# Essay on Depletion in Ozone Layer

The Earth’s atmosphere is made up of different layers. The layer closest to the surface is called the troposphere which extends from the Earth’s surface up to about 10 kilometres. The ozone layer is located above the troposphere in the stratosphere (10 km to about 50 km high). Stratospheric ozone is Earth’s natural protection for all life forms, shielding our planet from harmful ultraviolet-B (UV-B) radiation. UV-B radiation is harmful to humans, animals, and plant life. The ozone layer is being destroyed by certain industrial chemicals including ozone-depleting refrigerants, halons, and methyl bromide, a deadly pesticide generally used on crops.

Ozone depletion damage gets much worse when the stratosphere is very cold. This has been the case for the past two years, causing extensive ozone depletion. This: past winter, ozone depletion reached the most severe levels ever recorded over the Northern Hemisphere. Western United States ozone levels also continue to drop 3-4 per cent per decade. Even if all of our efforts to stop harmful emissions are successful, the ozone layer is not expected to begin recovery until around 2020 at the earliest.

Ozone depletion occurs in many places in the Earth’s ozone layer, most severely in the polar regions. NOAA scientists have travelled to Antarctica to study the ozone depletion that has been occurring there since the late 1970s. In 1986, soon after the reported discovery of the ozone hole, Aeronomy Lab (now ESRL) scientist Dr. Susan Solomon led a team of 16 scientists, reached to the conclusion that human-produced trace gases containing chlorine and bromine were causing the ozone hole.

This unique record from the South Pole station clearly shows the annual development of the springtime Antarctic ozone depletion over

the past two decades. Ozone depletion at the South Pole can also be viewed from another perspective through the images created from data collected by the NASA TOMS satellite, and the NOAA. SBUV-2 instruments aboard NOAA satellites. Continued surveillance is necessary in order to verify the expected recovery of the ozone layer.

Arctic Ozone

Significant depletion also occurs in the Arctic ozone layer during the late winter and spring period (January – April). However, the maximum depletion is generally less severe than that observed in the Antarctic, with no large and recurrent ozone hole taking place in the certain industrial processes and consumer products result in the atmospheric emission of ozone-depleting gases. These gases contain chlorine and bromine atoms, which are known to be harmful to the ozone layer. These gases eventually reach the stratosphere, where they are broken apart to release ozone-depleting chlorine atoms.

Methyl bromide, is another important area of research for NOAA scientists. Primarily used as an agricultural fumigant, it is also a significant source of bromine to the atmosphere. Although some ozone-depleting gases also are emitted from natural sources, emissions from human activities exceed those from natural sources. NOAA researchers regularly measure ozone-depleting gases in the lower and upper atmosphere and attempt to account for observed changes. As a result of international regulations, ozone-depleting gases are being replaced in human activities with ‘ozone-friendly’ gases.

The world’s population is a stakeholder in decisions that limit the emissions of ozone-depleting gases. In 1987, the international community put in place a treaty known as the Montreal Protocol on substances that Deplete the Ozone Layer. Since that initial treaty

was ratified, periodic assessments and updates have been conducted. The Protocol success has derived in part from these scientific updates on the science and observation of ozone depletion made over the past 15+ years. NOAA researchers from several laboratories have participated in all of these scientific updates and have also been active in preparing outreach documents to communicate the science of ozone depletion to the public.