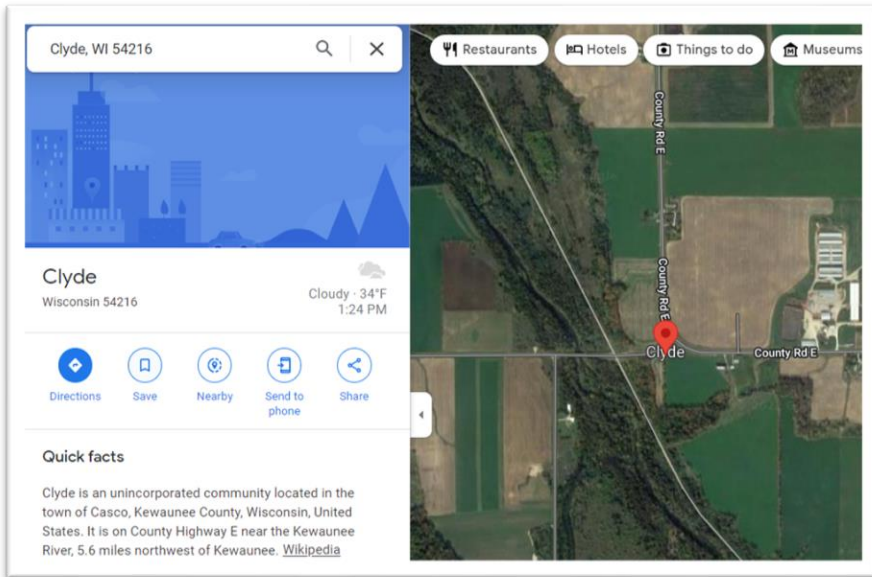
Appendix:

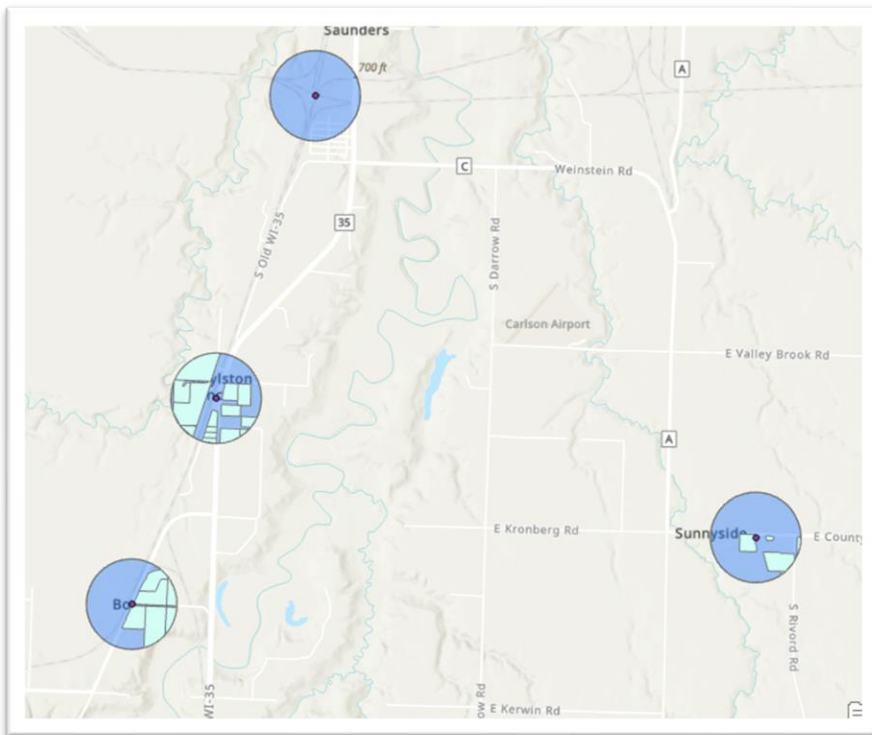*Figure 1.* Clyde, Kewaunee County, WI

Figure 2. Results after applying mapping methodology. The light green polygons represent residential parcels, therefore, using the applied methodology as described above, the three communities closest to the bottom of the map would not be considered phantoms, while the top community, Saunders, would.
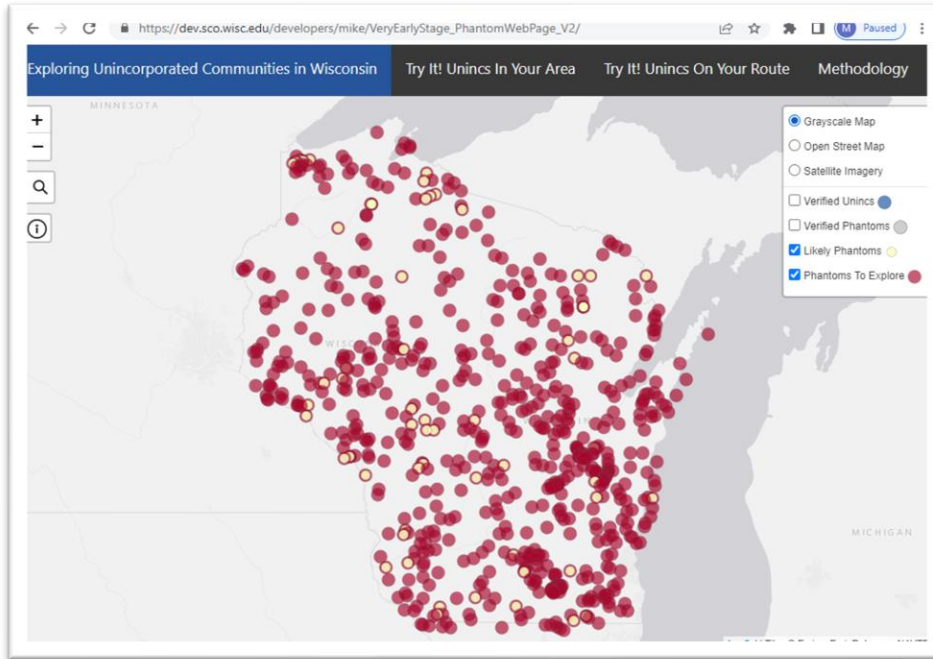
Figure 3. Methodology Results. Red dots represent the collection of the original ~625 possible phantoms that have not been previously investigated by SCO. Yellow dots directly overlay red dots and represent the results of the applied methodology: uninvestigated unincorporated communities that are likely to be phantoms.
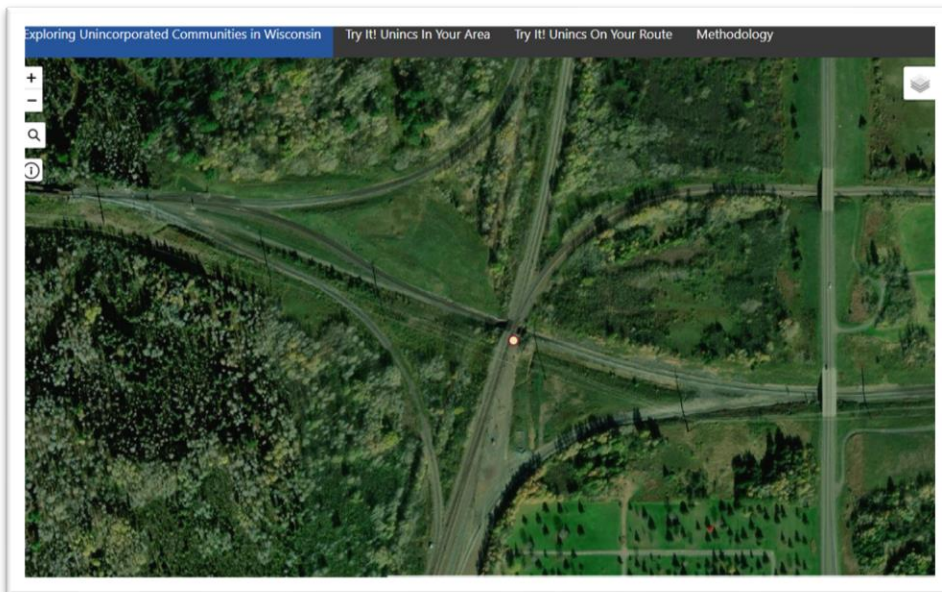

Figure 4. Example of Likely Phantom Community. In the center of the image above, a small yellow dot overlaying a red dot indicates that Saunders (a previously uninvestigated, unincorporated community as seen in *Figure 2*) is a "Likely Phantom."