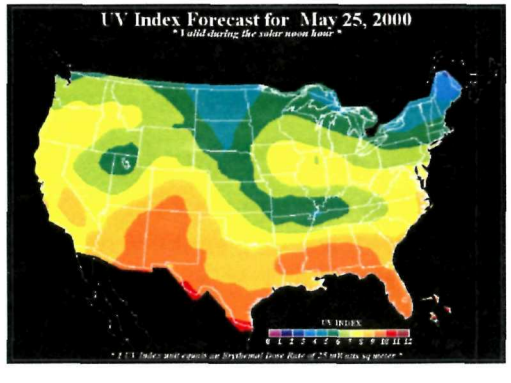
PROTECTING YOUR SKIN

The National Oceanic and Atmospheric Administration and the U.S. Environmental Protection Agency currently provide next day forecasts of the **UV Index** for 58 cities in the U.S. The UV index is an estimate of the amount of skin-damaging radiation expected to reach the earth's surface at the time the sun is highest in the sky. Values range from 0 to 16; typical numbers and the recommended protections are listed below.

0-2	minimal	*hat*
3-4	low	*hat, sunscreen*
5-6	moderate	*hat, sunscreen, shade*
7-9	high	*all the above, stay indoors during peak hours*
10+	very high	*stay indoors when possible*



Map of the UV Index forecast for May 25, 2000. Day-to-day values for a region may vary greatly. From NOAA/EPA.

The National Park Service and U.S. Environmental Protection Agency: Partners in Monitoring UV

In 1996, the National Park Service and the U.S. Enviromental Protection Agency established the Park Research and Intensive Monitoring of Ecosystems Network (PRIMENet). PRIMENet provides long-term monitoring of visibility, ground-level ozone, atmospheric particulates, UV radiation, and meteorological conditions.

PRIMENet stations have been set up at 14 national parks, including Acadia, Big Bend, Canyonlands, Everglades, Denali, Glacier, Great Smoky Mountains, Hawaii Volcanoes, Olympic, Rocky Mountain, Sequoia-Kings Canyon, Shenandoah, Theodore Roosevelt, and Virgin Islands. These parks are home to many major ecosystems and have also been designated as Class-1 air quality parks. The U.S. Congress established this air quality classification to aid in maintaining and improving air quality in these areas.

PRIMENet measurements are shared with the U.S. Geological Survey, the U.S. Department of Agriculture, and several universities for use in tying atmospheric changes to ecosystem responses. Changes in human health, plants, aquatic ecosystems, and other species have already been documented and may be directly related to changes in UV. Monitoring these amounts, in coordination with studies of the affected ecosystems, can help scientists better understand the ecosystems' response to changing UV levels.

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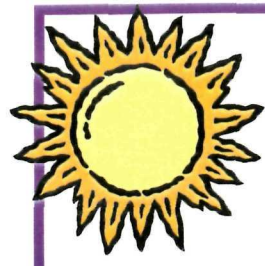


UV and Skin Cancer

Produced by the University of Colorado and NOAA's Air Resources Laboratory in collaboration with the National Park Service and PRIMENet.

UV RADIATION

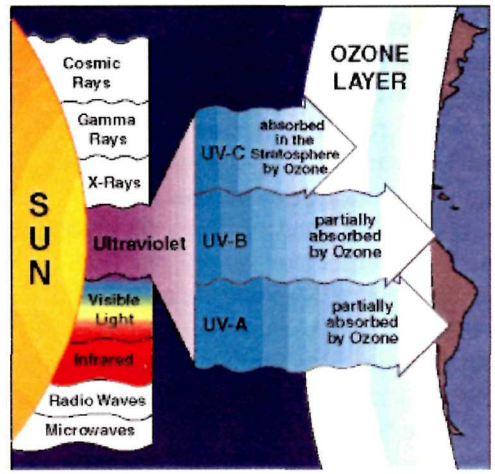
Ultraviolet (UV) radiation from the sun is absorbed by DNA in plants and animals on earth. In small doses, UV radiation initiates the production of vitamin D to build and maintain our bones. In larger doses, UV can have very negative impacts.

Much of the UV radiation reaching earth is absorbed by stratospheric ozone, located in a layer of the atmosphere about 10-50 kilometers above the earth's surface. In recent decades, the amount of stratospheric ozone has been decreasing. This reduction in ozone is responsible for the "ozone hole" discovered above Antarctica in the early 1980s, and is due largely to chemical reactions of human-made substances called chlorofluorocarbons (CFCs) in the stratosphere.

In recent years, ozone losses have been observed over the northern mid-latitudes, home to large numbers of the world's population. Between 1979 and 1998, ozone levels over these locations showed decreases on the order of 6 to 8%. In the Arctic, ozone amounts have been as much as 25 to 40% below the values reported in the 1960s and early 1970s.

EFFECTS ON HUMAN SKIN

Decreases in the amount of stratospheric ozone mean that more UV radiation may be able to reach the earth's surface. The human skin has developed various defense mechanisms to counteract the effects of increased UV exposure, including thickening the outer layer (the epidermis), and developing darker coloring and pigmentation to shade more vulnerable and deeper cells. Despite these natural protections, UV exposure can result in molecular damage to cells as well as an inability to repair this damage.



UV radiation comes from the sun. UV-C wavelengths are the shortest UV wavelengths and are mostly blocked by ozone in the stratosphere. UV-B and UV-A radiation are only partially blocked by ozone. A decrease in ozone allows more UV-B and UV-A radiation to reach the earth's surface.

SKIN CANCER FACTS

UV overexposure 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.

Almost 1,000,000 cases of non-melanoma skin cancer are diagnosed each year in the United States alone. Increased UV exposure due to decreased ozone in recent years is expected to result in an extra 100,000 cases by the middle of the twenty-first century.

A more rare, but extremely serious, threat from increased UV is melanoma, a cancer of the pigment cells. Melonoma affects about 17,000 men and 12,000 women in the United States each year. Mortality is as high as 25% for these cases, accounting for 75% of all skin cancer deaths.

Studies since the mid-1980s have suggested that melanoma is likely associated with a severe sunburn or other acute UV-B or UV-A exposure.