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اعداد م.م. عمارحسين

GEOGRAPHICS TECHNIQUES AND TERMS

Techniques

As spatial interrelationships are key to this synoptic science, maps are a key tool. Classical cartography has been joined by a more modern approach to geographical analysis, computer-based geographic information systems (GIS).

In their study, geographers use four interrelated approaches:
Systematic — Groups geographical knowledge into categories that can be explored globally.
Regional — Examines systematic relationships between categories for a specific region or location on the planet.
Descriptive — simply specifies the locations of features and populations.
Analytical — Asks why we find features and populations in a specific geographic area.

Cartography

Cartography studies the representation of the Earth's surface with abstract symbols (map making). Although other subdisciplines of geography rely on maps for presenting their analyses, the actual making of maps is abstract enough to be regarded separately. Cartography has grown from a collection of drafting techniques into an actual science.

Geographic information system

Geographic information systems (GIS) deal with the storage of information about the Earth for automatic retrieval by a computer, in an accurate manner appropriate to the information's purpose. In addition to all of the other subdisciplines of geography, GIS specialists must understand computer science and database systems. GIS has revolutionized the field of cartography; nearly all mapmaking is now done with the assistance of some form of GIS software. GIS also refers to the science of using GIS software and GIS techniques to represent, analyze and predict spatial relationships. In this context, GIS stands for Geographic Information Science.

Remote sensing

Remote sensing is the science of obtaining information about Earth features from measurements made at a distance. Remotely sensed data comes in many forms such as satellite imagery, aerial photography and data obtained from hand-held sensors. Geographers increasingly use remotely sensed data to obtain information about the Earth's land surface, ocean and atmosphere because it: a) supplies objective information at a variety of spatial scales (local to global), b) provides a synoptic view of the area of interest, c) allows access to distant and/or inaccessible sites, d) provides spectral information outside the visible portion of the electromagnetic spectrum, and e) facilitates studies of how features/areas change over time. Remotely sensed data may be analyzed either independently of, or in conjunction with, other digital data layers (e.g., in a Geographic Information System).

Quantitative methods

Geostatistics

Geostatistics deal with quantitative data analysis, specifically the application of statistical methodology to the exploration of geographic phenomena. Geostatistics is used extensively in a variety of fields including: hydrology, geology, petroleum exploration, weather analysis, urban planning, logistics, and epidemiology. The mathematical basis for geostatistics derives from cluster analysis, linear discriminant analysis and non-parametric statistical tests, and a variety of other subjects. Applications of geostatistics rely heavily on geographic information systems, particularly for the interpolation (estimate) of unmeasured points. Geographers are making notable contributions to the method of quantitative techniques.

Qualitative methods

Ethnography

Geographic qualitative methods, or ethnographical; research techniques, are used by human geographers. In cultural geography there is a tradition of employing qualitative research techniques also used in anthropology and sociology. Participant observation and in-depth interviews provide human geographers with qualitative data.

OTHER TERMS

Location

Location (geography), one of the five geographic themes, and a specific position or point in physical space

Absolute location, describing a position on the surface of the Earth
Location-allocation, used in geographic information systems (GIS) .

The terms location and place in geography are used to identify a point or an area on the Earth's surface or elsewhere. The term 'location' generally implies a higher degree of certainty than "place" which often has an ambiguous boundary relying more on human/social attributes of place identity and sense of place than on geometry.

Types of location/place

An absolute location is designated using a specific pairing of latitude and longitude, a Cartesian coordinate grid (e.g.,a Spherical coordinate system), an ellipsoid-based system (e.g., World Geodetic System), or similar methods.
A relative location is described as a displacement from "another site, i.e. "3 miles northwest of Seattle".
A place, such as a settlement or suburb is likely to have a well-defined name but have a boundary which is less well defined and which varies by context. London has a legal boundary, but this is unlikely to completely match with general usage. Areas within a town, such as Covent Garden in London again has some ambiguity as to its extent.

Area is a quantity that expresses the extent of a two-dimensional surface or shape in the plane. Area can be understood as the amount of material with a given thickness that would be necessary to fashion a model of the shape, or the amount of paint necessary to cover the surface with a single coat. It is the two-dimensional analog of the length of a curve (a one-dimensional concept) or the volume of a solid (a three-dimensional concept).

The area of a shape can be measured by comparing the shape to squares of a fixed size. In the International System of Units (SI), the standard unit of area is the square metre (m2), which is the area of a square whose sides are one metre long. A shape with an area of three square metres would have the same area as three such squares. In mathematics, the unit square is defined to have area one, and the area of any other shape or surface is a dimensionless real number.

Vegetation is a general term for the plant life of a region; it refers to the ground cover provided by plants. It is a general term, without specific reference to particular taxa, life forms, structure, spatial extent, or any other specific botanical or geographic characteristics. It is broader than the term flora which refers exclusively to species composition. Perhaps the closest synonym is plant community, but vegetation can, and often does, refer to a wider range of spatial scales than that term does, including scales as large as the global. Primeval redwood forests, coastal mangrove stands, sphagnum bogs, desert soil crusts, roadside weed patches, wheat fields, cultivated gardens and lawns; all are encompassed by the term vegetation.

A census is the procedure of systematically acquiring and recording information about the members of a given population. It is a regularly occurring and official count of a particular population. The term is used mostly in connection with national population and housing censuses; other common censuses include agriculture, business, and traffic censuses. In the latter cases the elements of the 'population' are farms, businesses, and so forth, rather than people. The United Nations defines the essential features of population and housing censuses as "individual

enumeration, universality within a defined territory, simultaneity and defined periodicity", and recommends that population censuses be taken at least every 10 years. The term itself comes from Latin: during the Roman Republic the census was a list that kept track of all adult males fit for military service.

The census can be contrasted with sampling in which information is obtained only from a subset of a population, sometimes as an Intercensal estimate. Census data is commonly used for research, business marketing, and planning, as well as a baseline for sampling surveys. In some countries, census data are used to apportion electoral representation (sometimes controversially – e.g., Utah v. Evans).