

Shortname: OMTO3d
Longname: OMI/Aura Ozone (O3) Total Column Daily L3 Global
1x1deg Lat/Lon Grid
PFS Version: 1.0.7.1
Date: 2013 February 16
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PGE Version: 1.0.7
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Description: >

This document specifies the format of the Ozone Monitoring Instrument (OMI) OMTO3d product, which is the daily Level 3 (L3) gridded data product that corresponds to the OMTO3 product. The latter is the total column ozone orbital Level 2 (L2) swath data product of the U.S. OMI Science Team (Reference 1). The "d" at the end of "OMTO3d" represents "daily".

The adopted L3 grid is a 1.0-degree by 1.0-degree grid in longitude and latitude. The dimensions of this grid are 360 by 180. The grid cell at coordinates (1, 1) is centered at (longitude = -179.5 , latitude = -89.5), and the grid cell at coordinates (360, 180) is centered at (longitude = 179.5 , latitude = 89.5). The center of the grid is located at (longitude = 0.0 , latitude = 0.0), and corresponds to the corners of four grid cells.

The adopted L3 grid is consistent with the document entitled "Definition of OMI Grids for Level 3 and Level 4 Data Products" by J.P. Veefkind et al.

(Reference 2).

The values in the OMTO3d data product file for each L3 grid cell are weighted averages of the OMI L2 observations that overlap spatially with the L3 grid cell. The weights are based upon the fractional area of overlap of each L2 observation with the L3 grid cell. The overlap between an L2 observation and an L3 grid cell is determined in a manner consistent with the document entitled "Total Ozone Mapping Spectrometer (TOMS) Level-3 Data Products User's Guide" by R. McPeters et al. (Reference 5).

The L3 product currently excludes L2 data collected in spatial and spectral zoom modes.

The L3 product is stored as one HDF-EOS 5 grid file, and has a size of 0.7 MB.

The format of the L3 product files is consistent with the document entitled "A File Format for Satellite Atmospheric Chemistry Data" by C. Craig et al. (Reference 3).

Global Metadata:

- Metadata Name: EndUTC
Mandatory: T
Data Type: HE5T_NATIVE_CHAR
Number of Values: 1
Data Source: PGE
Description: >
UTC at the end of the L3 granule in "YYYY-MM-

DDT23:59:59.999999Z" format.

- Metadata Name: GranuleDay
Mandatory: T
Data Type: HE5T_NATIVE_INT
Number of Values: 1
Minimum Value: 1
Maximum Value: 31
Data Source: PGE
Description: The day of the month at the start of the L3 granule.

- Metadata Name: GranuleDayOfYear
Mandatory: T
Data Type: HE5T_NATIVE_INT
Number of Values: 1
Minimum Value: 1
Maximum Value: 366
Data Source: PGE
Description: The day of the year at the start of the L3 granule.

- Metadata Name: GranuleMonth
Mandatory: T
Data Type: HE5T_NATIVE_INT
Number of Values: 1
Minimum Value: 1
Maximum Value: 12
Data Source: PGE
Description: The month of the year at the start of the L3 granule.

- Metadata Name: GranuleYear
Mandatory: T
Data Type: HE5T_NATIVE_INT
Number of Values: 1
Minimum Value: 2000
Maximum Value: 2099
Data Source: PGE
Description: The (four-digit) year at the start of the L3 granule.

- Metadata Name: HDFEOSVersion
Mandatory: T
Data Type: HE5T_NATIVE_CHAR

Number of Values: 1

Data Source: HE

Description: >

The version of HDF-EOS 5 used in production. Example is "HDFEOS_5.1.11".

- Metadata Name: InstrumentName

Mandatory: T

Data Type: HE5T_NATIVE_CHAR

Number of Values: 1

Valid: OMI

Data Source: PGE

Description: Actual is "OMI" (see Section 6.1 of Reference 3).

- Metadata Name: OrbitNumber

Mandatory: T

Data Type: HE5T_NATIVE_INT

Number of Values: 1,60

Minimum Value: 1

Maximum Value: 999999

Data Source: L2G

Description: The OMI orbit number for each L2 input granule.

- Metadata Name: OrbitPeriod

Mandatory: T

Data Type: HE5T_NATIVE_DOUBLE

Number of Values: 1,60

Minimum Value: 5000.0

Maximum Value: 7000.0

Data Source: L2G

Description: The Aura orbital period for each L2 input granule.

- Metadata Name: Period

Mandatory: T

Data Type: HE5T_NATIVE_CHAR

Number of Values: 1

Valid: Daily,Weekly,Monthly

Data Source: PGE

Description: The duration of the L3 granule. Actual is "Daily".

- Metadata Name: PGEVersion
Mandatory: T
Data Type: HE5T_NATIVE_CHAR
Number of Values: 1
Data Source: PCF
Description: Example is "1.0.7" (see Appendix K of Reference 4).

- Metadata Name: ProcessLevel
Mandatory: T
Data Type: HE5T_NATIVE_CHAR
Number of Values: 1
Valid: 3
Data Source: PGE
Description: Actual is "3".

- Metadata Name: StartUTC
Mandatory: T
Data Type: HE5T_NATIVE_CHAR
Number of Values: 1
Data Source: PGE
Description: >
UTC at the start of the L3 granule in "YYYY-MM-DDT00:00:00.000000Z" format.

- Metadata Name: TAI93At0zOfGranule
Mandatory: T
Data Type: HE5T_NATIVE_DOUBLE
Number of Values: 1
Minimum Value: 0.0
Maximum Value: 1.0e+30
Data Source: PGE
Description: >

The TAI93 time at 0z of the L3 granule (see Section 6.1 of Reference 3).

Grid Metadata:

- Metadata Name: GCTPProjectionCode
Mandatory: T

Data Type: HE5T_NATIVE_INT

Number of Values: 1

Minimum Value: 0

Maximum Value: 99

Data Source: PGE

Description: >

The GCTP projection code of the L3 grid. Actual is 0, which corresponds

to the geographic projection.

- Metadata Name: GridName

Mandatory: T

Data Type: HE5T_NATIVE_CHAR

Number of Values: 1

Valid: OMI Column Amount O3

Data Source: PGE

Description: Actual is "OMI Column Amount O3".

- Metadata Name: GridOrigin

Mandatory: T

Data Type: HE5T_NATIVE_CHAR

Number of Values: 1

Valid: Center

Data Source: PGE

Description: >

The origin of the L3 grid. Actual is "Center" (see Section 6.2 of Reference 3).

- Metadata Name: GridSpacing

Mandatory: T

Data Type: HE5T_NATIVE_CHAR

Number of Values: 1

Data Source: PGE

Description: >

Spacing of L3 grid (in degrees). Actual is "(1.0,1.0)".

- Metadata Name: GridSpacingUnit

Mandatory: T

Data Type: HE5T_NATIVE_CHAR

Number of Values: 1

Valid: deg

Data Source: PGE

Description: >

Unit for GridSpacing. Actual is "deg".

- Metadata Name: GridSpan

Mandatory: T

Data Type: HE5T_NATIVE_CHAR

Number of Values: 1

Data Source: PGE

Description: >

Span of L3 grid (in degrees). Actual is "(-180,180,-90,90)".

- Metadata Name: GridSpanUnit

Mandatory: T

Data Type: HE5T_NATIVE_CHAR

Number of Values: 1

Valid: deg

Data Source: PGE

Description: >

Unit for GridSpan. Actual is "deg".

- Metadata Name: NumberOfLatitudesInGrid

Mandatory: T

Data Type: HE5T_NATIVE_INT

Number of Values: 1

Minimum Value: 1

Maximum Value: 180

Data Source: PGE

Description: The number of latitude bins in the L3 grid.

- Metadata Name: NumberOfLongitudesInGrid

Mandatory: T

Data Type: HE5T_NATIVE_INT

Number of Values: 1

Minimum Value: 1

Maximum Value: 360

Data Source: PGE

Description: The number of longitude bins in the L3 grid.

- Metadata Name: Projection

Mandatory: T

Data Type: HE5T_NATIVE_CHAR

Number of Values: 1

Valid: Geographic

Data Source: PGE

Description: >

The map projection of the L3 grid. Actual is "Geographic" (see Section 6.2 of Reference 3).

Grid Dimensions:

- Dimension Name: XDim

Data Type: HE5T_NATIVE_INT

Dimension Type: FIXED

Number of Values: 1

Minimum Value: 1

Maximum Value: 360

Data Source: PGE

Description: >

The longitudes dimension of the L3 grid. There are currently 360 1.0-degree-wide bins between longitudes -180.0 and 180.0 degrees.

- Dimension Name: YDim

Data Type: HE5T_NATIVE_INT

Dimension Type: FIXED

Number of Values: 1

Minimum Value: 1

Maximum Value: 180

Data Source: PGE

Description: >

The latitudes dimension of the L3 grid. There are currently 180 1.0-degree-wide bins between latitudes -90.0 and 90.0 degrees.

Data Fields:

- Field Name: ColumnAmountO3
Data Type: HE5T_NATIVE_FLOAT
Dimensions: YDim,XDim
Valid Range: 50.0 to 700.0
Missing Value: -1.2676506e+30
Offset: 0.0
Scale Factor: 1.0
Units: DU
Data Source: L2G
Title: Best Total Ozone Solution
Unique Field Definition: TOMS-OMI-Shared
Description: >
The average total column ozone (in DU) in each L3 grid cell.

- Field Name: RadiativeCloudFraction
Data Type: HE5T_NATIVE_FLOAT
Dimensions: YDim,XDim
Valid Range: 0.0 to 1.0
Missing Value: -1.2676506e+30
Offset: 0.0
Scale Factor: 1.0
Units: NoUnits
Data Source: L2G
Title: Radiative Cloud Fraction = $fc * lc331 / lm331$
Unique Field Definition: TOMS-OMI-Shared
Description: >
The average radiative cloud fraction ($= fc * lc331 / lm331$) in each
L3
grid cell.

- Field Name: SolarZenithAngle
Data Type: HE5T_NATIVE_FLOAT
Dimensions: YDim,XDim
Valid Range: 0.0 to 180.0
Missing Value: -1.2676506e+30

Offset: 0.0
Scale Factor: 1.0
Units: deg
Data Source: L2G
Title: Solar Zenith Angle
Unique Field Definition: TOMS-Aura-Shared
Description: >

The average solar zenith angle (in degrees) in each L3 grid cell.

- Field Name: UVAerosolIndex
Data Type: HE5T_NATIVE_FLOAT
Dimensions: YDim,XDim
Valid Range: -30.0 to 30.0
Missing Value: -1.2676506e+30
Offset: 0.0
Scale Factor: 1.0
Units: NoUnits
Data Source: L2G
Title: UV Aerosol Index
Unique Field Definition: TOMS-OMI-Shared
Description: >

The average UV aerosol index in each L3 grid cell.

- Field Name: ViewingZenithAngle
Data Type: HE5T_NATIVE_FLOAT
Dimensions: YDim,XDim
Valid Range: 0.0 to 70.0
Missing Value: -1.2676506e+30
Offset: 0.0
Scale Factor: 1.0
Units: deg
Data Source: L2G
Title: Viewing Zenith Angle
Unique Field Definition: TOMS-OMI-Shared
Description: >

The average viewing zenith angle (in degrees) in each L3 grid cell.

Core Metadata: >

None.

Product Specific Attributes: >

None.

Archived Metadata: >

None.

References: >

1. "OMTO3 README File"
(April 3, 2012)
(http://disc.sci.gsfc.nasa.gov/Aura/OMI/omto3_v003.shtml)
2. "Definition of OMI Grids for Level 3 and Level 4 Data Products"
(OMI-Grids_L3L4, SD-OMIE-KNMI-443, 25 January 2005)
3. "A File Format for Satellite Atmospheric Chemistry Data"
(OMI-AURA-DATA-GUIDE, Version 1.7, 12 May 2008)
4. "OMI Science Software Delivery Guide for Version 0.9"
(OMI-SSDG-0.9.10, Version 0.9.10, 22 June 2005)
5. "Total Ozone Mapping Spectrometer (TOMS) Level-3 Data Products User's Guide"
(NASA/TM-2000-209896, July 2000)