UV Network News

Volume 1, Issue 1 February 2000

Welcome! to *UV Network News*, a newsletter for those involved with the UV-monitoring network operated by the U.S. Environmental Protection Agency (EPA) and the National Park Service (NPS). UV Network News is distributed monthly to provide up-to-date information on UV radiation and effects and on measurement efforts at EPA/NPS and other monitoring sites.

About the EPA/NPS UV network:

EPA and NPS operate a network of Brewer spectrophotometers at locations throughout the U.S. Fourteen of the monitoring sites are located in national parks in conjunction with PRIMENet (Park Research and Intensive Monitoring of Ecosystems Network) measurement efforts. An additional seven sites are located in urban areas. Together, these sites comprise the largest spectral-UV network in the world.

The network data are used for a variety of scientific studies including assessments of the effects of UV on frog populations and other ecosystems, verification of the NOAA/EPA UV Index for predicting human exposure levels, and for monitoring changes to the global environment. The data are available to interested parties via the following web sites:

EPA's Ultraviolet Monitoring Program, UV-Net
http://www.epa.gov/uvnet/

The National UV Monitoring Center home page
http://oz.physast.uga.edu/

The National Park Service PRIMENet page
http://www2.nature.nps.gov/ard/prime/index.htm

Announcing...UV References!

Web Information

The **Internationally Coordinated UV Radiation Page,** located at **http://www.srrb.noaa.gov/UV/test/**, contains material on UV instrumentation and on current monitoring locations around the world. The site is designed to serve both the scientific community and the interested public. It provides links to over 190 UV-related sites, addressing topics such as education, recent measurements, and UV effects.

Human Health Effects

World Health Organization EHC No. 160: Ultraviolet Radiation
An Authoritative Scientific Review of Environmental and Health Effects of Ultraviolet Radiation, with Reference to Global Ozone Layer Depletion. 1994, 352 pages [E], ISBN 9241571608, Order no. 1160160.

Though five years old, this document remains the classic reference on UV human health effects and contains information that is still largely current. The book briefly reviews the physical characteristics of UV and addresses topics ranging from ocular UV effects to special occupational hazards. It offers extensive references to the original scientific studies, but is still fairly readable by the non-medical community. The book is available from

WHO Publications Center USA
49 Sheridan Avenue
Albany, NY 12210
(phone) 518.436.9686, (fax) 518.436.7433
(email) QCORP@compuserve.com

Cost is US $60.30 plus $5.00 postage and handling for the first book in an order (add an additional $1.00 shipping for each additional publication). Payment by American Express, Visa, or Mastercard accepted: provide card holder's name, card number and expiration date, and a signature. Checks should be made payable to WHO Publications Center USA.

More UV references...

Ozone Depletion

World Meteorological Organization Scientific Assessment of Ozone Depletion: 1998. Global Ozone Research and Monitoring Project - Report No. 44. ISBN 92-807-1723-5.

The assessment, which is updated every few years, is the scientific community's consensus statement on ozone depletion. It outlines new discoveries in ozone- and climate-related research and overviews significant advances in scientists' understanding of human impacts on the ozone layer. Influences of chemical composition changes on the radiative balance of Earth's climate are also discussed.

Copies of the report are available from:

United Nations Environment Programme
Ozone Secretariat
P.O. Box 30552
Nairobi, Kenya

or

World Meteorological Organization
Global Ozone Observing Systems (GO_3OS)
P.O. Box 2300
1211-Geneva-2, Switzerland

Effects of UV Radiation

Environmental Effects of Ozone Depletion - 1998 UNEP Assessment.

This assessment represents the scientific community's consensus statement on the effects of ozone depletion and is a good starting point for those interested in UV effects research. The report contains separate chapters on the effects of ultraviolet radiation on human health, terrestrial ecosystems, aquatic ecosystems, biogeochemical cycles, air quality, and materials. Each chapter is about 10 to 15 pages in length and offers numerous references to the current scientific literature.

The assessment is available from

GCRIO User Services
P.O. Box 1000, 61 Rt 9W
Palisades, NY 10964
(phone) 914.365.8930, (fax) 914.365.8922
or by online request at
http://www.gcrio.org/cgi-bin/OnLnDoc/ondocform.pl.

Sun Protection Listserver

EPA's Stratospheric Protection Division maintains a Listserver providing a forum for the discussion of sun protection practices, research about health and ecological effects of UV, news stories about ozone depletion and other UV topics, and notices of upcoming meetings and conferences.

People interested in subscribing to the Sun Protection Listserver should send an email message to hotline@tidalwave.net. In the subject line, please write "Please add me to the Sun Protection Listserver." Kevin Rosseel (rosseel.kevin@epa.gov) of the U.S. EPA is able to answer any questions about this forum.

Skin Cancer Update

One of the potential, and often discussed, impacts of changing UV levels is skin cancer in humans. Human overexposure to ultraviolet radiation has been linked to an increased occurrence of non-melanoma skin cancer, which is among the most frequently diagnosed and rapidly rising forms of cancer in fair-skinned populations. Currently, about 600,000 cases are diagnosed each year in the United States alone. Studies since the mid-1980s also suggest a link between UV and melanoma, a cancer of the pigment cells. Melanoma is a more rare but extremely serious cancer affecting about 17,000 men and 12,000 women in the United States each year. Mortality is as high as 25% for these cases, compared to about a 1% mortality for non-melanoma cancers. Results indicate that melanoma is likely associated with severe sunburn or other acute UV-A or UV-B exposure.

News reports have revealed that Vice President Al Gore underwent excision of basal cell carcinoma of the skin in 1996. A basal cell carcinoma is a type of non-melanoma skin cancer, and is the most common form of skin cancer in the United States. Increased UV exposure due to decreased ozone in recent years is anticipated to result in an extra 100,000 cases of non-melanoma skin cancer cases per year by the middle of the twenty-first century.

Although the exact impacts of ozone depletion and increased UV-B on human health have been difficult to assess, it has been estimated that depleted ozone levels through 2075 could lead to an additional 154 million cases of skin cancer and an additional 3.4 million deaths. *(continued on page 4)*

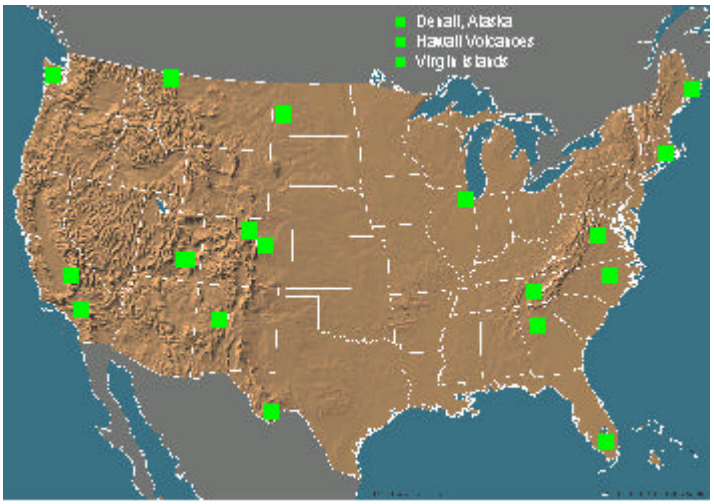
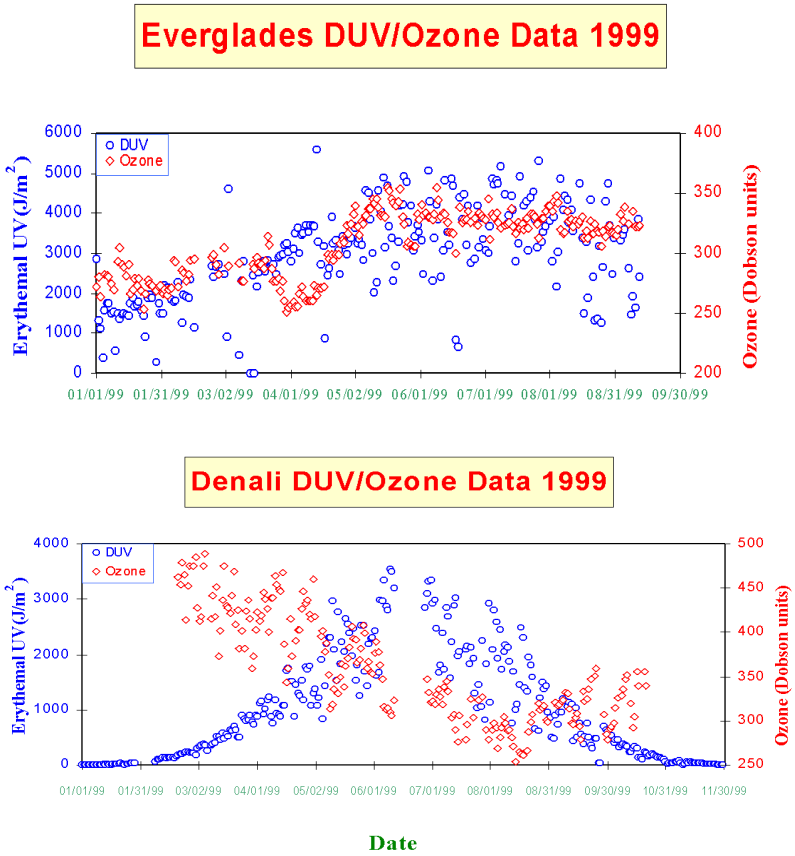


Figure 1. EPA/NPS UV monitoring sites. Locations include •Atlanta, Georgia •Boston, Massachusetts (no longer active) •Boulder, Colorado •Bozeman, Montana (no longer active), •Chicago, Illinois, •Gaithersburg, Maryland •Research Triangle Park, North Carolina •Riverside, California and National Park sites at •Acadia , Maine •Albuquerque, New Mexico •Bigbend, Texas •Canyonlands, Utah •Denali, Alaska •Everglades, Florida •Glacier, Montana •Great Smoky Mountain, Tennessee •Hawaii Volcanoes •Olympic, Washington •Rocky Mountain, Colorado •Sequoia, California •Shenandoah, Virginia •Theodore Roosevelt, North Dakota and •Virgin Islands. http://oz.physast.uga.edu/docs/sites.htm.

EPA/NPS UV Measurements

Measurements from the 21 EPA/NPS UV monitoring sites shown in Figure 1 provide important information about ultraviolet radiation and ozone. The following plots illustrate the differences in observations at Everglades National Park in Florida (25.39°N) and Denali National Park in Alaska (63.73°N). Ozone amounts (shown in red) are generally higher at high latitudes. By August 1999, however, ozone values at Denali were observed to decrease to almost half of the springtime values. Similarly, erythemal UV levels at Denali exhibit a strong seasonal cycle associated with the sun's position at summer and winter solstice.



Skin Cancer Update

(continued from page 2)

More information about UV effects on human skin is available from several sources, including the following professional journals:

- *The Journal of Photochemistry and Photobiology A: Chemistry* examines both quantitative and qualitative aspects of photochemistry, including investigations of photochemical reactions and atmospheric photochemistry. *B: Biology* addresses various aspects of photobiology, including DNA repair, environmental photobiology, photocarcinogenesis and photomedicine, spectroscopy of biological systems, and UV and visible radiation effects.
- *Photodermatology, Photoimmunology, & Photomedicine* is the official publication of the Photomedicine Society. This journal discusses the effects of electromagnetic radiation (ultraviolet, visible and infrared) on the human skin. Topics include aging, carcinogenesis, pigmentation, photosensitivity, immunology, instrumentation and optics, lasers, and photodynamic therapy.
- *British Journal of Dermatology* is published monthly by the British Association of Dermatologists and the Netherlands Association for Dermatology Venerology. Article topics cover a range of issues related to the biology and pathology of the skin.
- *Journal of the American Academy of Dermatology* is known internationally as the leading journal in the field. The JAAD is dedicated to the clinical and continuing education needs of the dermatologic community. Topics relate to the prevention, diagnosis, and treatment of disorders of the skin, including skin cancers and melanoma.

Recent UV News

Low ozone amounts: On November 30, 1999, the European Space Agency's ERS-2 satellite detected abnormally low ozone levels above the United Kingdom, Belgium, the Netherlands, and Scandinavia. The amounts were almost 33% below normal values and were nearly as low as the levels typically reported in the Arctic. "Mini-ozone holes" such as this have been reported previously (in 1997, for example) and are of increasing scientific and political interest. For additional information, see the ESA press release at http://subs.esa.int:8830/pressows/documents/news/1/1999/press47.html.

Ozone field campaign: A four-month field campaign involving over 200 researchers from the U.S., Canada, Europe, Russia, and Japan is underway in the Arctic. The campaign is part of the SAGE III Ozone Loss and Validation Experiment (SOLVE) and is the largest and most comprehensive field experiment to occur in this region. The experiment will use a NASA DC-8 aircraft to fly several 8- to 10-hour missions over the Arctic region. Each mission will cover about 4,000 miles and obtain data on clouds, ozone, water vapor, particulates, and chemical species at various altitudes. More information is available from the University of Colorado at Boulder web site http://www.colorado.edu/PublicRelations/NewsReleases/1999/404.html.

In next month's newsletter...

Biologically effective UV,
UV and amphibians, and more...

Your contributions or suggestions are always welcome!

UV Network News is a monthly newsletter for persons involved in UV monitoring and research. The newsletter is produced by the Cooperative Institute for Research in Environmental Sciences at the University of Colorado and supported by the National Park Service, PRIMENet, and the Surface Radiation Research Branch of NOAA's Air Resources Laboratory.
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