

# CLIMATOLOGY-DEFINATION, NATURE AND SCOPE

The study of the Earth falls into four broad categories:-

- I. The solid lithosphere
- II. The liquid hydrosphere
- III. The gaseous atmosphere
- IV. The life biosphere

- Climatology studies the gaseous atmosphere
- Climatology is the science of climate which study the Physical state of the atmosphere:-

--over a specific region

--during a specific period

--on the basis of climatic data

- Climatology is compounded of two Greek words, ***Klima*** and ***Logos***

--***Klima***- meaning *inclination that is latitude*

--***Logos***-meaning *science of study*

- So, climatology is a science that seeks to describe and explain:-
  - -- the nature of climate
  - -- why it differs from place to place
  - -- how it is related to other elements of the natural environment and human activities
- It is the study of the varieties of climates found on the Earth and their distribution over the surface of the Earth



# CLIMATOLOGY AND METEOROLOGY

- Climatology is closely related to meteorology
- Meteorology deals with the day to day atmospheric conditions and their causes
- Meteorology is defined as the Physics of the atmosphere
- Meteorology uses the methods of Physical science to interpret and explain the atmospheric processes
- Climatology collects and interpret the data observed by meteorology to investigate the spatial patterns of climate and its interaction
- Meteorologically it deals with the meteorological techniques and geographically it deals with the spatial aspects of climatic phenomena

# CLIMATOLOGY AND GEOGRAPHY

- Since geography studies the Earth as the habitat of Man it is closely related with climatology;-
- Climatology studies the atmospheric conditions
- Geography studies the spatial distribution of these climatic condition
- Through the study of climate, it serves the ends of geography, while the means employed by it are those of meteorology
- Climatology is a science whose methods are strictly meteorological and whose aims and results are geographical.

# DEFINATIONS OF CLIMATOLOGY

- Climatology is the science of climate which study the Physical and spatial state of the atmospheric conditions
- ***According to Critichfield:-***
  - ‘climatology is the science that seeks to describe and explain the nature of climate, how it differs from place to place and how it is related to man’s activities.’
- ***According to Austin Miller:-***
  - ‘Climatology is that branch of science which discusses the average conditions of weather.’
- ***According to Koppen and De Lang:-***
  - ‘Climatology is a summery, a composition of weather conditions over a long period of time.’
- ***According to Thornthwaite:-***
  - ‘Thornthwaite broadens the scope of climatology and suggest that it is the study of the atmosphere as well as the Earth’s surface.’

# **Climatology is applied to five fields:-**

- 1) Climatological records**
- 2) Theory of climate**
- 3) Energy and moisture balance**
- 4) Study of climate as the environment of living organisms**
- 5) Study of climate as the direct environment of Man**



# SUD-DIVISIONS OF CLIMATOLOGY

- The following are the sub-divisions of climatology:-

- **Physical climatology:-**

- seeks to explain the factors responsible for bringing out the temporal and spatial variations in heat exchange, moisture exchange and air movement
- Physical climatology is closely related to meteorology
- Physical climatology is a main aspect meteorology from which most of its basic principles are drawn
- the focus is on:-
  - i. The study of solar energy- its transformation at a location and its transfer through the atmosphere
  - ii. The complicated patterns and exchange of energy from one phase to another- from solid state to liquid state and from liquid state to vapor and vice versa



## ■ **Dynamic climatology:-**

--is global in scope

--it studies the thermodynamic processes in the atmosphere and the resultant atmospheric motions

--it investigate the impact of changes in various physical parameters on climate

--this branch of climatology includes:-

- i. The effect of the increase of greenhouse gases in global temperature
- ii. the role of mountains in determining the dynamics of the atmosphere
- iii. An investigation into sea-surface temperature

## ▪ **Synoptic climatology:-**

- deals with local or hemispheric climate from the view point of atmospheric circulation
- different circulation patterns lead to differences in climates
- it studies the relationship between circulation features and severe weather conditions-E.g.- the effect of El Nino and La Nina in creating severe weather conditions

## ■ **Regional climatology:-**

- This branch of climatology seeks to determine and describe the various types of world climates
- it is also known as descriptive climatology because it is concerned with the identification of important climatic characteristics and the interaction of weather and climatic elements upon the life, health and economic conditions of the people and areas

## ■ **Applied climatology:-**

- This branch of climatology is concerned with the application of the climatological knowledge to practical problems
- It analyses the relationship of climatology to other sciences
- The main purpose is to find out the ways and means to make use of our knowledge of climatic elements for the betterment of human life on the Earth

# Aims and objectives

- Climatology seeks to explain:-
  - the causes of different types of climates
  - The reasons for their variations
  - Their effects on natural vegetation
  - The processes that produce different climates
- Climatology makes a detail analysis of the interaction of weather and climatic elements upon human societies
- Climatology discusses the various climatic elements, the factors that control the distribution of climate over the Earth

