

# 1. Introduction

Human activities have become a major factor that significantly affects the global environment. Since the beginning of industrialization, mankind has increasingly used land, water, minerals, and other natural resources, and future growth in the population and economy will further enhance the impact upon the Earth. Global climate, biogeochemical processes, and natural ecosystems are closely linked with one another, and changes in any one of these systems may affect the others, which could result in consequences detrimental to humans and other living organisms on the Earth. Gaseous and particulate matters produced by man and emitted into the atmosphere have modified the energy balance in the atmosphere and thus effect interactions among the atmosphere, hydrosphere, and biosphere. Nevertheless, mankind still does not sufficiently understand the chemical composition of the atmosphere and its relationship with the hydrosphere and biosphere. Most of the uncertainties in chemistry of the atmosphere and oceans come from the lack of observation data.

The World Meteorological Organization (WMO) started the Global Atmosphere Watch (GAW) programme in 1989 to promote systematic and reliable observation of the global environment, including greenhouse gases (CO<sub>2</sub>, CH<sub>4</sub>, CFCs, N<sub>2</sub>O, etc.) and other gases (e.g., CO, NO<sub>x</sub>, and SO<sub>2</sub>) in the atmosphere. In October 1990, the WMO established the World Data Centre for Greenhouse Gases (WDCGG) at the Japan Meteorological Agency (JMA) in Tokyo as a central facility for the GAW programme to collect, archive, and distribute data for greenhouse and related gases in the atmosphere and oceans. The WDCGG collects data from a number of observation sites worldwide that are involved in GAW and other research programmes (Appendix: LIST OF OBSERVING STATIONS). The WDCGG analyzes changes in concentrations of greenhouse and other gases on various scales of time and space based on collected data, an important function of the centre. Analytical results are summarized in its regular publication, *Data Summary* (Appendix: LIST OF WMO WDCGG PUBLICATIONS), and distributed to data contributors and other users concerned.

The WMO GAW Scientific Advisory Group (SAG) on Greenhouse Gases suggested at its first session in February 1999 that the WDCGG might lessen its analyses on trends and variations in concentrations of greenhouse gases for respective reporting stations. The WDCGG has therefore decided to change its basic idea of analysis and to shift its emphasis for documenting global trends. The structure of *Data Summary* has then been largely revised in the present issue to reflect SAG's suggestion. It is hoped that *Data Summary* will serve as a useful reference for research development and policymaking to cope with global environmental issues that include global warming, depletion of the ozone layer, and acid rain. The WDCGG welcomes comments and suggestions concerning its publications like *Data Summary* and other related matters, which individuals are invited to send, preferably in English, to the WDCGG at the following address:

Mailing address: WMO World Data Centre for Greenhouse Gases (WDCGG)  
c/o Japan Meteorological Agency  
1-3-4, Otemachi, Chiyoda-ku, Tokyo 100-8122, Japan

E-mail: wdcgg@hq.kishou.go.jp

Telephone: +81-3-3211-4966

Facsimile: +81-3-3211-4640

Note:

Analyses in this publication are based on observation data reported from observation sites. Please note that there are provisional data that are not fully quality-controlled and that may be revised in the future.

The WDCGG owes contributing organizations and individual researchers for providing their observation data and thus requests that data users refer to the contributors of the data appropriately. Data are most properly referred to by citing the contributor (Appendix: LIST OF CONTRIBUTORS) and acknowledging the data source. The following is an example of a citation:

Tans, P., K. Thoning, and L. Waterman, 2000. Atmospheric CO<sub>2</sub> monthly mean concentration, Point Barrow. In: WMO WDCGG DATA SUMMARY (WDCGG No. 22), JMA, Tokyo, 19.