Climatology of mid latitudes

Business

This paper presents a book report on the climatology of Mid Latitudes. It basically gives an appraisal of the principles and processes which are critical in understanding both the evolution and behaviour of oceans and the atmosphere. According to the literature, the oceans are very important in the regulation of the climate of an area due to the fact that they have unique characteristics distinct from those of the land.

It is also believed by scientists that these characteristics have contributed greatly to creating a livable environment on earth. Oceans are great climate controllers since they require almost four times more energy to raise their temperature by one degree as compared to that of land. They are thus capable of transporting the heat from one location to another over a long period of time without losing it. The ocean also reacts minimally to the atmosphere but has a relatively large influence on the climate of the area surrounding them (Carmen 2010). The ocean’s thermohaline circulation which acts as its conveyor belt carries both warm water and salinity, which is the root of its existence, from one location to another.

The water that is dispatched can have a cooling or warming effect to the air indirectly and, therefore, the land over which the air is blown. For instance, the water from the Tropics and the subtropical Atlantic moves northwards through the Atlantic ocean as a current that is popularly referred to as the Gulf of Mexico. This has the effect of producing a relatively mild climate on Western Europe which is not expected in that latitude. Deep convention is a major factor that influences the occurrence of thermohaline circulation. The cool and warm water are mixed efficiently by this process, it thus affects the rate the sea ice melts and how much of solar radiation is absorbed.

Evaporation often removes water that is free of salt and so does ice formation, this leaves the water very salty and hence denser. The dense ocean water is then forced to sink and thus forming what is usually referred to as North Atlantic Deep Water (Kenneth & Gloria 2008). The ocean is capable of influencing the climate of a location over a short term and long term basis. Over the longest period of geological time scale, the circulation patterns of the oceans have been influenced by location and shape of the continent that borders it. However, the tectonic movements of the land masses often take a very long time to change the ocean. For instance, the continental plates averagely drift at about 5 cm per year while the mountain ranges often rise at about 1mm per year (Bauer 2009).

The patterns of circulation of oceans sometimes change so rapidly and thus result in variations in the terrestrial climate over a short period of time. This effect is often believed to be as a result of variations in the way that heat is stored and transported by the oceans. Climate system dynamics is often determined predominantly by the effects of the oceans and atmosphere which are also very closely linked. Changes that occur external to the system such as the radiation energy from the sun, the emission of greenhouse gases to the atmosphre, plant species distribution or the cloud cover also influence the temperature of the atmosphere and how the circulation between the atmosphere and the ocean occurs (Carmen 2010). Internal fluctuations in the system also often arise due to the turbulence of the ocean and the atmosphere. Fluctuations that are short term such as temperature and wind have a direct effect on the current and the temperatures of the ocean underlying water.

Oceanic fluctuations have the effect of magnifying, modifying or diminishing the fluctuations that occur in the atmosphere. The ocean acts as a megastore for both heat and carbon; the rate of heat absorption of the land as mentioned earlier is much greater and faster as compared to that of the ocean since it is a fluid. The ocean is, therefore, capable of diffusing the effects of the change in temperature over a very long distance and also through its vertical and convective movements. This is not possible on the land. The energy from the sun is thus only able to penetrate just a thin layer of the upper crust. The land is also able to lose the heat much faster back to the atmosphere as compared to the ocean which takes considerably a longer time to revert to the normal temperatures and hence the maritime climate is often less extreme as compared to the continental climate (Kenneth & Gloria 2008).

The surface currents of the ocean are largely driven by strong winds which result into powerful currents which constantly move the ocean’s waters. The other forces that cause ocean currents include the rotation of the earth, the oceans internal dynamics and also the effect of the presence of the continents. The deep oceanic flow, on the other hand, is mainly as a result of the difference in density that is caused by changes in temperature resulting into differential heating and cooling leading to evaporation and precipitation. The difference in densities is heavily influenced by the effects of the atmosphere, for instance, the clouds have the effect of blocking sun radiation from reaching the ocean thus leading to lower temperatures. When it rains, the rain water reduces the salinity of the sea water wind also has a direct influence on the rates of evaporation since stronger winds lead to

faster evaporation while weaker ones result into lower rates of evaporation (Carmen 2010).

The Mid Latitudes between the Tropics and the Polar Regions have weather patterns that are completely unique from those of the polar and tropical regions. They exhibit weather fronts and extra tropical cyclones and in some occasions they also experience the tropical cyclones. This region contains the widest of varieties of climate types ranging from cold and hot deserts to rainy woods and pine forests. Terrain, ocean currents and winds lead to the climate of the Mid Latitude varying considerably. Using the Koppen-Tregartha system, four basic climate types can be identified in this region.

These climates include B, steppes and deserts, C, humid tropical climate and D, continental climate which is characterized by high fluctuations. Specifically, the climates include Marine West coast climate, Mediterranean climate, variable highland climate, the humid continental, middle latitude desert,, middle latitude steppe, and the humid tropical climate (Kenneth & Gloria 2008). The Mediterranean climate is located in regions that are found between tropical desert climate and marine coast climate. These regions are mainly found between 40 degrees and 30 degrees latitude. The climate is characterized by wet winters and relatively dry summers with almost all the rainfalls received in this area falling during the winter season.

The average temperatures in summer are around 21 degrees while in winter the mean temperature is about 14 degrees thus the annual range of temperature is about 7 degrees. In winter, there are alternations between rainy and sunny days and in certain occasions the rainfall becomes irregular

and often varies from year to year. It is characterized by high pressure cells of the ocean which often move towards the poles in summer and towards the equator in the winter season. The region has mild winters and very hot summers and since most of these regions are near large water bodies, the temperatures are generally moderated and the range lower. The Mediterranean vegetation consists of forests, woodlands and scrubland. The most distinct feature in this region is the sclerophyll scrubland often referred to as marquis.

They are adapted to the annual climatic cycle, abiotic and biotic components. They control the populations and the structure of the communities. The natural vegetation is also adopted to be resistant to the long summer heat and very prolonged winter rains that sometimes cause floods. They constitute evergreen trees like oaks, deciduous trees like the Buckeyes, fruit trees like grapes, grasses like Rushes and shrubs (Carmen 2010). The Mid Latitude climate has had changes in the past and still, scientists believe that there will be more changes in the future.

As the average global temperatures increase, the transfer rate of water and its storage in the water cycle are expected to be affected with greater impacts experienced per region. Severe droughts, heavy flooding, high radiation heat waves and very cold spells have been experienced in various regions globally. In the Mid Latitude region, winters have been observed to become wetter and summers drier. The thermohaline circulation has been observed by scientists to be very fragile to the climate change. The increase in greenhouse gases has resulted into increased fresh water into the ocean through the melting of glaciers. The climate change has also resulted into

increased rainfall in the high latitudes which further reduces the salinity of the ocean water thus stopping the water from sinking and hence the circulation will be slower thus modifying the climate of the Mid Latitude (Kenneth & Gloria 2008).

In conclusion, the ocean is a very important component of the Mid Latitude region. It is the major contributor to the general conditions of this climate. Changes in the overall climate of the globe are certainly affecting also the Mid Latitude climate resulting into a more pronounced change in temperatures. There is also increased rainfall resulting into flooding and reduced salinity of the ocean. Summers are hotter resulting into droughts that affect the vegetation in this region and even the general life of the people living in this region.