Ballas et al. (2018)

Ballas and colleagues explain that spatial data and GIS offer an important way to understand social phenomena by connecting human behavior, demographic patterns, and the places where these patterns occur. The authors show that maps, spatial statistics, and geographic visualization help researchers interpret inequalities, population changes, environmental conditions, and the effects of public policies. Their work demonstrates that spatial thinking is essential in the social sciences because many social processes take place within specific geographic contexts.

Parker and Asencio (2009)

Parker and Asencio focus on the practical use of GIS and spatial analysis in social science research. They explain how to prepare geographic data, create maps, and use spatial models to study issues such as crime, neighborhood effects, and social interactions. The authors show that applying spatial tools improves the accuracy and clarity of social research because these methods reveal patterns that are not visible when using only traditional analytical approaches.

Class Discussion

Geocodes

Geocodes are standardized location identifiers—such as latitude and longitude coordinates, street addresses, ZIP codes, census tracts, or grid references—that allow data to be tied to a specific point or area on the Earth's surface. They serve as the fundamental link between raw data and geographic space, enabling researchers to merge datasets, map observations, and analyze social, economic, or environmental patterns across locations.

Interactive maps

Interactive maps are digital maps that let users engage directly with spatial information by zooming, panning, clicking on features, filtering layers, or adjusting the map display. Unlike static maps, interactive maps support exploration and inquiry, making it easier to detect spatial patterns,

compare regions, and understand relationships in the data. They are commonly used in dashboards, web mapping applications, and tools like ArcGIS Online, Leaflet, and Google Maps.

Location services

Location services refer to the technologies and systems (GPS satellites, cell towers, Wi-Fi networks, Bluetooth beacons, and device sensors) that determine the geographic position of a phone, computer, vehicle, or sensor device. These services enable navigation apps, geotagged photos, ride-sharing platforms, delivery tracking, and emergency response systems. In research, location services make it possible to collect real-time movement data, monitor environmental conditions, and support spatial surveys.

Spatial modeling

Spatial modeling uses statistical, mathematical, or computational methods to analyze how geographic factors shape social or environmental outcomes. It includes techniques such as spatial regression, spatial autocorrelation, hotspot detection, spatial interpolation, and agent-based modeling. Spatial models help researchers understand how location influences behavior, identify clusters or trends, predict future patterns, and evaluate the impact of policy or environmental changes across space.