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A REVIEW OF SURFACE OZONE BACKGROUND LEVELS AND TRENDS

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A survey of the literature was conducted to review historical and current surface ozone data from background stations in Canada, United States and around the world for the purpose of characterizing background levels and trends. Annual median ozone levels at Canadian background stations currently fall between 23-34 ppb, a range similar to that reported for low elevation background stations in the United States and around the world. Comparisons of ozone levels with those measured over a century ago indicate that current levels have increased by approximately two times. Although current trends are not uniform, there is some indication that background ozone levels over the midlatitudes of the Northern Hemisphere have continued to rise over the past three decades, and that this rise has been in the range of approximately 0.5-2% per year. Rising trends were steeper in the 1970s and 1980s compared to the 1990s, which have seen either a leveling off or a decline in the magnitude of these trends. Model sensitivity studies indicate that the rise in NOx emissions account for the greatest increase in background ozone levels over the past three decades. A substantial component of the background ozone concentration in western North America may be due to long-range transport of Asian pollution, especially during the spring months. Model projections using IPCC emission scenarios for the 21st century indicate that background ozone may rise to levels that would exceed internationally accepted environmental criteria for human health and the environment.