

# Glossary

## A

**absolute direction** Direction with respect to cardinal east, west, north, and south reference points.

**absolute distance** The shortest-path separation between two places measured on a standard unit of length (miles or kilometers usually); also called real distance.

**absolute location** (*syn.*: mathematical location) The exact position of an object or a place stated in spatial coordinates of a grid system designed for locational purposes. In geography, the reference system is the global grid of parallels of latitude north or south of the equator and of meridians of longitude east or west of a prime meridian.

**accelerated eutrophication** The overnourishment of a water body with nutrients stemming from human activities such as agriculture, industry, and urbanization.

**accessibility** The relative ease with which a destination may be reached from other locations; the relative opportunity for spatial interaction. May be measured in geometric, social, or economic terms.

**acculturation** The cultural modification or change resulting from one culture group or individual adopting traits of a more advanced or dominant society; cultural development through “borrowing.”

**acid rain** Precipitation that is unusually acidic; created when oxides of sulfur and nitrogen change chemically as they dissolve in water vapor in the atmosphere and return to Earth as acidic rain, snow, fog, or dry particles.

**activity space** The area within which people move freely on their rounds of regular activity.

**adaptation** A presumed modification of heritable traits through response to environmental stimuli.

**agglomeration** The spatial grouping of people or activities for mutual benefit.

**agglomeration economies** (*syn.*: external economies) The savings to an individual enterprise that result from spatial association with other, similar economic activities.

**agricultural density** The number of rural residents per unit of agriculturally productive land. The measure excludes a region’s urban population and its nonarable land from the density calculation.

**agriculture** Cultivating the soil, producing crops, and raising livestock; farming.

**air mass** A large body of air with little horizontal variation in temperature, pressure, and humidity.

**air pressure** The weight of the atmosphere as measured at a point on the earth’s surface.

**alluvial fan** A fan-shaped accumulation of alluvium deposited by a stream at the base of a hill or mountain.

**alluvium** The sediment carried by a stream and deposited in a floodplain or delta.

**amalgamation theory** In human geography, the concept that multiethnic societies become a merger of the culture traits of their member groups.

**anaerobic digestion** The process by which organic waste is decomposed in an oxygen-free environment to produce methane gas (biogas).

**anecumene** *See* nonecumene.

**animism** A belief that natural objects may be the abode of dead people, spirits, or gods who occasionally give the objects the appearance of life.

**antecedent boundary** A boundary line established before the area in question is well populated.

**aquaculture** Producing and harvesting of fish and shellfish in freshwater ponds, lakes, and canals or in fenced-off coastal bays and estuaries; fish farming.

**aquifer** Underground porous and permeable rock that is capable of holding groundwater, especially rock that supplies economically significant quantities of water to wells and springs.

**arable land** Land that is or can be cultivated.

**Arctic haze** Air pollution resulting from the transport by air currents of combustion-based pollutants to the area north of the Arctic Circle.

**area analysis tradition** One of the four traditions of geography, that of regional geography.

**area cartogram** A type of map in which the areas of the units are proportional to the data they represent; value-by-area map.

**arithmetic density** *See* crude density.

**arroyo** A steep-sided, flat-bottomed gully, usually dry, carved out of desert land by rapidly flowing water.

**artifacts** The material manifestations of culture, including tools, housing, systems of land use, clothing, and the like. Elements in the technological subsystem of culture.

**artificial boundary** *See* geometric boundary.

**assimilation** The social process of merging into a composite culture, losing separate ethnic or social identity and becoming culturally homogenized.

**asthenosphere** A partially molten, plastic layer above the core and lower mantle of the earth.

**atmosphere** The gaseous mass surrounding the earth.

**atoll** A near-circular low coral reef formed in shallow water enclosing a central lagoon; most common in the central and western Pacific Ocean.

**azimuthal projection** *See* planar projection.

## B

**barchan** A crescent-shaped sand dune; the horns of the crescent point downwind.

**basic sector** Those products or services of an urban economy that are exported outside the city itself, earning income for the community.

**bench mark** A surveyor’s mark indicating the position and elevation of some stationary object; used as a reference point in surveying and mapping.

**bioaccumulation** The buildup of a material in the body of an organism.

**biocide** A chemical used to kill plant and animal pests and disease organisms. *See also* herbicide, pesticide.

**biodiversity hot spot** An area with an exceptionally high number of endemic species that is at high risk of disruption by human activities.

**biological magnification** The accumulation of a chemical in the fatty tissue of an organism and its concentration at progressively higher levels in the food chain; biomagnification.

**biomagnification** *See* biological magnification.

**biomass** Living matter, plant and animal, in any form.

**biomass fuel** Any organic material produced by plants, animals, or microorganisms that can be used as a source of energy through either direct burning or conversion into a liquid or gas.

**biome** The total assemblage of living organisms in a single major ecological region.

**biosphere** (*syn.*: ecosphere) The thin film of air, water, and earth within which we live, including the atmosphere, surrounding and subsurface waters, and the upper reaches of the earth’s crust.

**birth rate** (*syn.*: crude birth rate) The ratio of the number of live births during 1 year to the total population, usually at the midpoint of the same year, expressed as the number of births per year per 1000 population.

**blizzard** A heavy snowstorm accompanied by high winds.

**boundary** A line separating one political unit from another.

**boundary definition** A general agreement between two states about the allocation of territory between them.

**boundary delimitation** The plotting of a boundary line on maps or aerial photographs.

**boundary demarcation** The actual marking of a boundary line on the ground; the final stage in boundary development.

**butte** A small, flat-topped, isolated hill with steep sides, common in dry climate regions.

## C

**carcinogen** A substance that produces or incites cancerous growth.

**carrying capacity** The numbers of any population that can be adequately supported by the available resources upon which that population subsists; for humans, the numbers supportable

- by the known and utilized resources—usually agricultural—of an area.
- cartogram** A map that has been simplified to present data in a diagrammatic way; the base normally is not true to scale.
- cartography** The art, science, and technology of making maps.
- caste** One of the hereditary social classes in Hinduism that determines one's occupation and position in society.
- central business district (CBD)** The center, or "downtown," of an urban unit, where retail stores, offices, and cultural activities are concentrated and where land values are high.
- central city** That part of the metropolitan area contained within the boundaries of the main city around which suburbs have developed.
- central place** A nodal point for the distribution of goods and services to a surrounding hinterland population.
- central place theory** A deductive theory formulated by Walter Christaller (1893–1969) to explain the size and distribution of settlements through reference to competitive supply of goods and services to dispersed rural populations.
- centrifugal force** In political geography, a force that disrupts and destabilizes a state, threatening its unity.
- centripetal force** In political geography, a force that promotes unity and national identity.
- CFCs** *See* chlorofluorocarbons.
- chain migration** The process by which migration movements from a common home area to a specific destination are sustained by links of friendship or kinship between first movers and later followers.
- channelization** The modification of a stream channel; specifically, the straightening of meanders or dredging of the stream channel to deepen it.
- channelized migration** The tendency for migration to flow between areas that are socially and economically allied by past migration patterns, by economic trade considerations, or by some other affinity.
- chemical weathering** The decomposition of earth materials because of chemical reactions that include oxidation, hydration, and carbonation.
- chlorofluorocarbons (CFCs)** A family of synthetic chemicals that have significant commercial applications but whose emissions are contributing to the depletion of the ozone layer.
- choropleth map** A map that depicts quantities for areal units by varying pattern and/or color.
- circumpolar vortex** High-altitude winds circling the poles from west to east.
- city** A multifunctional nucleated settlement with a central business district and both residential and nonresidential land uses.
- climate** The long-term average weather conditions in a place or region.
- climax community** An association of grasses, shrubs, and/or trees that is in equilibrium with the climate and soil of the site; the last stage of an ecological succession.
- climograph** A bar and line graph used to depict average monthly temperatures and precipitation.
- cogeneration** The simultaneous use of a single fuel for the generation of electricity and low-grade central heat.
- cognition** The process by which an individual gives mental meaning to information.
- cohort** A population group unified by a specific common characteristic, such as age, and who are treated as a statistical unit during their lifetimes.
- commercial economy** The production of goods and services for exchange in competitive markets where price and availability are determined by supply and demand forces.
- commercial energy** Commercially traded fuels such as coal, oil, or natural gas and excluding wood, vegetable or animal wastes, or other biomass.
- Common Market** *See* European Union.
- compact state** A state whose territory is nearly circular.
- comparative advantage** A region's profit potential for a productive activity compared with alternative areas of production of the same good or with alternative uses of the region's resources.
- concentric zone model** A model describing urban land uses as a series of circular belts or rings around a core central business district, each ring housing a distinct type of land use.
- conformal projection** A map projection on which the shapes of small areas are accurately portrayed.
- conic projection** A map projection based on the projection of the grid system onto a cone as the presumed developable surface.
- connectivity** The directness of routes linking pairs of places; all of the tangible and intangible means of connection and communication between places.
- consequent boundary** (*syn:* ethnographic boundary) A boundary line that coincides with some cultural divide, such as religion or language.
- conservation** The wise use or preservation of natural resources so as to maintain supplies and qualities at levels sufficient to meet present and future needs.
- contagious diffusion** The spread of a concept, a practice, or an article from one area to others through contact and/or the exchange of information.
- continental drift** The hypothesis that an original single landmass (Pangaea) broke apart and that the continents have moved very slowly over the asthenosphere to their present locations.
- contour interval** The vertical distance separating two adjacent contour lines.
- contour line** A map line along which all points are of equal elevation above or below a datum plane, usually mean sea level.
- conurbation** An extended urban area formed by the coalescence of two or more formerly separate cities.
- convection** The circulatory movement of rising warm air and descending cool air.
- convective precipitation** Rain produced when heated, moisture-laden air rises and then cools below the dew point.
- Convention on the Law of the Sea** *See* Law of the Sea Convention.
- coral reef** A rocklike landform in shallow tropical water composed chiefly of compacted coral and other organic material.
- core** The nucleus of a region or country, the main center of its industry, commerce, population, political, and intellectual life; in urban geography, that part of the central business district characterized by intensive land development.
- core area** The nucleus of a state, containing its most developed area, greatest wealth, densest populations, and clearest national identity.
- Coriolis effect** A fictitious force used to describe motion relative to a rotating earth; specifically, the force that tends to deflect a moving object or fluid to the right (clockwise) in the Northern Hemisphere and to the left (counterclockwise) in the Southern Hemisphere.
- countermigration** *See* return migration.
- country** *See* state.
- creole** A language developed from a pidgin to become the native tongue of a society.
- critical distance** The distance beyond which cost, effort, and/or means play an overriding role in the willingness of people to travel.
- crude birth rate (CBR)** *See* birth rate.
- crude death rate (CDR)** *See* death rate.
- crude density** (*syn:* arithmetic density, population density) The number of people per unit area of land.
- crude oil** A mixture of hydrocarbons that exists in a liquid state in underground reservoirs; petroleum as it occurs naturally, as it comes from an oil well, or after extraneous substances have been removed.
- cultural convergence** The tendency for cultures to become more alike as they increasingly share technology and organization structures in a modern world united by improved transportation and communication.
- cultural divergence** The likelihood or tendency for isolated cultures to become increasingly dissimilar with the passage of time.
- cultural ecology** The study of the interactions between societies and the natural environments they occupy.
- cultural integration** The interconnectedness of all aspects of a culture; no part can be altered without impact upon other culture traits.
- cultural lag** The retention of established culture traits despite changing circumstances rendering them inappropriate.
- cultural landscape** The natural landscape as modified by human activities and bearing the imprint of a culture group or society; the built environment.
- culture** A society's collective beliefs, symbols, values, forms of behavior, and social organizations, together with its tools, structures, and artifacts; transmitted as a heritage to succeeding generations and undergoing adoptions, modifications, and changes in the process.
- culture complex** An integrated assemblage of culture traits descriptive of one aspect of a society's behavior or activity.
- culture—environment tradition** One of the four traditions of geography; in this text, identified with population, cultural, political, and behavioral geography.
- culture hearth** A nuclear area within which an advanced and distinctive set of culture traits develops and from which there is diffusion of distinctive technologies and ways of life.
- culture realm** A collective of culture regions sharing related culture systems; a major world area having sufficient distinctiveness to be perceived

as set apart from other realms in its cultural characteristics and complexes.

**culture region** A formal or functional region within which common cultural characteristics prevail. It may be based on single culture traits, on culture complexes, or on political, social, or economic integration.

**culture system** A generalization suggesting shared, identifying traits uniting two or more culture complexes.

**culture trait** A single distinguishing feature of regular occurrence within a culture, such as the use of chopsticks or the observance of a particular caste system; a single element of learned behavior.

**cyclone** A type of atmospheric disturbance in which masses of air circulate rapidly about a region of low atmospheric pressure.

**cyclonic precipitation** (*syn*: frontal precipitation) The rain or snow that is produced when moist air of one air mass is forced to rise over the edge of another air mass.

**cylindrical projection** A map projection based on the projection of the globe grid onto a cylinder as the presumed developable surface.

**D**

**database** *See* geographic database.

**DDT** A chlorinated hydrocarbon that is among the most persistent of the biocides in general use.

**death rate** (*syn*: crude death rate, mortality rate) A mortality index usually calculated as the number of deaths per year per 1000 population.

**decomposers** Microorganisms and bacteria that feed on dead organisms, causing their chemical disintegration.

**deforestation** The clearing of land through total removal of forest cover.

**delta** A triangular-shaped deposit of mud, silt, or gravel created by a stream where it flows into a body of standing water.

**demographic equation** A mathematical expression that summarizes the contribution of different demographic processes to the population change of a given area during a specified time period:  $P_2 = P_1 + B_{1-2} - D_{1-2} + IM_{1-2} - OM_{1-2}$ , where  $P_2$  is population at time 2;  $P_1$  is population at beginning date;  $B_{1-2}$  is the number of births between times 1 and 2;  $D_{1-2}$  is the number of deaths during that period;  $IM_{1-2}$  is the number of in-migrants and  $OM_{1-2}$  is the number of out-migrants between times 1 and 2.

**demographic momentum** *See* population momentum.

**demographic transition** A model of the effect of economic development on population growth. The first stage involves both high birth and death rates; the second phase displays high birth rates and falling mortality rates and population increases. Phase three shows reduction in population growth as birth rates decline to the level of death rates. The final, fourth, stage implies again a population stable in size but larger in numbers than at the start of the transition cycle.

**demography** The scientific study of population, with particular emphasis upon quantitative aspects.

**density of population** *See* population density.

**dependency ratio** The number of dependents, old or young, that each 100 persons in the productive years must, on average, support.

**deposition** The process by which silt, sand, and rock particles accumulate and create landforms such as stream deltas and talus slopes.

**desertification** The conversion of arid and semi-arid lands into deserts as a result of climatic change or human activities such as overgrazing or deforestation.

**developable surface** A geometric form, such as a cylinder or cone, that may be flattened without distortion.

**devolution** The transfer of certain powers from the state central government to separate political subdivisions within the state's territory; decentralization of political control.

**dew point** The temperature at which condensation forms, if the air is cooled sufficiently.

**dialect** A regional or socioeconomic variation of a more widely spoken language.

**diastrophism** The earth force that folds, faults, twists, and compresses rock.

**dibble** Any small hand tool or stick used to make a hole for planting.

**diffusion** *See* spatial diffusion.

**distance** The amount of separation between two objects, areas, or points; an extent of areal or linear measure.

**distance decay** The exponential decline of an activity or a function with increasing distance from its point of origin.

**domestication** The successful transformation of plant or animal species from a wild state to a condition of dependency upon human management, usually with distinct physical change from wild forebears.

**doubling time** The time period required for any beginning total, experiencing a compounding growth, to double in size.

**dune** A wavelike desert landform created by wind-blown sand.

**E**

**earthquake** The movement of the earth along a geologic fault or at some other point of weakness at or near the earth's surface.

**earth science tradition** One of the four traditions of geography, identified with physical geography in general.

**ecology** The scientific study of how living creatures affect each other and what determines their distribution and abundance.

**economic base** The manufacturing and service activities performed by the basic sector of the labor force of a city to satisfy demands both inside and outside the city and earn income to support the urban population.

**economic geography** The study of how people earn a living, how livelihood systems vary by area, and how economic activities are spatially interrelated and linked.

**ecosphere** *See* biosphere.

**ecosystem** A population of organisms existing together in a particular area, together with the energy, air, water, soil, and chemicals upon which it depends.

**ecumene** The permanently inhabited areas of the earth. *See also* nonecumene.

**electoral geography** The study of the delineation of voting districts and the spatial patterns of election results.

**electromagnetic spectrum** The entire range of radiation, including the shortest as well as the longest wavelengths.

**El Niño** The periodic (every 3 to 7 or 8 years) buildup of warm water along the west coast of South America; replacing the cold Humboldt current off the Peruvian coast, El Niño is associated with both a fall in plankton levels (and decreased fish supply) and short-term, widespread weather modification.

**elongated state** A state whose territory is long and narrow.

**enclave** A territory that is surrounded by, but is not part of, a state.

**endangered species** Species that are present in such small numbers that they are in imminent danger of extinction.

**energy** The ability to do work. *See also* kinetic energy, potential energy.

**energy efficiency** The ratio of the output of useful energy from a conversion process to the total energy inputs.

**environment** Surroundings; the totality of things that in any way may affect an organism, including both physical and cultural conditions; a region characterized by a certain set of physical characters.

**environmental determinism** The view that the physical environment, particularly climate, molds human behavior and conditions cultural development.

**environmental justice** The goal of providing healthy surroundings for all people, regardless of their skin color, level of poverty, or place of residence.

**environmental perception** The way people observe and interpret, as well as the ideas they have about near or distant places.

**environmental pollution** *See* pollution.

**environmental racism** Any policy or practice that differentially affects or harms individuals, groups, or communities because of their race or color; the harm may be intentional or unintentional.

**epidemiologic transition** Long-term shifts in health and disease patterns as mortality moves from high to low levels.

**equal-area projection** *See* equivalent projection.

**equator** An imaginary line that encircles the globe halfway between the North and South Poles.

**equidistant projection** A map projection on which true distances in all directions can be measured from one or two central points.

**equivalent projection** A map projection on which the areas of regions are represented in correct or constant proportions to earth reality; also called equal-area projection.

**erosion** The result of processes that loosen, dissolve, wear away, and remove earth and rock material. Those processes include weathering, solution, abrasion, and transportation.

**erosional agents** The forces of wind, moving water, glaciers, waves, and ocean currents that carve, wear away, and remove rock and soil particles.



**estuarine zone** The relatively narrow area of wetlands along coastlines where salt water and fresh water mix.

**estuary** The lower course or mouth of a river where tides cause fresh water and salt water from the sea to mix.

**ethanol** Organic matter that has been fermented and distilled into alcohol; an alternative automotive fuel that when blended with gasoline forms gasohol.

**ethnic cleansing** The killing or forcible relocation of one traditional or ethnic group by a more powerful one.

**ethnicity** The social status afforded to, usually, a minority group within a national population. Recognition is based primarily upon culture traits such as religion, distinctive customs, or native or ancestral national origin.

**ethnic religion** A religion identified with a particular ethnic group and largely exclusive to it.

**ethnocentrism** The belief that one's own ethnic group is superior to all others.

**ethnographic boundary** *See* consequent boundary.

**European Union (EU)** An economic association established in 1957 of a number of Western European states that promotes free trade among member countries; often called the Common Market.

**eutrophication** The enrichment of a water body by the addition of nutrients received through erosion and runoff from the watershed. *See also* accelerated eutrophication.

**evapotranspiration** The return of water from the land to the atmosphere through evaporation from the soil surface and transpiration from plants.

**exclave** A portion of a state that is separated from the main territory and surrounded by another country.

**exclusive economic zone (EEZ)** As established in the United Nations Convention on the Law of the Sea, a zone of exploitation extending 200 nautical miles seaward from a coastal state that has exclusive mineral and fishing rights over it.

**exotic species** A plant, animal, or other organism that has been deliberately or inadvertently introduced into an ecosystem in which it did not evolve; a nonindigenous species.

**extensive agriculture** A crop or livestock system in which land quality or extent is more important than capital or labor inputs in determining output. It may be part of either a commercial or a subsistence economy.

**extensive commercial agriculture** Extensive farming in a commercial economy; examples include large-scale wheat farming and livestock ranching.

**extensive subsistence agriculture** Extensive farming in a subsistence economy; examples include nomadic herding and shifting cultivation.

**external economies** *See* agglomeration economies.

**extinction** The elimination of all of the individuals of a particular species.

**extractive industries** Primary activities involving the mining and quarrying of nonrenewable metallic and nonmetallic mineral resources.

**extrusive rock** Rock solidified from molten material (magma) that has flowed from beneath the earth's surface onto it.

## F

**faults** Breaks or fractures in rock produced by stress or the movement of lithospheric plates.

**fault escarpment** A steep slope formed by the vertical movement of the earth along a fault.

**fiord** A glacial trough whose lower end is filled with seawater.

**floodplain** A valley area bordering a stream that is subject to inundation by flooding.

**flow-line map** A map used to portray linear movement between places; may be qualitative or quantitative.

**fold** A bend or wrinkle in rock resulting from compression and formed when the rock was in a plastic state.

**folk culture** The body of institutions, customs, dress, artifacts, collective wisdoms, and traditions of a homogeneous, isolated, largely self-sufficient, and relatively static social group.

**food chain** A sequence of organisms through which energy and materials move within an ecosystem.

**footloose** A descriptive term applied to manufacturing activities for which the cost of transporting material or product is not important in determining location of production.

**Fordism** The manufacturing economy and system derived from assembly line mass production and the mass consumption of standardized goods. Named after Henry Ford, who innovated many of its production techniques.

**foreign direct investment** The purchase or construction of foreign factories and other fixed assets by transnational corporations; also the purchase of or merging with foreign companies.

**formal (uniform) region** A region distinguished by uniformity of one or more characteristics that can serve as the basis for an areal generalization and of contrast with adjacent areas.

**form utility** A value-increasing change in the form—and therefore in the utility—of a raw material or commodity.

**forward-thrust capital** A capital city deliberately sited in a state's frontier zone.

**fossil fuel** Any of the fuels derived from decayed organic material converted by earth processes; especially, coal, petroleum, and natural gas but also including tar sands and oil shales.

**fragmented state** A state whose territory contains isolated parts, separated and discontinuous.

**frictional effect** In climatology, the slowing of wind movement due to the frictional drag of the earth's surface.

**friction of distance** A measure of the retarding effect of distance on spatial interaction. Generally, the greater the distance, the greater the "friction" and the less the interaction or exchange, or the greater the cost of achieving the exchange.

**front** The line or zone of separation between two air masses of different temperatures and humidities.

**frontal precipitation** *See* cyclonic precipitation.

**frontier** That portion of a country adjacent to its boundaries and fronting another political unit.

**frontier zone** A belt lying between two states or between settled and uninhabited or sparsely settled areas.

**Fujita scale** A scale for categorizing tornado intensity.

**functional (nodal) region** A region differentiated by what occurs within it rather than by a homogeneity of physical or cultural phenomena; an earth area recognized as an operational unit based on defined organizational criteria.

## G

**gated community** A restricted-access subdivision or neighborhood, often surrounded by a barrier, with entry permitted only for residents and their guests; usually totally planned in land use and design.

**gathering industries** Primary activities involving the harvesting of renewable natural resources of land or water; commercial gathering usually implies forestry and fishing industries.

**gender** The socially created, not biologically based, distinctions between femininity and masculinity.

**gender empowerment measure (GEM)** A statistic summarizing the extent of economic, political, and professional participation of women in the society of which they are members; a measure of relative gender equality.

**gene flow** The passage of genes characteristic of one breeding population into the gene pool of another by interbreeding.

**genetic drift** A chance modification of gene composition occurring in an isolated population and becoming accentuated through inbreeding.

**gentrification** The process by which middle- and high-income groups refurbish and rehabilitate housing in deteriorated inner-city areas, thereby displacing low-income populations.

**geocaching** The pursuit of a cache using a GPS unit.

**geodetic control data** The information specifying the horizontal and vertical positions of a place.

**geographic database** In cartography, a digital record of geographic information.

**geographic grid** The set of imaginary lines of latitude and longitude that intersect at right angles to form a system of reference for locating points on the surface of the earth.

**geographic information system (GIS)** A configuration of computer hardware and software for assembling, storing, manipulating, analyzing, and displaying geographically referenced information.

**geometric boundary** (*syn:* artificial boundary) A boundary without obvious physical geographic basis; often a section of a parallel of latitude or a meridian of longitude.

**geomorphology** The scientific study of landform origins, characteristics, and evolutions and their processes.

**geothermal energy** Energy that is generated by harnessing the naturally occurring steam and hot water produced by contact with heated rocks in the earth's crust.

**gerrymandering** Dividing an area into voting districts in such a way as to give one political party an unfair advantage in elections, to fragment voting blocks, or to achieve other nondemocratic objectives.

**GIS** *See* geographic information system.

**glacial till** The deposits of rocks, silt, and sand left by a glacier after it has receded.

**glacial trough** A deep, U-shaped valley or trench formed by glacial erosion.

**glacier** A huge mass of slowly moving land ice.

**globalization** The increasing interconnection of all parts of the world as the full range of social, cultural, political, economic, and environmental processes and patterns of change becomes international in scale and effect.

**Global Positioning System (GPS)** A method of using satellite observations for the determination of extremely accurate locational information.

**global warming** A rise in surface temperatures on Earth, a process believed by some to be caused by human activities that increase the concentration of greenhouse gases in the atmosphere, magnifying the greenhouse effect.

**globe grid** *See* grid system.

**globe properties** The characteristics of the grid system of longitude and latitude on a globe.

**GPS** *See* Global Positioning System.

**gradational processes** The processes of weathering, gravity transfer, and erosion that are responsible for the reduction of the land surface.

**grade (of coal)** A classification of coals based on their content of waste materials.

**graphic scale** A graduated line included in a map legend by means of which distances on the map may be measured in terms of ground distances.

**great circle** A circle formed by the intersection of the surface of a globe with a plane passing through the center of the globe. The equator is a great circle; meridians are one-half a great circle.

**greenbelt** A ring of parks, farmland, or undeveloped land around a community.

**greenhouse effect** The heating of the earth's surface as shortwave solar energy passes through the atmosphere, which is transparent to it but opaque to reradiated longwave terrestrial energy. Also refers to increasing the opacity of the atmosphere through the addition of increased amounts of carbon dioxide, nitrous oxides, methane, and chlorofluorocarbons.

**greenhouse gases** Heat-trapping gases added to the atmosphere by human activities; carbon dioxide, chlorofluorocarbons, methane gas, and nitrous oxide.

**Green Revolution** The term suggesting the great increases in food production, primarily in subtropical areas, accomplished through the introduction of very high yielding grain crops, particularly wheat and rice.

**Greenwich mean time (GMT)** Local time at the prime meridian (zero degrees longitude), which passes through the observatory at Greenwich, England.

**gross national income (GNI)** *See* gross national product (GNP).

**gross national product (GNP)** The total value of all goods and services produced by a country per year; also called gross national income (GNI).

**groundwater** Underground water that accumulates in aquifers below the water table in the pores and cracks of rock and soil.

## H

**half-life** The time required for one-half the atomic nuclei of an isotope to decay.

**hazardous waste** Discarded solid, liquid, or gaseous material that may pose a substantial threat to human health or the environment when it is improperly disposed of, stored, or transported.

**herbicide** A chemical that kills plants, especially weeds. *See also* biocide, pesticide.

**hierarchical diffusion** The process by which contacts between people and the resulting diffusion of things or ideas occurs first among those at the same level of a hierarchy and then among elements at a lower level of the hierarchy (e.g., small-town residents acquire ideas or articles after they are common in large cities).

**hierarchical migration** The tendency for individuals to move from small places to larger ones.

**hierarchy of central places** The steplike series of urban units in classes differentiated by both size and function.

**high-level waste** Nuclear waste that can remain radioactive for thousands of years, produced principally by the generation of nuclear power and the manufacture of nuclear weapons.

**hinterland** An outlying region that furnishes raw materials or agricultural products to the heartland; the market area or region served by a town or city.

**homeostatic plateau** The equilibrium level of population that can be supported adequately by available resources; equivalent to carrying capacity.

**humid continental climate** A climate of east coast and continental interiors of midlatitudes, displaying large annual temperature ranges resulting from cold winters and hot summers; precipitation at all seasons.

**humid subtropical climate** A climate of the east coast of continents in lower middle latitudes, characterized by hot summers with convective precipitation and cool winters with cyclonic precipitation.

**humus** Dark brown or black decomposed organic matter in soils.

**hunting-gathering** An economic and social system based primarily or exclusively on the hunting of wild animals and the gathering of food, fiber, and other materials from uncultivated plants.

**hurricane** A severe tropical cyclone with winds exceeding 120 kilometers per hour (75 mph) originating in the tropical region of the Atlantic Ocean, Caribbean Sea, or Gulf of Mexico.

**hydrologic cycle** The system by which water is continuously circulated through the biosphere by evaporation, condensation, and precipitation.

**hydropower** The kinetic energy of moving water converted into electrical power by a power plant whose turbines are driven by flowing water.

**hydrosphere** All water at or near the earth's surface that is not chemically bound in rocks; includes the oceans, surface waters, groundwater, and water held in the atmosphere.

## I

**iconography** In political geography, the study of symbols that unite a country.

**ideological subsystem** The complex of ideas, beliefs, knowledge, and means of their communication that characterize a culture.

**igneous rock** Rock formed from cool, solidified magma; may solidify beneath or at the earth's surface.

**incinerator** A facility designed to burn waste.

**inclination** The tilt of the earth's axis about 23½° away from the perpendicular.

**Industrial Revolution** The term applied to the rapid economic and social changes in agriculture and manufacturing that followed the introduction of the factory system to the textile industry of England in the last quarter of the 18th century.

**infant mortality rate** A refinement of the death rate to specify the ratio of deaths of infants age 1 year or less per 1000 live births.

**infrared** Electromagnetic radiation having wavelengths greater than those of visible light.

**infrastructure** The basic structure of services, installations, and facilities needed to support industrial, agricultural, and other economic development.

**innovation** Introduction into an area of new ideas, practices, or objects; an alteration of custom or culture that originates within the social group itself.

**insolation** The solar radiation received at the earth's surface.

**intensive agriculture** The application of large amounts of capital and/or labor per unit of cultivated land to increase output; may be part of either a commercial or a subsistence economy.

**intensive commercial agriculture** Intensive farming in a commercial economy; crops have high yields and high market value.

**intensive subsistence agriculture** Intensive farming in a subsistence economy; the cultivation of small landholdings through the expenditure of great amounts of labor.

**International Date Line** By international agreement, the designated line where each new day begins; generally following the 180th meridian.

**intrusive rock** Igneous rock from magma that has hardened beneath the earth's surface and that has penetrated or been forced into or between pre-existing rocks.

**irredentism** The desire of a state to gain or regain territory inhabited by people who have historic or cultural links to the country but who now live in a neighboring state.

**isochrone** A line connecting points that are equidistant in travel time from a common origin.

**isoline** A map line connecting points of equal value, such as a contour line or an isobar.

**isotropic plain** A hypothetical portion of the earth's surface assumed to be an unbounded, uniformly flat plain with uniform distribution of population, purchasing power, transport costs, accessibility, and the like.

## J

**J-curve** A curve shaped like the letter J, depicting exponential or geometric growth (1, 2, 4, 8, 16 . . .).

**jet stream** A meandering belt of strong winds in the upper atmosphere; significant because it guides the movement of weather systems.

## K

**karst topography** A limestone region marked by sinkholes, caverns, and underground streams.

**kerogen** A waxy, organic material occurring in oil shales that can be converted into crude oil by distillation.

**kinetic energy** The energy that results from the motion of a particle or body.

## L

**land breeze** Airflow from the land toward the sea, resulting from a nighttime pressure gradient that moves winds from the cooler land surface to the warmer sea surface.

**landform region** A large section of the earth's surface characterized by a great deal of homogeneity among types of landforms.

**landlocked state** A state that lacks a seacoast.

**Landsat satellite** One of a series of continuously orbiting satellites that carry scanning instruments to measure reflected light in both the visible and near-infrared portions of the spectrum.

**landscape** The appearance of an area and the items comprising that appearance. A distinction is often made between "physical landscapes" confined to landforms, natural vegetation, soils, etc., and "cultural landscapes" (q.v.).

**language** An organized system of speech by which people communicate with each other with mutual comprehension.

**language family** A group of languages thought to have descended from a single, common ancestral tongue.

**La Niña** The cool ebb in low-latitude Pacific Ocean surface temperatures that occurs between El Niño peaks of sea-surface warming.

**lapse rate** The rate of change of temperature with altitude in the troposphere; the average lapse rate is about 6.4°C per 1000 meters (3.5°F per 1000 ft).

**large-scale map** A representation of a small land area, usually with a representative fraction of 1:75,000 or less.

**latitude** The angular distance north or south of the equator, measured in degrees ranging from 0° (the equator) to 90° (the North and South Poles).

**lava** Molten material that has emerged onto the earth's surface.

**Law of the Sea Convention** A code of sea law approved by the United Nations in 1982 that authorizes, among other provisions, territorial waters extending 12 nautical miles from shore and 200-nautical-mile-wide exclusive economic zones; generally referred to as UNCLOS.

**leachate** The contaminated liquid discharged from a sanitary landfill to either surface or subsurface land or water.

**leaching** The downward movement of water through the soil layer, resulting in the removal of soluble minerals from the upper soil horizons.

**least-cost theory** (*syn.*: Weberian analysis) The view that the optimum location of a manufacturing establishment is at the place where the costs of transport and labor and the advantages of agglomeration or dispersion are most favorable.

**levee** In agriculture, a continuous embankment surrounding areas to be flooded. *See also* natural levee.

**lingua franca** Any of the various auxiliary languages used as common tongues among people of an area where several languages are spoken.

**liquefied natural gas (LNG)** Methane gas that has been liquefied by refrigeration for storage or transportation.

**lithosphere** The outermost layer of the earth, composed of the crust and upper mantle.

**loam** Agriculturally productive soil containing roughly equal parts of sand, silt, and clay.

**locational tradition** One of the four traditions of geography; in this text, identified with economic, urban, and environmental geography.

**loess** A deposit of windblown silt.

**longitude** The angular distance east or west of the prime (zero) meridian, measured in degrees ranging from 0° to 180°.

**long lot** A farm or other property consisting of a long, narrow strip of land extending back from a river or road.

**longshore current** A current that moves roughly parallel to the shore and transports the sand that forms beaches and sand spits.

**low-level waste** Hazardous material whose radioactivity will decay to safe levels in 100 years or less, produced principally by industries and nuclear power plants.

## M

**magma** Underground molten material.

**malnutrition** Food intake insufficient in quantity or deficient in quality to sustain life at optimal conditions of health.

**Malthus** Thomas R. Malthus (1766–1834), English economist, demographer, and cleric, who suggested that, unless checked by self-control, war, or natural disaster, population will inevitably increase faster than will the food supplies needed to sustain it.

**mantle** The layer of earth between the crust and the core.

**map projection** A method of transferring the grid system from the earth's curved surface to the flat surface of a map.

**map scale** *See* scale.

**marine west coast climate** A regional climate found on the west coast of continents in upper midlatitudes, rainy all seasons with relatively cool summers and relatively mild winters.

**market economy** *See* commercial economy.

**mass movement** (*syn.*: mass wasting) The downslope movement of earth materials due to gravity.

**mass wasting** *See* mass movement.

**material culture** The tangible, physical items produced and used by members of a specific culture group and reflective of their traditions, lifestyles, and technologies.

**maximum sustainable yield** The maximum rate at which a renewable resource can be exploited without impairing its ability to be renewed or replenished.

**mechanical weathering** The physical disintegration of earth materials, commonly by frost action, root action, or the development of salt crystals.

**Mediterranean climate** A climate of lower midlatitudes characterized by mild, wet winters and hot, dry, sunny summers.

**megalopolis** An extensive, heavily populated urban complex with contained open, nonurban land, created through the spread and merging of separate metropolitan areas; (*cap.*) the name applied to the continuous functionally urban area of the northeastern seaboard of the United States from Maine to Virginia.

**megawatt** A unit of power equal to 1 million watts (1000 kilowatts) of electricity.

**mental map** The maplike image of the world, country, region, or other area a person carries in his or her mind; includes knowledge of actual locations and spatial relationships and is colored by personal perceptions and preferences related to place.

**mentifacts** The central, enduring elements of a culture that express its values and beliefs, including language, religion, folklore, artistic traditions, and the like. Elements in the ideological subsystem of culture.

**Mercator projection** A true conformal cylindrical projection first published in 1569, useful for navigation.

**meridian** A north-south line of longitude; on the globe, all meridians are of equal length and converge at the poles.

**mesa** An extensive, flat-topped elevated tableland with horizontal strata, a resistant cap rock, and one or more steep sides; a large butte.

**metamorphic rock** Rock transformed from igneous and sedimentary rocks into a new type of rock by earth forces that generate heat, pressure, or chemical reaction.

**metes-and-bounds survey** A system of property description that uses natural features (trees, boulders, streams, etc.) to describe and define the boundaries of individual properties.

**metropolitan area** A large functional entity, perhaps containing several urbanized areas, discontinuously built up but operating as a coherent economic whole.

**migration** The permanent (or relatively permanent) relocation of an individual or a group to a new, usually distant, place of residence.

**migration field** An area that sends major migration flows to or receives major flows from a given place.

**mineral** A natural inorganic substance that has a definite chemical composition and characteristic crystal structure, hardness, and density.

**ministate** An imprecise term for a state or territory small in both population and area. An informal definition accepted by the United Nations suggests a maximum of 1 million people combined with a territory of less than 700 square kilometers (270 sq mi).

**monoculture** An agricultural system dominated by a single crop.

**monotheism** The belief that there is only one God.

**monsoon** A wind system that reverses direction seasonally, producing wet and dry seasons; used especially to describe the wind system of South, Southeast, and East Asia.

**moraine** Any of several types of landforms composed of debris transported and deposited by a glacier.



**mortality rate** See death rate.

**mountain breeze** The downward flow of heavy, cool air at night from mountainsides to lower valley locations.

**multiple-nuclei model** The idea that large cities develop by peripheral spread, not from one central business district but from several nodes of growth, each of specialized use.

**multiplier effect** The expected addition of non-basic workers and dependents to a city's total employment and population that accompanies new basic sector employment.

## N

**nation** A culturally distinctive group of people occupying a particular region and bound together by a sense of unity arising from shared ethnicity, beliefs, and customs.

**nationalism** A sense of unity binding the people of a state together; devotion to the interests of a particular nation; an identification with the state and an acceptance of national goals.

**nation-state** A state whose territory is identical to that occupied by a particular nation.

**natural boundary** (*syn:* physical boundary) A boundary line based on recognizable physiographic features, such as mountains, rivers, or deserts.

**natural gas** A mixture of hydrocarbons and small quantities of nonhydrocarbons existing in a gaseous state or in solution with crude oil in natural reservoirs.

**natural increase** The growth of a population through excess of births over deaths, excluding the effects of immigration or emigration.

**natural landscape** The physical *environment* unaffected by human activities. The duration and near totality of human occupation of the earth's surface assure that little or no "natural landscape" so defined remains intact. Opposed to *cultural landscape*.

**natural levee** An embankment on the sides of a meandering river formed by deposition of silt during floods.

**natural resource** A physically occurring item that a population perceives to be necessary and useful to its maintenance and well-being.

**natural selection** The process of survival and reproductive success of individuals or groups best adjusted to their environment, leading to the perpetuation of those genetic qualities most suited to that environment.

**natural vegetation** The plant life that would exist in an area if humans did not interfere with its development.

**neo-Malthusianism** The advocacy of population control programs to preserve and improve general national prosperity and well-being.

**neritic zone** The relatively shallow part of the sea that lies above the continental shelf.

**net migration** The difference between in-migration and out-migration of an area.

**niche** The place an organism or a species occupies in an ecosystem.

**nomadic herding** The migratory but controlled movement of livestock solely dependent upon natural forage.

**nonbasic sector** Those economic activities of an urban unit that supply the resident population with goods and services.

**nonecumene** (*syn:* anecumene) The portion of the earth's surface that is uninhabited or only temporarily or intermittently inhabited. See also *ecumene*.

**nonfuel mineral resource** A mineral used for purposes other than providing a source of energy.

**nongovernmental organization (NGO)** A group of people acting outside government and major commercial agencies and advocating or lobbying for particular causes.

**nonmaterial culture** The oral traditions, songs, and stories of a culture group along with its beliefs and customary behaviors.

**nonpoint source of pollution** Pollution from a broad area, such as one of fertilizer or pesticide application, rather than from a discrete source.

**nonrenewable resource** A natural resource that is not replenished or replaced by natural processes or is used at a rate that exceeds its replacement rate.

**North and South Poles** The end points of the axis about which the earth spins.

**North Atlantic drift** The massive movement of warm water in the Atlantic Ocean from the Caribbean Sea and Gulf of Mexico in a northeasterly direction to the British Isles and the Scandinavian peninsula.

**nuclear fission** The controlled splitting of an atom to release energy.

**nuclear fusion** The combining of two atoms of deuterium into a single atom of helium in order to release energy.

**nuclear power** Electricity generated by a power plant whose turbines are driven by steam produced by the fissioning of nuclear fuel in a reactor.

**nutrient** A mineral or another element an organism requires for normal growth and development.

## O

**offshoring** The relocation of business processes and services to a lower-cost foreign location; the offshore outsourcing of, particularly, white-collar technical, professional, and clerical services.

**oil shale** Sedimentary rock containing solid organic material (kerogen) that can be extracted and converted into a crude oil by distillation.

**ore** A mineral deposit that can be extracted at a profit.

**organic** Derived from living organisms; plant or animal life.

**Organization of Petroleum Exporting Countries (OPEC)** An international cartel composed of 11 countries that aims at pursuing common oil marketing and pricing policies.

**orographic precipitation** The rain or snow caused when warm, moisture-laden air is forced to rise over hills or mountains in its path and is thereby cooled.

**orthophotomap** A multicolored, distortion-free aerial photographic image to which certain supplementary information has been added.

**outsourcing** (1) Producing abroad parts or products for domestic use or sale; (2) subcontracting production or services rather than performing those activities "in house."

**outwash plain** A gently sloping area in front of a glacier composed of neatly stratified glacial till carried out of the glacier by meltwater streams.

**overburden** Soil and rock of little or no value that overlies a deposit of economic value, such as coal.

**overpopulation** A value judgment that the resources of an area are insufficient to sustain adequately its present population numbers.

**oxbow lake** A crescent-shaped lake contained in an abandoned meander of a river.

**ozone** A gas molecule consisting of three atoms of oxygen (O<sub>3</sub>) formed when diatomic oxygen (O<sub>2</sub>) is exposed to ultraviolet radiation. In the lower atmosphere, it constitutes a damaging component of photochemical smog; in the upper atmosphere, it forms a normally continuous, thin layer that blocks ultraviolet light.

**ozone layer** A layer of ozone in the high atmosphere that protects life on Earth by absorbing ultraviolet radiation from the sun.

## P

**parallel of latitude** An east-west line indicating the distance north or south of the equator.

**PCBs** Polychlorinated biphenyls; compounds containing chlorine that can be biologically magnified in the food chain.

**peak value intersection** The most accessible and costly parcel of land in the central business district and, therefore, in the entire urbanized area.

**perceptual region** A region perceived to exist by its inhabitants or the general populace. Also known as a vernacular region or popular region, it has reality as an element of popular culture or folk culture represented in the mental maps of average people.

**perforated state** A state whose territory is interrupted ("perforated") by a separate, independent state totally contained within its borders.

**peripheral model** A model describing metropolitan area land uses in the circumferential belt around a city; nodes on the belt are centers for employment or services, and residents of the developments on the belt lead their lives largely on the periphery of the city.

**permafrost** Permanently frozen subsoil.

**perpetual resource** A resource that comes from an inexhaustible source, such as the sun, wind, and tides.

**pesticide** A chemical that kills insects, rodents, fungi, weeds, and other pests. See also *biocide*, *herbicide*.

**Peters projection** An equal-area cylindrical projection developed by Arno Peters that purports to show developing countries in proper proportion to one another.

**petroleum** Oil and oil products in all forms, such as crude oil and unfinished oils.

**pH factor** The measure of the acidity/alkalinity of soil or water, on a scale of 0 to 14, rising with increasing alkalinity.

**photochemical smog** A form of air pollution produced by the interaction of hydrocarbons and oxides of nitrogen in the presence of sunlight.

**photovoltaic (PV) cell** A device that converts solar energy directly into electrical energy. *See also* solar power.

**physical boundary** *See* natural boundary.

**physiological density** The number of persons per unit area of agricultural land. *See also* population density.

**pidgin** An auxiliary language derived, with reduction of vocabulary and simplification of structure, from other languages. Not a native tongue, it is employed to provide a mutually intelligible vehicle for limited transactions of trade or administration.

**pixel** An extremely small sensed unit of a digital image.

**place utility** (1) The perceived attractiveness of a place in its social, economic, or environmental attributes; (2) the value imparted to goods or services by tertiary activities that provide things needed in specific markets.

**planar projection** A map projection based on the projection of the globe grid onto a plane as the presumed developable surface.

**planned economy** A system of the production of goods and services, usually consumed or distributed by a governmental agency, in quantities and at prices determined by governmental programs.

**plantation** A large agricultural holding, frequently foreign-owned, devoted to the production of a single export crop.

**plate tectonics** The theory that the earth's crust consists of lithospheric plates that carry the continents and the ocean floor and float slowly on the plastic upper mantle, colliding with and scraping against one another.

**playa** A temporary lake or lake bed found in a desert environment.

**Pleistocene** The geologic epoch dating from 2 million to about 10,000 years ago during which four stages of continental glaciation occurred.

**point source of pollution** Pollution originating from a discrete source, such as a smokestack or the outflow from a pipe.

**political geography** A branch of human geography concerned with the spatial analysis of political phenomena.

**pollution** The presence in the biosphere of substances that, because of their quantity, chemical nature, or temperature, have a negative impact on the ecosystem or that cannot be readily disposed of by natural recycling processes.

**polychlorinated biphenyls** *See* PCBs.

**polytheism** The belief in or worship of many gods.

**popular culture** The constantly changing mix of material and nonmaterial elements available through mass production and the mass media to an urbanized, heterogeneous, nontraditional society.

**popular region** *See* perceptual region.

**population density** (*syn.* crude density) A measurement of the numbers of persons per unit area of land within predetermined limits, usually political or census boundaries. *See also* physiological density.

**population geography** The branch of human geography dealing with the number, composition, and distribution of humans in relation to variations in earth-space conditions.

**population momentum** (*syn.* demographic momentum) The tendency for population growth to continue despite stringent family planning programs because of a relatively high concentration of people in the childbearing years.

**population projection** A report of future size, age, and sex composition of a population based on assumptions applied to current data.

**population pyramid** A graphic depiction of the age and sex composition of a (usually national) population.

**possibilism** The philosophical viewpoint that the physical environment offers human beings a set of opportunities from which (within limits) people may choose according to their cultural needs and technological awareness.

**potential energy** The energy stored in a particle or body.

**potentially renewable resource** A resource that can last indefinitely if its natural replacement rate is not exceeded; examples include forests, ground-water, and soil.

**precipitation** All moisture, solid and liquid, that falls to the earth's surface from the atmosphere.

**pressure gradient force** Differences in air pressure between areas that induce air to flow from areas of high pressure to areas of low pressure.

**primary activity** The part of the economy involved in making natural resources available for use or further processing; includes mining, agriculture, forestry, fishing or hunting, grazing.

**primary air pollutant** Material, such as particulates or sulfur dioxide, that is emitted directly into the atmosphere in sufficient quantities to adversely affect human health or the environment.

**primate city** A country's leading city, much larger and functionally more complex than any other; usually the capital city and a center of wealth and power.

**prime meridian** An imaginary line passing through the Royal Observatory at Greenwich, England, serving by agreement as the zero degree line of longitude.

**projection** An estimate of future conditions based on current trends. *See also* map projection.

**prorupt state** A state of basically compact form that has one or more narrow extensions of territory.

**proto-language** An assumed, reconstructed, or recorded language ancestral to one or more contemporary languages or dialects.

**proved (usable) reserves** The portion of a natural resource that has been identified and can be extracted profitably with current technology.

**psychological distance** The way an individual perceives distance.

**pull factor** A characteristic of a region that acts as an attractive force, drawing migrants from other regions.

**purchasing power parity (PPP)** A monetary measurement that takes account of what money actually buys in each country.

**push factor** A characteristic of a region that contributes to the dissatisfaction of residents and impels their migration.

## Q

**quaternary activity** That employment concerned with research, with the gathering or disseminating of information, and with administration, including administration of the other economic activity levels.

**quinary activity** A sometimes separately recognized subsection of tertiary activity management functions involving highest-level decision making in all types of large organizations. Also deemed the most advanced form of the quaternary subsector.

## R

**race** A subset of human population whose members share certain distinctive, inherited biological characteristics.

**radioactive waste** Solid, liquid, or gaseous waste containing radioactive isotopes, whose half-lives can range from less than one second to millions of years; usually classified as low-level or high-level according to the amount and types of radioactivity in the substance.

**rank (of coal)** A classification of coals based on their age and energy content; those of higher rank are more mature and richer in energy.

**rank-size rule** An observed regularity in the city-size distribution of some countries. In a rank-size hierarchy, the population of any given town will be inversely proportional to its rank in the hierarchy; that is, the  $n$ th-ranked city will be  $1/n$  the size of the largest city.

**rate** The frequency of occurrence of an event during a specified time period.

**rate of natural increase** The birth rate minus the death rate, suggesting the annual rate of population growth without considering net migration.

**recycling** The reuse of disposed materials after they have passed through some form of treatment (e.g., melting down glass bottles to produce new bottles).

**redistricting** The drawing of new electoral district boundary lines in response to changing patterns of population or changing legal requirements.

**reflection** The process of returning to outer space some of the earth's received insolation.

**region** In geography, the term applied to an area of the earth that displays a distinctive grouping of physical or cultural phenomena or is functionally united as a single organizational unit.

**regional autonomy** A measure of self-governance for a subdivision of a country.

**regional concept** The view that physical and cultural phenomena on the surface of the earth are rationally arranged by complex but comprehensible spatial processes.

**regionalism** In political geography, minority group identification with a particular region of a state rather than with the state as a whole.

**relative direction** (*syn.* relational direction) A culturally based locational reference, such as the Far West, the Old South, or the Middle East.

**relative distance** A transformation of *absolute distance* into such relative measures as time or monetary costs. Such measures yield different explanations of human spatial behavior than do linear distances alone. Distances between places



are constant by absolute terms, but relative distances may vary with improvements in transportation or communication technology or with different psychological perceptions of space.

**relative humidity** A measure of the moisture content of the air, expressed as the amount of water vapor present relative to the maximum that can exist at the current temperature.

**relative location** The position of a place or an activity in relation to other places or activities.

**relic boundary** A former boundary line that is still discernible and marked by a cultural landscape feature.

**religion** A value system that involves formal or informal worship and faith in the sacred and divine.

**relocation diffusion** The transfer of ideas, behaviors, or articles from one place to another through the migration of those possessing the feature transported; also, spatial relocation in which a phenomenon leaves an area of origin as it is transported to a new location.

**remote sensing** Any of several techniques of obtaining images of an area without having the sensor in direct physical contact with it, as by air photography or satellite sensors.

**renewable resource** A naturally occurring material that is potentially inexhaustible, either because it flows continuously (such as solar radiation or wind) or is renewed within a short period of time (such as biomass). *See also* sustained yield.

**replacement level** The number of children per family just sufficient to keep total population constant. Depending on mortality conditions, replacement level is usually calculated to be between 2.1 and 2.5 children.

**representative fraction (RF)** The scale of a map expressed as a ratio of a unit of distance on the map to distance measured in the same unit on the ground (e.g., 1:250,000).

**reradiation** A process by which the earth returns solar energy to space; some of the shortwave solar energy that is absorbed into the land and water is returned to the atmosphere in the form of longwave terrestrial radiation.

**resource** *See* natural resource.

**return migration** The return of migrants to the region from which they had earlier emigrated.

**rhumb line** A line of constant compass bearing; it cuts all meridians at the same angle.

**Richter scale** A logarithmic scale used to express the magnitude of an earthquake.

**S**

**Sahel** The semiarid zone between the Sahara Desert and the savanna area to the south in West Africa; district of recurring drought, famine, and environmental degradation.

**salinization** The concentration of salts in the topsoil as a result of the evaporation of surface water; occurs in poorly drained soils in dry climates, often as a result of improper irrigation.

**sandbar** An off-shore shoal of sand created by the backwash of waves.

**sanitary landfill** The disposal of solid wastes by spreading them in layers covered with enough soil or ashes to control odors, rats, and flies.

**savanna** A tropical grassland characterized by widely dispersed trees and experiencing pronounced yearly wet and dry seasons.

**scale** In cartography, the ratio between length or size of an area on a map and the actual length or size of that same area on the earth's surface; map scale may be represented verbally, graphically, or as a fraction. In more general terms, *scale* refers to the size of the area studied, from local to global.

**S-curve** The horizontal bending, or leveling, of an exponential J-curve.

**sea breeze** Airflow from the sea toward the land, resulting from a daytime pressure gradient that moves winds from the cooler sea surface onto the warmer land surface.

**secondary activity** The part of the economy involved in the processing of raw materials derived from primary activities; includes manufacturing, construction, power generation.

**sector model** A description of urban land uses as wedge-shaped sectors radiating outward from the central business district along transportation corridors. The radial access routes attract particular uses to certain sectors.

**secularism** An indifference to or rejection of religion and religious belief.

**sedimentary rock** Rock formed by the accumulation of particles of gravel, sand, silt, and clay that were eroded from already existing rocks and laid down in layers.

**seismic waves** Vibrations within the earth set off by earthquakes.

**self-determination** The concept that nationalities have the right to govern themselves in their own state or territory, a right to self-rule.

**shaded relief** A method of representing the three-dimensional quality of an area by use of continuous graded tone to simulate the appearance of sunlight and shadows.

**shale oil** The crude oil resulting from the distillation of kerogen in oil shales.

**shamanism** A form of tribal religion based on belief in a hidden world of gods, ancestral spirits, and demons responsive only to a shaman, or interceding priest.

**shifting cultivation** (*syn:* slash-and-burn agriculture, swidden agriculture) Crop production of forest clearings kept in cultivation until their quickly declining fertility is lost. Cleared plots are then abandoned and new sites are prepared.

**sinkhole** A deep surface depression formed when ground collapses into a subterranean cavern.

**site** The place where something is located; the immediate surroundings and their attributes.

**situation** The location of something in relation to the physical and human characteristics of a larger region.

**slash-and-burn agriculture** *See* shifting cultivation.

**small circle** The line created by the intersection of a spherical surface with a plane that does not pass through its center.

**small-scale map** A representation of a large land area on which small features (e.g., highways, buildings) cannot be shown true to scale.

**sociofacts** The institutions and links between individuals and groups that unite a culture, including family structure and political, educational, and

religious institutions; components of the sociological subsystem of culture.

**sociological subsystem** The totality of expected and accepted patterns of interpersonal relations common to a culture or subculture.

**soil** The complex mixture of loose material, including minerals, organic and inorganic compounds, living organisms, air, and water, found at the earth's surface and capable of supporting plant life.

**soil depletion** The loss of some or all of the vital nutrients from soil.

**soil erosion** The wearing away and removal of soil particles from exposed surfaces by agents such as moving water, wind, or ice.

**soil horizon** A layer of soil distinguished from other soil zones by color, texture, and other characteristics resulting from soil-forming processes.

**soil order** A general grouping of soils with broadly similar composition, horizons, and weathering and leaching processes.

**soil profile** A vertical cross section of soil horizons.

**soil properties** The characteristics that distinguish types of soil from one another, including organic and inorganic matter, texture, structure, and nutrients.

**solar energy** Radiation from the sun, which is transformed into heat primarily at the earth's surface and secondarily in the atmosphere.

**solar power** The radiant energy generated by the sun; sun's energy captured and directly converted for human use. *See also* photovoltaic cell.

**solid waste** The unwanted materials generated in production or consumption processes that are solid rather than liquid or gaseous in form.

**source region** In climatology, a large area of uniform surface and relatively consistent temperatures where an air mass forms.

**southern oscillation** The atmospheric conditions occurring periodically near Australia that create the El Niño condition off the coast of South America.

**spatial diffusion** The outward spread of a substance, a concept, a practice or a population from its point of origin to other areas.

**spatial distribution** The arrangement of things on the earth's surface.

**spatial interaction** The movement (e.g., of people, goods, information) between different places; an indication of interdependence between areas.

**spatial margin of profitability** The set of points delimiting the area within which a firm's profitable operation is possible.

**special-purpose map** *See* thematic map.

**spring wheat** Wheat sown in spring for ripening during the summer or autumn.

**stage in life** Membership in a specific age group.

**standard language** A language substantially uniform with respect to spelling, grammar, pronunciation, and vocabulary and representing the approved community norm of the tongue.

**standard parallel** The tangent circle, usually a parallel of latitude, in a conic projection; along the standard line, the scale is as stated on the map.

**state** (*syn:* country) An independent political unit occupying a defined, permanently populated territory and having full sovereign control over its internal and foreign affairs.

**step (stepwise) migration** A *migration* in which an eventual long-distance relocation is undertaken in stages as, for example, from farm to village to small town to city.

**steppe** The name applied to treeless midlatitude grasslands.

**stratosphere** The layer of the atmosphere that lies above the troposphere and extends outward to about 56 kilometers (35 mi).

**stream load** The eroded material carried by a stream in one of three ways, depending on the size and composition of the particles: (1) in dissolved form, (2) suspended by water, or (3) rolled along the stream bed.

**subduction** The process by which one lithospheric plate is forced down beneath another into the asthenosphere as a result of a collision with that plate.

**subnationalism** The feeling that one owes primary allegiance to a traditional group or nation rather than to the state.

**subsequent boundary** A boundary line that is established after the area in question has been settled and that considers the cultural characteristics of the bounded area.

**subsidence** The settling or sinking of a portion of the land surface, sometimes as a result of the extraction of fluids, such as oil or water, from underground deposits.

**subsistence agriculture** Any of several farm economies in which most crops are grown for food, nearly exclusively for local consumption.

**subsistence economy** A system in which goods and services are created for the use of producers or their immediate families. Market exchanges are limited and of minor importance.

**substitution principle** In industry, the tendency to substitute one factor of production for another in order to achieve optimum plant location and profitability.

**suburb** A functionally specialized segment of a large urban complex located outside the boundaries of the central city.

**succession** A natural process in which an orderly sequence of plant species will occupy a newly established landform or a recently altered landscape.

**superimposed boundary** A boundary line placed over, and ignoring, an existing cultural pattern.

**supranationalism** The acceptance of the interests of more than one state, expressed as associations of states created for mutual benefit and to achieve shared objectives.

**surface water** Water that is on the earth's surface, such as in rivers, streams, reservoirs, lakes, and ponds.

**sustainable development** Economic development and resource use that satisfies current needs without jeopardizing the ability of future generations to meet their own needs.

**sustained yield** The practice of balancing harvesting with growth of new stocks in order to avoid depletion of the resource and ensure a perpetual supply.

**swidden agriculture** See shifting cultivation.

**syncretism** The development of a new form of, for example, religion or music, through the fusion of distinctive parental elements.

**syntax** The way words are put together in phrases and sentences.

**systems analysis** An approach to the study of large systems through (1) segregation of the entire system into its component parts, (2) investigation of the interactions between system elements, and (3) study of inputs, outputs, flows, interactions, and boundaries within the system.

## T

**talus slope** A landform composed of rock particles that have accumulated at the base of a cliff, hill, or mountain.

**tar sand** Sand and sandstone impregnated with heavy oil.

**technological subsystem** The complex of material objects together with the techniques of their use by means of which people carry out their productive activities.

**technology** An integrated system of knowledge and skills developed within a culture to carry out successfully purposeful and productive tasks.

**tectonic forces** The processes that shape and reshape the earth's crust, the two main types being diastrophic and volcanic.

**temperature inversion** The condition caused by rapid reradiation in which air at lower altitudes is cooler than air aloft.

**territoriality** The persistent attachment of most animals to a specific area; the behavior associated with the defense of the home territory.

**territorial production complex** In the economic planning of the former Soviet Union, a design for large regional industrial, mining, and agricultural development leading to regional self-sufficiency and the creation of specialized production for a larger national market.

**terrorism** The calculated use of violence against civilians and other symbolic targets in order to publicize a cause or to diminish people's support for a leader, a government, a policy, or a way of life that the perpetrators of violence find objectionable.

**tertiary activity** The part of the economy that fulfills the exchange function and that provides market availability of commodities; includes wholesale and retail trade and associated transportation, government, and information services.

**thematic map** (*syn:* special-purpose map) A map that shows a specific spatial distribution or category of data.

**thermal pollution** The introduction of heated water into the environment, with consequent adverse effects on aquatic life.

**Third World** Originally (in the 1950s), designating countries uncommitted to either the "First World" Western capitalist bloc or the Eastern "Second World" communist bloc; subsequently, countries considered not yet fully developed or in a state of underdevelopment in economic and social terms.

**threatened species** A species that has declined significantly in total numbers and may be on the

verge of extinction; an endangered or vulnerable species.

**threshold** In economic geography, the minimum market needed to support the supply of a product or service.

**topographic map** A map that portrays the shape and elevation of the terrain, often in great detail.

**toponym** A place-name.

**toponymy** The place-names of a region or, especially, the study of place-names.

**tornado** A small, violent storm characterized by a funnel-shaped cloud of whirling winds that can form beneath a cumulonimbus cloud in proximity to a cold front and that moves at speeds as high as 480 kilometers per hour (300 mph).

**total fertility rate (TFR)** The average number of children that would be born to each woman if, during her childbearing years, she bore children at the current year's rate for women that age.

**town** A nucleated settlement that contains a central business district but that is smaller and less functionally complex than a city.

**township and range system** A rectangular survey system whose basic units of areas are the township and section; it identifies townships as being north or south of a particular baseline and east or west of a particular principal meridian. Townships are subdivided into square sections one mile on a side.

**traditional religion** See tribal religion.

**tragedy of the commons** The observation that in the absence of collective control over the use of a resource available to all, it is to the advantage of all users to maximize their separate shares even though their collective pressures may diminish total yield or destroy the resource altogether.

**transform fault** A break in rocks that occurs when one lithospheric plate slips past another in a horizontal motion.

**transnational corporation (TNC)** A large business organization operating in at least two separate national economies.

**tribal religion** (*syn:* traditional religion) An ethnic religion specific to a small, localized, preindustrial culture group.

**tropical rain forest** The tree cover composed of tall, high-crowned evergreen deciduous species, associated with the continuously wet tropical lowlands.

**tropical rain forest climate** The continuously warm, frost-free climate of tropical and equatorial lowlands, with abundant moisture year-round.

**troposphere** The atmospheric layer closest to the earth, extending outward about 11 to 13 kilometers (7 to 8 mi) at the poles to about 26 kilometers (16 mi) at the equator.

**truck farming** The intensive production of fruits and vegetables for market rather than for processing or canning.

**tsunami** Sea waves generated when an earthquake, eruption, or underwater landslide abruptly moves the seabed, jolting the waters above.

**tundra** The treeless area lying between the tree line of Arctic regions and the permanently ice-covered zone.

**typhoon** A hurricane occurring in the western Pacific Ocean region.

## U

**ubiquitous industry** A market-oriented industry whose establishments are distributed in direct proportion to the distribution of population (market).

**underpopulation** A value statement reflecting the view that an area has too few people in relation to its resources and population-supporting capacity.

**unitary state** A state in which the central government dictates the degree of local or regional autonomy and the nature of local governmental units; a country with few cultural conflicts and a strong sense of national identity.

**United Nations Convention on the Law of the Sea (UNCLOS)** *See* Law of the Sea Convention.

**universalizing religion** A religion that claims global truth and applicability and seeks the conversion of all humankind.

**urban hierarchy** The steplike series of urban units (e.g., hamlets, villages, towns, cities, metropolises) in classes differentiated by size and function.

**urban influence zone** An area outside of a city that is nevertheless affected by the city.

**urbanization** The transformation of a population from rural to urban status; the process of city formation and expansion.

**urbanized area** A continuously built-up urban landscape defined by building and population densities with no reference to the political boundaries of the city; it may contain a central city and many contiguous towns, cities, suburbs, and unincorporated areas.

**usable reserves** *See* proved reserves.

## V

**valley breeze** The flow of air up mountain slopes during the day.

**value-by-area map** *See* area cartogram.

**variable costs** In economic geography, the costs of production inputs that change as the level of production changes. They differ from the costs incurred by agricultural or industrial firms that are fixed and do not change as the amount of production changes.

**verbal scale** A statement of the relationship between units of measure on a map and distance on the ground, as “1 inch represents 1 mile.”

**vernacular** (1) The nonstandard indigenous language or dialect of a locality; (2) of or related to indigenous arts and architecture, such as a vernacular house; (3) of or related to the perceptions and understandings of the general population, such as a vernacular region.

**vernacular region** *See* perceptual region.

**volcanism** The earth force that transports subsurface materials (often heated, sometimes molten) to or toward the surface of the earth.

**von Thünen model** The model developed by Johann H. von Thünen (1783–1850) to explain the forces that control the prices of agricultural commodities and how those variable prices affect patterns of agricultural land utilization.

**von Thünen rings** The concentric zonal pattern of agricultural land use around a single market center proposed in the von Thünen model.

**vulnerable species** Species whose numbers have been so reduced that they could become threatened or endangered.

## W

**warping** The bowing of a large region of the earth's surface due to the movement of continents or the melting of continental glaciers.

**wash** A dry, braided channel in the desert that remains after the rush of rainfall runoff water.

**water table** The upper limit of the saturated zone and therefore of groundwater; the top of the water within an aquifer.

**weather** The state of the atmosphere at a given time and place.

**weathering** The mechanical and chemical processes that fragment and decompose rock materials.

**Weberian analysis** *See* least-cost theory.

**Weber model** The analytical model devised by Alfred Weber (1868–1958) to explain the principles governing the optimum location of industrial establishments.

**wetland** A vegetated inland or coastal area that is either occasionally or permanently covered by standing water or saturated with moisture.

**wind farm** A cluster of wind-powered turbines producing commercial electricity.

**wind power** The kinetic energy of wind converted into mechanical energy by wind turbines that drive generators to produce electricity.

**winter wheat** Wheat planted in autumn for early summer harvesting.

**world city** One of a small number of interconnected, internationally dominant centers (e.g., New York, London, Tokyo) that together control the global systems of finance and commerce.

## Z

**zero population growth (ZPG)** A situation in which a population is not changing in size from year to year, as a result of the combination of births, deaths, and migration.

**zoning** Designating by ordinance areas in a municipality for particular types of land use.



