

Description of Version 2 Data Format NSF UV Monitoring Network: Daily Dose

Filename: **SITE_all**_DailyDose_**no_flags**.csv

where **SITE** is MCM for McMurdo Station, Antarctica
 PAL for Palmer Station, Antarctica
 SPO for South Pole, Antarctica
 USH for Ushuaia, Argentina
 SAN for San Diego, California
 BAR for Barrow, Alaska
 SUM for Summit, Greenland

all indicates that file includes data of all volumes

no_flags indicates that daily doses were calculated only from data that haven't been flagged for poor quality.

This data product was already part of Volume 0, and is known as "Daily Dose Database". The format of the Version 2 style Database 3 is similar to the original version but provides more data products.

Daily Doses were calculated by integrating dose-rates over 24 hours. Gaps in data were filled by interpolation using an algorithm described in Section 4.2.4 of the 2004-2005 Operations Report, available at: http://www.biospherical.com/nsf/report_0405/CHAPTER4.PDF.

Column Assignment

Label	Description	Unit	Remark
Date	Date and time assigned to daily dose values	Days since 1-Jan-1900	1
Site	1=McMurdo; 2=Palmer; 3=South Pole; 4=Ushuaia; 5=San Diego; 6=Barrow; 7=Summit		
Volume	Volume label; ".2" indicates Version 2		
Minimum_Zenith	Minimum solar zenith angle occurring during solar scans of the integration period.	degree	2
Maximum_Time_Gap	Maximum time gap in solar measurements during the integration period	seconds	3
E290-315	Daily dose for the spectral integral 290 - 315 nm	kJ/m ²	
E290-320	Daily dose for the spectral integral 290 - 320 nm	kJ/m ²	
E320-340	Daily dose for the spectral integral 320 - 340 nm	kJ/m ²	
E340-400	Daily dose for the spectral integral 340 - 400 nm	kJ/m ²	
E315-400	Daily dose for the spectral integral 315 - 400 nm	kJ/m ²	
E320-400	Daily dose for the spectral integral 320 - 400 nm	kJ/m ²	
E315-360	Daily dose for the spectral integral 315 - 360 nm	kJ/m ²	
E320-360	Daily dose for the spectral integral 320 - 360 nm	kJ/m ²	
E340-360	Daily dose for the spectral integral 340 - 360 nm	kJ/m ²	
E360-400	Daily dose for the spectral integral 360 - 400 nm	kJ/m ²	
E400-600	Daily dose for the spectral integral 400 - 600 nm	kJ/m ²	
E289.855-294.118	Daily dose for the spectral integral 289.855 - 294.118 nm	kJ/m ²	

E294.118-298.507	Daily dose for the spectral integral 294.118 - 298.507 nm	kJ/m ²	
E298.507-303.03	Daily dose for the spectral integral 298.507 - 303.03 nm	kJ/m ²	
E303.03-307.692	Daily dose for the spectral integral 303.03 - 307.692 nm	kJ/m ²	
E307.692-312.5	Daily dose for the spectral integral 307.692 - 312.5 nm	kJ/m ²	
E312.5-317.5	Daily dose for the spectral integral 312.5 - 317.5 nm	kJ/m ²	
E317.5-322.5	Daily dose for the spectral integral 317.5 - 322.5 nm	kJ/m ²	
E322.5-327.5	Daily dose for the spectral integral 322.5 - 327.5 nm	kJ/m ²	
E327.5-332.5	Daily dose for the spectral integral 327.5 - 332.5 nm	kJ/m ²	
E332.5-337.5	Daily dose for the spectral integral 332.5 - 337.5 nm	kJ/m ²	
E337.5-342.5	Daily dose for the spectral integral 337.5 - 342.5 nm	kJ/m ²	
E342.5-347.5	Daily dose for the spectral integral 342.5 - 347.5 nm	kJ/m ²	
Dose1	Spectral irradiance weighted with erythema action spectrum by <i>Komhyr and Machta, 1973</i>	kJ/m ²	4
Dose2	Spectral irradiance weighted with erythema action spectrum by <i>Diffey, 1987</i>	kJ/m ²	4
CIE	Spectral irradiance weighted with CIE erythema action spectrum (This is the most widely used erythema action spectrum)	kJ/m ²	4
UVIndex	UV Index	10 ⁵ s	4, 5
Erythema_Anders	Spectral irradiance weighted with erythema action spectrum by <i>Anders, 1995</i>	10 ⁵ s /s	4
RBM501	Spectral irradiance weighted with RBM response function	kJ/m ²	4
SetlowBSI	Spectral irradiance weighted with action spectrum for DNA damage by <i>Setlow, 1974</i> ; BSI parameterization	kJ/m ²	4
SetlowBSI_300	Spectral irradiance weighted with action spectrum for DNA damage by <i>Setlow, 1974</i> ; BSI parameterization normalized at 300 nm	kJ/m ²	4
SetlowTUV	Spectral irradiance weighted with action spectrum for DNA damage by <i>Setlow, 1974</i> ; TUV parameterization	kJ/m ²	4
SetlowNDSC	Spectral irradiance weighted with action spectrum for DNA damage by <i>Setlow, 1974</i> ; NDSC parameterization	kJ/m ²	4
SCUP-h	Spectral irradiance weighted with action spectrum for skin cancer in mice corrected for human skin by <i>Grujil et al., 1993</i>	kJ/m ²	4
SCUP-m	Spectral irradiance weighted with action spectrum for skin cancer in mice by <i>Grujil et al., 1993</i>	kJ/m ²	4
Caldwell	Spectral irradiance weighted with action spectrum for generalized plant response by <i>Caldwell, 1971</i>	kJ/m ²	4
Flint	Spectral irradiance weighted with action spectrum for plant growth by <i>Flint and Caldwell, 2003</i>	kJ/m ²	4
Hunter	Spectral irradiance weighted with action spectrum for northern anchovy by <i>Hunter, 1979</i>	kJ/m ²	4

Boucher	Spectral irradiance weighted with action spectrum for inhibition of phytoplankton carbon fixation by <i>Boucher et al.</i> , 1994	(mg C) / (mg chl s) *10 ⁵ s	4
Cullen_phaerodactylum	Spectral irradiance weighted with action spectrum for inhibition of phytoplankton photosynthesis of phaeodactylum by <i>Cullen et al.</i> , 1994	10 ⁵ s	4
Cullen_prorocentrum	Spectral irradiance weighted with action spectrum for inhibition of phytoplankton photosynthesis of prorocentrum by <i>Cullen et al.</i> , 1994	10 ⁵ s	4
Neale_Antarctic	Spectral irradiance weighted with action spectrum for inhibition of photosynthesis by <i>Cullen and Neale.</i> , 1997	10 ⁵ s	4
TSI-weighting	Spectral irradiance weighted with TSI response function	kJ/m ²	4

Remarks

- 1 - Date and time refer to Greenwich Mean Time (GMT) and are encoded into a single number where the integer part is the day number relative to January 1, 1900 (day 1 corresponds to 1/1/1900). The fractional part is the time of day. (For example, the fractional part multiplied with 24 gives the hour of the measurement). Time refers to approximate local solar noon (01:00 for McMurdo Station; 16:00 for Palmer Station; 12:00 for South Pole Station; 17:00 for Ushuaia; 20:00 for San Diego, 21:00 for Barrow, and 15:00 for Summit). Integration boundaries for daily dose calculations are the given time +/- 12 hours. For example: The daily dose for McMurdo assigned to the Date/Time stamp 36826.04167 (i.e. 10/27/00 01:00 GMT) is the integral of spectral irradiance between 10/26/00 13:00 GMT and 10/27/00 13:00 GMT.
- 2 - Solar zenith is the true solar zenith angle, i.e., the angle between the zenith and the Sun if the Earth had no atmosphere. Due to refraction of the Earth's atmosphere, the Sun appears to an observer, who is standing at the surface of the Earth, at a smaller angle.
- 3 - Maximum time gap in solar measurements during the integration period between sunrise and sunset in seconds. If the time-gap is larger than 15000 seconds, no doses are published. Gaps smaller than this limit are filled by spline-interpolation. A description of the procedure can be found in Section 4.2.4 of the 2004-2005 Operations Report, available at: http://www.biospherical.com/nsf/report_0405/CHAPTER4.PDF. **If the gap is larger than 7500 seconds (i.e., approximately two hours), data have to be treated with caution because the interpolated values may deviate significantly from the actual radiation levels.**
- 4 - For parameterization of action spectra see links in document <http://www.biospherical.com/nsf/Version2/description-Version2-Database3.html>
- 5 - UV Index is a unit of measure of UV levels relevant to the effects on human skin. It serves as a vehicle to raise public awareness about the potential detrimental effects on health from solar UV exposure and to alert people of the need to adopt protective measures. The UV index is defined as erythemally (CIE) weighted irradiance, expressed in the units W/m², and multiplied by 40. Note that the UV Index is a dimensionless number. More information can be found here: http://www.biospherical.com/nsf/Solar_Index_Guide.pdf