
Exercise 1

1) Start the Climate Diagram program by going to “Climate Diagram” on the ‘Start’ Menu.
   This is a shortcut to the file START.HTM. This file is located on CD's - 2 editions
2) Maximize window if not full screen
3) Click on ‘START HERE’
4) Click on ‘Documentation’ to learn about Climate Diagrams and how to use the programs, in particular the Sensitive Maps.
5) Enter ‘Sensitive Maps’ and navigate by selecting continent and tile, and then click arrow icons to shift to adjacent tiles. To select station, the point of the cursor needs to be dead on the triangle – the cursor will change to a hand and the station name will be displayed. Double click to get the climate diagram.
6) To print or export the diagram, select filetype (PDF or GIF) desired under ‘Printable Formats’. To copy a GIF into another application, right click on the diagram and select ‘Copy’. The following GIF was pasted into MSWord and resized.

![Climate Diagram](image-url)
1 Country name, station location and elevation, station name

2 The length of the observation period (y) for T and PPT, respectively

3 Annual average of T and annual PPT sum

4 T curve

5 PPT time series

6 Indication of frost periods

7 Mean daily max. T for the warmest month

8 Mean daily min. T for the coldest month
Fig. 5. Key to the climate diagrams with typical examples which are also examples for the different zonobiomes (see below).

Abscissa (horizontal axis): northern hemisphere, January to December, southern hemisphere, July to June (warm season thus always in the centre of the diagram).

Ordinate (vertical axis): temperature in °C, precipitation in mm. One division = 10 °C or 20 mm precipitation (figures are normally omitted).

Letters and numbers on the diagrams indicate the following:
1 station; 2 height above sea level, 3 number of years of observation (where two figures are given the first indicates temperature and the second precipitation); 4 mean annual temperature; 5 mean annual precipitation; 6 mean daily temperature minimum of the coldest month; 7 absolute minimum temperature (lowest recorded); 8 mean daily maximum temperature of the warmest month; 10 absolute maximum temperature (highest recorded); 10 mean daily temperature fluctuation. 8, 9 and 10 are only indicated for tropical stations with a diurnal climate. 11 curve of mean monthly temperature; 12 curve of mean monthly precipitation (1 scale unit = 20 mm, thus 10 °C = 20 mm); 13 = period of relative drought (dotted) for the climate region concerned; 14 corresponding relative humid season (vertical hatching); 15 mean monthly precipitation >100 (scale reduced to one-tenth, dark areas perhumid season; 16 supplementary precipitation curve, reduced to 10 °C = 30 mm, horizontal area above = relative dry period (only for steppe stations); 17 months with a mean daily minimum below 0 °C (black) = cold season; 18 months with absolute minimum below 0 °C (diagonally hatched), i.e. late or early frosts possible; 19 number of days with mean temperature above +10 °C (duration of vegetation period); 20 number of days with mean temperature above −10 °C. Not all of the above are available for every station. Where data are missing, the relevant places in the diagram are left empty.

The diagrams belong to the following zonobiomes:

ZB I (humid equatorial day climate): Yangami on the middle Congo; Buitenzorg (Bogor) Java;
ZB II (tropical summer climate): Salisbury in Zimbabwe;
ZB III (subtropical desert climate): Cairo on the lower Nile;
ZB IV (Mediterranean winter rain climate): Los Angeles in southern California;
ZB V (warm temperate climate): Nagasaki in Japan;
ZB VI (temperate, nemoral climate with short cold season): Washington, DC;
ZB VII (temperate semi-arid steppe climate with long dry season and slight drought): Odessa on the Black Sea;
ZB VIIa (temperate arid semi-desert climate with long drought): Achtuba on the lower Volga;
ZB VII (rII) (extreme arid desert climate with cold winters): Nukuss in central Asia;
ZB VIII (cold temperate climate with a very long winter) Archangelsk in the boreal taiga zone;
ZB IX (arctic tundra climate with July mean temperature below +10 °C): Karsije Vorota (island Vaigatsch)
Fig. 6. Examples from mountain stations in the various orobiomes: **OB I:** Páramo de Mucuchies in Venezuela; **OB II:** San Antonio de Los Covres in the Peruvian puna; **OB III:** Calama in the North Chilean desert puna; **OB IV:** Cedres in the Lebanon; **OB V:** Hotham Heights in the Snowy Mountains of Australia; **OB VI:** Zugspitze in the northern Alps; **OB VII:** Pikes Peak in the Rocky Mountains above the Great Plains of North America; **OB VIII:** Aishihik in southern Alaska; **OB IX:** Vostok on the ice cap of the Antarctic.
Figs. 19-21. Climatic type I. Humid-equatorial climate in Colombia, Cameroons and Australia (transitional to II).

Figs. 22-24. Climatic type II. Tropical climate with summer-rains in Brazil, South Africa (with frosts) and Australia.


Figs. 28-30. Climatic type IV. Etesian climate of E. Mediterranean type in Chile, South Africa and Portugal.
INTRODUCTION

Figs. 31-33. Climatic type V. Warm-temperate, humid climate in Uruguay, South Africa and North Anatolia.

Figs. 34-36. Climatic type VI. Temperate climate in Norway, Chile (very moist, mild winters, but cool summers) and U.S.A. (cold winters, but hot summers).

Figs. 37-39. Climatic type VII. Arid-temperate climate in Central Asia (extreme continental), Argentina (less extreme) and U.S.A.

Figs. 40-42. Climatic type VIII. Boreal-cold climate in Siberia (extreme continental), Central Russia and Sweden (less extreme).
Figs. 43-45. Climatic type IX. Arctic climate in North Russia (continental), Norway (moist) and Argentina (maritime).

Figs. 46-48. Climatic type X. Mountain stations in Ceylon (zone I), Lebanon (zone IV) and Chile (zone III).

identical. The boundaries of vegetation types are more irregular. The reason for this is that the distribution of vegetation is not only influenced by climate, but also by soil. For example, it was found in eastern Europe that the climatic diagrams in the steppe zone indicated, in addition to a drought period, a long dry period in summer; in the forest-steppe zone they indicated a dry period only and the forest zone lacked a dry period altogether. The borders of these climatic zones run from west-south-west to east-north-east (Walter, 1957). This is not the case for the vegetation types, which show large extensions in other directions. Forest extends southward on sandy soils and steppe vegetation penetrates into the forest zone on loess soils in the form of tongues and islands. Grasses are favoured on fine textured soils, because of their intensive root systems and their characteristic water requirements, while woody plants are favoured on coarse textured and stony soils, because of their extensive root systems and their slow rate of utilisation of water. This will be discussed later in more detail (see Chap. VI, 2). The origin of soils and their pedogenic development as influenced by climate has been discussed by Walter (1960, pp. 435-75; cf. Kubiena, 1948; Ganssen, 1957). Therefore, here the discussion will be restricted to a brief outline of the distribution of zonal soils in the world.