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The ozone layer and ozone depletion

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Ozone depletion over Europe

The Effect of Ozone Depletion in the Stratosphere over Populated Regions of the Northern Hemisphere

Over the whole region, total ozone is 3 to 4% lower than it was in the mid-1970s but is increasing slowly (at about 1%/decade).

The reduction in ozone is calculated to result in a similar sized increase in UV-B reaching the Earth's surface.

To put that into context, it would be equivalent to moving house a few hundred kilometres south. Examples of the sort of moves are shown on the map:

- Amsterdam to Luxembourg
- Belfast to Cork
- Bologna to Roma
- Brussels to Strasbourg
- Edinburgh to Manchester
- Hannover to Mannheim
- Oslo to Göteborg
- Paris to Genève

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More information

If ozone is depleted over polar regions, even in the Arctic, there is no direct effect on ozone over populated regions of the Earth's surface such as the temperate Northern hemisphere. Most ozone in the stratosphere is generated near to the equator, effectively isolating the northern from the southern hemisphere. This means that the Antarctic Ozone Hole, where half of the stratospheric ozone is temporarily lost for two months of each year, does not affect the Northern hemisphere. If ozone were to be lost in the Arctic then ozone poor air would circulate afterwards through the stratosphere and mix with ozone rich air from the tropics, diluting it.
Recent analyses of ozone data have confirmed the general long term trend in the Northern hemisphere: there has been a statistically significant decline in total ozone in all seasons with larger reductions in winter and spring than in summer and autumn.

Starting from the early 1990s, a change in this trend is apparent. The record low values in 1992/93, that followed the eruption of Mt. Pinatubo, where 6% lower than those around 1980. Subsequently, ozone values have increased slowly and, over the whole region from 60°N to 60°S, total ozone is now 3 to 4 % lower than in the 1970s [1].

This reduction in ozone is calculated to result in a similar sized increase in UVB reaching the Earth's surface. To put the increase into context, it would be equivalent to moving house permanently a few hundred kilometres south (based on the change in strength of sunlight, which does not always reflect a change in temperature).

Examples of the sort of move:

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- Paris to Genève

Source

1. Scientific Assessment of Ozone Depletion: 2014, World Meteorological Organization (WMO) Global Ozone Research and Monitoring Project Report No. 55, WMO, Geneva, 2014.