

## 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 15<sup>th</sup> year of operation. The report is intended to complement Volume 11.0 network data that have been measured in 2001 and 2002. Like the Operations Reports of Volume 7 – 10, this report is also made available in pdf-format on the project's website at [www.biospherical.com/NSF](http://www.biospherical.com/NSF).

The “ozone hole” in the austral fall of 2001 was one of the largest and deepest on record. Ozone levels below 200 DU were observed over the Antarctic continent until 12/7/01. This contrasts the situation in 2000, when a very rapid and sustained decrease of the ozone hole area started in October. The large level of depletion and long duration of the 2001 ozone hole lead to substantially increased UV levels at McMurdo and South Pole at the end of November and the first week of December. For example, the erythemal dose measured at the South Pole on December 5, 2001 was about 50% higher than the long-term average for this day, calculated from measurements taken between the years 1991 – 2000. Similar increases were observed at McMurdo. At Palmer Station, erythemal UV doses increased by up to a factor of six between November 28, 2001 and December 1, 2001. See Section 7 for a more detailed discussion.

The methods used for data processing were essentially the same as implemented for Volumes 7 – 10, with one exception: a new method for calculating the position of mercury lines in wavelength scans was implemented, which lead to more consistent determination of the positions than the method employed previously. Daily doses (i.e. dose-rates integrated over 24-hour time periods) were first introduced in Volume 9.0. The time series were extended to include also daily doses from Volume 11.0.

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 11.0 CD-ROM. Decompression tools for Microsoft Windows<sup>®</sup> 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.

We want to emphasize that a new data version of the entire data set of the NSF UV Monitoring network is currently being generated. This new data set is named “Version 2” and will eventually supersede the “Version 0” data set discussed in this report. Version 2 data are corrected for the instruments’ cosine errors, wavelength errors, which mostly affected earlier network data, and step changes caused by modifications to the instruments. Version 2 data therefore have a higher accuracy than Version 0 data. They also feature a larger number of data products, such as total column ozone, effective albedo, and cloud optical depth. In addition, each measured UV spectrum is complemented with a model spectrum that has been calculated with a radiative transfer model. These model spectra are required for the various corrections and also serve as reference clear-sky spectra during cloudy conditions. More about the new Version 2 data set can be found at the Version 2 website at [www.biospherical.com/NSF/Version2](http://www.biospherical.com/NSF/Version2).

We would 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 the project’s website at [www.biospherical.com/NSF](http://www.biospherical.com/NSF).

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## Acknowledgements

The need for the rapid establishment of the UV monitoring program was identified by Dr. Peter Wilkniss, Director, Division of Polar Programs, National Science Foundation in 1987. Dr. Polly Penhale (NSF) and Dr. Sue Weiler (NSF/OPP Consultant) have guided this project.

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 Glenn Grant and Laura Tudor. The installation at Palmer Station was operated by Orion Carlisle and John Booth. South Pole operators for the period of this report include Dana Hrubes and Daren Blythe. All operators were affiliated with 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.

NOAA/CMDL personnel Glen McConville, Don Neff, and Dan Endres generously provide assistance in the operation of the Barrow system. Dale Stotts of the Ukpeagvik Inupiat Corporation (UIC), and Dr. J. Kelly and J. Sonderup of PICO aided in the original establishment of the system.

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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. Ebrahimian, and he is responsible for the project's operational activities. Vi Quang joined the group in 1999 as Data Analyst/Database Administrator performing data analysis, database development, programming, and website development.

