

I. Introduction

The intercontinental transport of photochemical pollution currently is attracting considerable interest. There are increasing indications that chemical pollutants, even compounds with reasonably short lifetimes, can be detected at great distances from their sources. The interest in the problem is further heightened by questions regarding how long-range transport may change with climate variability.

Previous studies carried out within the framework of the International Global Atmospheric Chemistry Project (IGAC) have documented that photochemical pollution can be transported into the remote atmosphere. However, no attempts have been made to systematically consider the complexities of chemical transformations over intercontinental scales or to quantify, beyond reporting isolated events, the amounts of these short-lived compounds that are transported over these distances. The challenge of doing this is great. The short-lived pollutants are highly variable in space and time, even in the remote atmosphere. Field measurements must investigate this variability in sufficient detail so that the controlling chemical and meteorological processes are correctly identified and quantified. Monitoring must determine trends and identify sources. Models must correctly capture the variability and decipher the trends.

In order to effect this systematic study, a coordinated international research program is required. The goal of this program is to provide a better understanding of the intercontinental transport and chemical transformation (ITCT) of anthropogenic pollution and to assess the consequences of this pollution. The aim of this white paper is to present the historical context of the issues, to indicate how the required research fits into the IGAC framework, and to outline a plan for development of an IGAC research activity.