31 October 2021

New York State Redistricting Commission

Dear Commissioners:

While there is a long history of gerrymandering, determining the geographic boundaries of government representation for the people of New York State, and the entire country, should be objective. Those boundaries should be drawn without knowledge of the political view, voting history, or social makeup of the people within those units. I offer an objective means of determining district boundaries using only New York’s natural geography and the number of people living in each location within the State, as reported by the census.

The hierarch of natural drainage units offers the appropriate framework, and historic human settlement was tied to rivers and lakes. New York State is naturally divided by watersheds and their subunits: Subwatersheds, Valley Segments, and local drainages to each stream reach within the drainage network. Each of these unit types represents progressively finer spatial units, nested within the larger units and are the building blocks for any kind of demographic district. There are specific definitions for each of these which are publically available and I’m happy to share those.

To generate district maps, I first determined the number of people living within the drainage area of each stream reach in the state. Then, using a few simple rules, I added spatial units together until ~710,000 people were included (in the case of US Congressional Districts). Very generally, the rules are, 1) begin at the mouth of each watershed that drains to a single point (at an ocean, Great Lake, great river, or State boundary) and add spatial units upstream until enough people are included to make a complete district, 2) if an entire watershed is insufficient, add an adjacent watershed, and 3) if the additional watershed is too large (i.e., too many people) then use the fewest necessary units from the adjacent headwater zones to complete the district.

I provide a map of US Congressional districts as an example of the results of the process, because they are the largest units and encompass the entire state. The process can be applied to district mapping at any scale (e.g., State legislature, county or town districts, etc.) and can be completely automated each time new census data are available. I have not had the time to develop the programming necessary for automation, but the automated process would result in a map very similar to the one I have submitted, in which the process was completed by hand using a geographic information system and publically available data, although, the “Lower Hudson” unit is presently too small. I did the best I could with New York City, but most of the stream network is buried under the streets and thus, a unit named “Brooklyn” (which includes Brooklyn and Queens) must still be divided into three districts and the “Flatbush” district must be internally reapportioned into two units. A historic stream network could probably be located so that the process could be applied effectively within the City. Also, my watershed coverage did not include Staten Island, which would constitute another district, in combined with an adjacent area of New York City (e.g., part of the Brooklyn unit).

In the US Congressional districts example, I have simply applied names that I thought were most descriptive. However, the districts may be numbered or named in any appropriate way and translation from present districts to those proposed would be fairly straightforward for many.

The most important point here is to use the objective process. I appreciate the commission’s consideration of this approach and am happy to better explain the process details.

Sincerely,

James E. McKenna, Jr. Ph.D.