Preface

This report is one of a series of operations reports written for the United States National Science Foundation (NSF) Office of Polar Programs, Ultraviolet Spectroradiometer Network, now in its 14th year of operation. The report is intended to complement Volume 10.0 network data that have been measured in 2000 and 2001. Like the Operations Reports of Volume 7 – 9 , this report is also made available in pdf-format on our website www.biospherical.com.

The ozone hole in the austral fall of 2000 was very unusual, and this can clearly be seen in UV data of Volume 10.0. After a particularly rapid growth during August, the ozone hole reached the largest size on record with an extent of close to 30 million km^2 on September 9, 2000. In early October , it was also the deepest with ozone losses exceeding 50% within most of the area of the ozone hole when compared to the pre-ozone-hole conditions. The hole in 2000 grew three weeks earlier than in 1999 and reached its peak one week earlier than in 1999. Its edge was located above southern South America several times in September and October, leading to record UV levels at Ushuaia (see Section 7.4.). After October 20, 2000, the ozone hole begun a very rapid, sustained decrease in size, closing between November 20 and 25. UV levels observed at McMurdo in September 2000 were amongst the highest on record for this month, but dropped to the lowest on record in late October and November (Section 7.1). A similar pattern was observed at the South Pole (Section 7.3)

The methods used for data processing were essentially the same as implemented for Volumes 7 – 9. Daily doses (i.e. dose-rates integrated over 24-hour time periods) were first introduced in Volume 9. The time series were extended, and doses published on the Volume 10.0 CD-ROM include also data measured prior to the Volume 10 period. This allows analyzing the variation of UV radiation observed during several years by opening only one database.

In order to reduce the number of data media, measured solar spectra ("Composite Scans") were compressed and are stored in zip-format on the Volume 10.0 CD-ROM. Decompression tools for Microsoft Windows® Operating Systems are available on the CD, and programs for almost all currently used Operating Systems can be readily obtained via the Internet. See the CD-ROM directory "UNZIP" for more information.

Section 7.9 of this report ("Factors Affecting UV Radiation") was completely revised and now gives a comprehensive overview of all factors affecting UV radiation at the ground such as solar zenith angle, total column ozone, clouds, surface albedo, aerosols, and altitude. A new paragraph about the effect of the "cosine error" on published data was added to the introduction to Section 5, and more information can be found on the "Presentations" section of our website.

We would again like to express our appreciation to all researchers that have utilized and published data from the NSF UV Network (see Appendix Section A2. "References"). We are always looking for publication references in which the network's data have been used. We are especially grateful to those who offered feedback on methods, algorithms, and data products. We continue to encourage this input and welcome suggestions on how we can further meet the needs of the scientific community. An easy-to-use feedback form can be found on our website.

To contact Biospherical Instruments Inc.:

5340 Riley Street
San Diego, CA 92110-2621
Phone: (619) 686-1888
Fax: (619) 686-1887
www.biospherical.com

For project data inquiries, please send an e-mail to *nsfdata@biospherical.com*

Acknowledgements

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Garry Harris from Research Instrument Systems was commissioned by NSF/OPP in the fall of 1987 to design and build the precursor to the SUV-100. Four instruments were manufactured between October 1987 and January 1988, and two were deployed at McMurdo Station and the South Pole in February 1988. In the original configuration no publishable data were produced by the two instruments, and both were substantially redesigned by Biospherical Instruments Inc. during the following season.

Key Contributors

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We gratefully acknowledge the operators who keep our instruments running under the most adverse of conditions on Earth – without them, this project would not be possible. McMurdo operators for this period include Gary Miller and Glenn Grant. The installation at Palmer Station was operated by John Booth, Joe Pettit, and Orion Carlisle. South Pole operators for the period of this report include Daren Blythe and Dana Hrubes. All operators were affiliated with ASA and/or RPSC.

Susana Díaz of CONICET manages Ushuaia's operation, with assistance of G. Deferrari. Dr. E. Olivero, the current director of CADIC, provides facilities and personnel support. Former director Dr. J. Rabassa made this installation possible.

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Personnel at Biospherical Instruments

The Principal Investigator for the project is C.R. ("Rocky") Booth, the Chief Executive Officer and Research Director of Biospherical Instruments Inc. The Co-Principal Investigator is Dr. Germar Bernhard, an Atmospheric Physicist and UV researcher who joined us from the Fraunhofer Institute for Atmospheric Environmental Research (IFU) of Garmisch-Partenkirchen, Germany. He is responsible for quality control and scientific analysis of data from the network. The Project Manager is James ("Jim") C. Ehramjian, and he is responsible for the project's operational activities. Vi Quang and Stuart Lynch joined the group in 1999 as Data Analysts/Database Administrators performing data analysis, database development, programming, and website development.