

Hunter College of the City University of New York
Department of Geography
GEOG 101 People and Their Environment

CLIMATE and PEOPLE -- AN OVERVIEW

I. Physical Aspects of Climate

The elements of weather (see hand out and text book) in unique combinations give the Earth's surface the characteristics we call *climate*. It is important to be able to locate the climates on the Earth's surface and discuss their physical characteristics (weather), describing **why** these characteristics occur and how they interrelate to natural vegetation, soils, agricultural practices (see text book) and the development of the cultural landscape.

II. People in the Rainy Tropical Climates (A Group)

A. Tropical rainforest subgroup (Af climate) is a seasonless climate with daily repetition of weather. It is characterized by year-round high temperature and humidity. Rainfall occurs nearly every day. Because of its weather characteristics, people in the Af region developed a minimal clothing dress and open house architectural styles. These are most practical in a high heat/high humidity situation.

The soils of the Af are poor unless constantly nourished. Because of the surplus of moisture along with the constant heat, the parent rock breaks down quickly when the vegetation cover is removed and the soluble minerals are washed away. *Humus*, the highly organic top soil, is almost lacking because of the incessant bacterial action. There is a rapid nutrient cycle: leaves drop and decay; nutrients are released into ground, mix with water and are absorbed by vegetation; new leaves grow. If you take away the leaves, you take away the source of the nutrients. Rain leaches away the nutrients in the soil and the soluble minerals from the ground; the insoluble iron and aluminum compounds remain giving the soil the characteristic reddish color. When the soil is exposed to air and heat, it dries hard, preventing water from being absorbed and seeds from sprouting. It can now be used as a building material!

Primitive subsistence farming (shifting, slash and burn, hunting and gathering) and high-tech commercial plantations are the chief agricultural methods found here. The climate is unfavorable for the raising of animals in captivity because of the threat of disease, insect pests and attack by wild animals in a fenced off environment.

Although the Af supports the greatest number of species of trees per square mile of any climate, forestry is of limited economic importance. Forestry operations are difficult because of thick vegetation and the "search and find" methods employed. When an area is cleared of its forest cover, a jungle environment develops. A *jungle* is an area of thick underbrush between trees. A true rainforest has no underbrush and, therefore, is not a jungle.

Historically, this is not a favorable climate for manufacturing. Heat, humidity facilitate rusting and corrosion; heat generating industries add to the difficulties. Climate control is expensive.

Even if agriculture, forestry and manufacturing thrive, there is the difficulty in getting goods to market. Overland movement is difficult. Roads and railroads are costly to build and maintain. Riv-

ers provide an important means for movement in an area but routes are limited by the rivers' courses. The river banks have dense vegetation because sunlight reaches the forest floor.

B. Tropical monsoon (Am) and the **tropical wet-dry or tropical savanna (Aw)** climates are, respectively, drier versions of the tropical rainy climate. *Savanna* (tall coarse grasses and scattered drought-resistant trees) is the predominant biome of this climate.

Tropical monsoon (Am) has a distinct rainy season of about 3 months with a dry season of less than 2 months. The rain is torrential and ineffective after the first week or so. The timing of the monsoon is extremely important to the people of the region. An early or late arrival and/or a shortened or prolonged season complicate any type of planning: agricultural, urban, military. The short wet/dry seasonal cycle allows for a variety of crops.

Tropical wet-dry (Aw) has a 6 month wet season followed by a six month dry season. Because of the prolonged dry season, this climate cannot support trees; bushes and tall grasses dominate and grade into short grasses as the amount of annual moisture decreases. Pastoral farming, usually nomadic, predominates. Nomads follow the cycle of the rainy season (*rain falls - grasses grow - animals graze - people arrive; rain stops - grasses die - animals move - people follow*). This puts less pressure on the environment than that of sedentary people who remain in the same place no matter the quality of the habitat.

III. People in the Dry Climates (B Group)

A. Water (or specifically the lack of it) **is the key factor in this climate group.** There is a moisture deficiency. Evaporation exceeds precipitation. The lack of moisture limits human use in this area. Population distribution, overland trade routes, agriculture and industry are tied to the location of *wells, wadis, oases* and *exotic rivers* (rivers that flow through an arid region). Plants and animals become specialized in order to survive in this environment. As in the tropical wet-dry climate, the nomadic way of life puts less pressure on the environment. Sand dunes (*ergs*) are a very small portion of the world's desert landscape; most of deserts are of the rocky (*reg*) variety.

B. Arid areas can be either hot (tropical desert - BWh, BSh) **or cold** (middle latitude desert - BWk, BSk). In the BWh, people have to adjust to large daily swings of temperature while in the BSh the annual range of temperature is great. In the BWk and BSk regions, the temperature extremes are not as pronounced. Precipitation in the dry climates is described as "deficient, unreliable and intense." The precipitation is intense because it is convectional in nature and may cause flash flooding. Dry stream beds and sluggish water courses may turn into raging rivers within minutes and almost as quickly may return to their previous state. People's use of these areas and their adaptation to the characteristics vary from region to region. This results in different cultural landscapes as people develop and use different technologies as they try to cope with the water deficiency aspect of the environment.

C. Traditional tropical dry area buildings (thick walls, shady gardens, fountains, high ceilings, small louvered windows, narrow streets, flat roofs) reflect aspects of the weather phenomena. Traditional dress of the desert peoples (long, loose fitting robes) are a reaction to protecting the body from the drying nature of wind, low humidity and heat.

D. Agriculture in the semi-arid environment (BS) varies. Grazing activities (extensive variety, meaning using a lot of area) predominate leading to the traditional *shifting subsistence pastoralism* of the nomads. People eat meat and milk from their herds and vegetables and dried fruit from the oases. In the middle latitudes, ranching predominates with cattle-raising in the wetter areas and sheep in the drier areas. Farming in the dry climates is intensive with the oasis and wadi the prime examples. Here layers of vegetation protect the soil and result in maximum use of the land. Irrigation is necessary in all varieties of this climate. Technology varies with society and culture. However, wide scale irrigation can lead to salinization, waterlogging, changes in the water table and subsidence of land from overpumping. The Dust Bowl of the U.S. in the 1920s and the problems of the Sahel in the 1970s to late 1980s are examples of human disturbance of a fragile natural environment.

E. Modern manufacturing is limited by the lack of water. Trading and home crafts are traditional occupations.

F. Mining activities are found in dry areas. The lack of a vegetation cover is beneficial.

IV. People in the Temperate Climates (C Group)

A. Subtropical climates (C group) occupy the area of the Earth between the tropics and the severe winter climates. They are influenced by the oceans and tropical air masses. No month's temperatures average below freezing. Their long summers and mild winters have fostered higher population densities and made them popular places for people to live. The amount of precipitation received differentiates the subgroups.

B. Humid Subtropical (Cfa) is one of the world's most densely populated and agriculturally productive climates. Irrigation is not needed and the long growing season allows for a variety of crops and, in some cases, double cropping within a growing season. However, the long history of human use, the high rainfall and the very short dormant period have put a strain on soil productivity. Naturally forested regions with a long history of human occupation, such as East Asia, have been deforested by farmers.

C. Temperate Marine or Marine West Coast (Cfb) climate is influenced by its proximity to warm ocean currents and on-shore winds. They are found further poleward than would be expected (e.g., along the coasts of Norway and Alaska), thus allowing people to live comfortably at higher latitudes. Harbors remain ice free during winter months in spite of the latitude. This permits year round fishing and interaction between coastal communities. Characterized by a high percent of cloudiness, agriculture is limited but forests thrive. (This area is also known as the "temperate rainforest.") As with the Cfa areas, Cfb areas with a long history of occupancy, as western Europe, no longer have a dense forest cover. Fishing and dairying provide important dietary supplements for people living there.

D. Dry Summer Subtropical or Mediterranean (Cs) climate is at the poleward transition from the dry climates to the humid versions of the subtropical. Because of their weather characteristics (dry, sunny summers) these regions have become the world's vacationlands (Riviera, Crimea, Perth, Southern California). The same characteristics are beneficial to the aircraft testing and motion picture industries. In the 20th century, these regions were turned into very productive agricultural areas because of modern irrigation technology. Without it, traditional drought resistant plants and

animals and dry climate farming methods characterize these regions. As with the dry climates, these areas are fragile and have problems associated with the weather characteristics found there. The weather cycle of arid summers, brush fire prone autumns, rainy winters accompanied by mudslides, happen year after year. Overgrazed slopes, removal of brush and trees complicate matters. Irrigated soils develop salinization problems, as does fresh water supplies, from the high rate of evaporation which leaves salts behind. Demand for water is greater than the supply.

V. People in the Humid Continental Climates (Dfa and Dfb Groups)

A. Humid continental or microthermal climates (Df) are northern hemisphere, land influenced climates that exhibit great seasonal variation in temperature. At least one month has an average temperature below freezing. The four seasons are distinct and daily weather changes result from the passage of warm and cold fronts. Major storms associated with the passage of the fronts play an important role in the lives of people living in these areas. These are the world's snowiest climates. Winter snowstorms can be especially deadly when accompanied by extreme cold and strong winds: *blizzard*.

B. Agriculture is a very important part of this climate's economic activity. Mixed commercial farming and the production of tree products are the dominant agricultural activities. Grains and livestock go hand-in-hand since livestock eat the grain, converting it to meat. As you move poleward, dairy cattle increase in importance and dairy products make up a larger share of the diet. Around the urban areas, horticulture is important.

C. Lumbering is important in these climates. The tree types change as you go poleward with cooler and shorter growing seasons. Deciduous trees predominate in the southern portion of the zone. The northern portion is characterized by coniferous trees.

D. The humid continental region contains the world's major industrial belts. It is said that the stimulating environment of constantly changing weather, the four seasons (planning aspect) and the long winters helped to foster a home crafts industry. To add to this, the ample supply of wood (fuel) and water were initial assets to industrial development which was more closely tied to the elements of the natural environment.

E. This climate is the most highly urbanized of the climates, possibly a result of industrialization, market orientation and the severe winters.

VI. People in the Subpolar (Dc, Dd Groups) and Polar (E Group) Climates

A. Cold is the chief characteristic and influence on people in the **Subpolar (Dc, Dd)** and **Polar (E)** groups. The summer periods are short to non-existent; frost can occur at any time of the year. The winters are long and cold. Precipitation is meager (equivalent to the B climates), with very little new snow received each year. Because of the low evaporation rate, the southern margins of the **Subpolar region (Dc, Dd)** can support forests, called *taiga*. The **Tundra (ET)** is located closer to the poles or at higher elevations where it is too cold for trees to grow; mosses, lichen and grasses are found there. The areas closest to the poles are permanently covered with ice and snow and are called **ice cap (EF)**.

B. In the subpolar regions agriculture is limited by a combination of short growing season and poor soils. Opposite of the tropical climates, decomposition is extremely slow with top soil frozen 5 or

more months. Nomadic herding (*moving north to the tundra in summer, south into the taiga in winter*), hunting, gathering, trapping, fishing are important food providing occupations. Lumbering of coniferous evergreens is also important as is the mining of minerals.

C. *Permafrost*, a condition unique to polar lands (see text), poses a problem to people. It impedes building construction and prevents the absorption of meltwater. The active layer on top of the permafrost zone freezes and thaws as the temperature changes. *Solifluction* is saturated top soil flowing under the force of gravity. *Frost heaving* is the disruption of the surface as water freezes and expands. This phenomena causes fence posts, roads and even buildings to slide down slope or be crushed under the force of expanding ice crystals. The poor drainage hampers overland transportation during the warm period and provides an excellent slack water breeding ground for billions of mosquitoes, black flies and other annoying insects.

D. Along the coastal areas of the subpolar region, fog and its accompanying gloom have created psychological problems for the year round inhabitants. As cold air passes over warm water or warm air over cold water, fog is formed. Added to the long winter nights and the constant cold, these areas have experienced very high alcoholism and suicide rates.

E. Ice serves to isolate many communities. *Sea ice* can be as thick as 15 feet and when chunks break off forming *icebergs*, there is a danger to shipping.

F. The **ice caps (EF)** are the least known and the harshest of all the climates. The coldest temperatures ever recorded (-127°F) are here. No month has an average temperature above freezing and the extremes of up to 6 months of light and dark are experienced. Except for scientists, these areas are uninhabited by people.

VII. People in the Highland Climates (H Group)

Highland climates (H) are a result of differences in elevation and orientation to the sun within a small area. They are influenced by altitude (*vertical zonation of climate*), exposure to solar energy (*sun facing slopes vs. slopes in shadow*), and changeability of weather (*thinner atmosphere, strong winds, landform barriers*). Highland climates may exhibit distinct seasons or have uniform conditions from the foothills to the summit. At the same elevation, weather conditions and the amount and form of precipitation received may vary on different sides of a valley and from valley to valley, as does natural vegetation and people's use of the land. In reaction, people use the different climate zones within the Highland group accordingly. For example, people will follow the "greening" of the slope uphill in spring, spending the summer at the highest elevations, before moving down slope with the progression of autumn. Winters are spent in the valley.

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