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Block 2.0.0

Goddard Space Flight Center
Greenbelt, Maryland

National Aeronautics and
Space Administration

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Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Aerosol Products JPSS Review/Approval Page

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Preface

This document is under JPSS Ground ERB configuration control. Once this document is approved, JPSS approved changes are handled in accordance with Class I and Class II change control requirements as described in the JPSS Configuration Management Procedures, and changes to this document shall be made by complete revision.

Any questions should be addressed to:

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Change History Log

Revision	Effective Date	Description of Changes (Reference the CCR & CCB/ERB Approve Date)	Sections Affected
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0200B	Oct 23, 2014	This version incorporates 474-CCR-14-2076 which was approved by the JPSS Ground ERB on the effective date shown.	All
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0200D	Feb 12, 2016	This version incorporates 474-CCR-15-2657, and 474-CCR-16-2777 which was approved by the JPSS Ground ERB on the effective date shown.	All

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List of TBx Items

TBx	Type	ID	Text	Action
None				

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1 Introduction

1.1 Scope

The Joint Polar Satellite System (JPSS) Algorithm Specification for Aerosol Products - Volume II: Data Dictionary contains the specifications for the format of the Aerosol Intermediate Products (IPs) and Environmental Data Records (EDRs). This specification includes the format of the Hierarchical Data Format Release 5 (HDF5) files, as well as the product definitions. These formats are available to external users of the JPSS. For an overview of the data product formats, see 474-00001-01, JPSS CDFCB-X Vol I. For an overview of the metadata formats for data products, see 474-00448-02-01, JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms.

1.2 Organization

Section	Contents
Section 1	Provides information regarding the scope, and organization of this document, as reference material only.
Section 2	Lists parent documents and related documents that were used as sources of information for this document or that provide additional background information to aid understanding of the interface implementations.
Section 3	Provides an overview of the HDF5 UML for the data product types
Section 4	Provides a description of the contents of each JPSS Intermediate Product associated with this algorithm grouping.
Section 5	Provides a description of the contents of each JPSS EDR associated with this algorithm grouping.
Section 6	Identifies the ancillary and auxiliary data needed for the processing associated with this algorithm grouping if applicable.
Section 7	Provides a description of relevant Look-Up Tables (LUTs) and Processing Coefficient Tables (PCTs) associated with this algorithm grouping.
Appendix A	Provides the Data Mnemonic to Interface Mapping for the data products in this volume.
Appendix B	Provides a mapping of the quality flags by sensor and product that are reportable to the associated data product quality flag Test ID used in the processing environment
Appendix C	References 470-00041, JPSS Program Lexicon.
Attachment A	Provides the list of applicable xml files for this Data Dictionary.

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2 Related Documentation

The latest JPSS documents can be obtained from URL: https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm. JPSS Project documents have a document number starting with 470, 472 or 474 indicating the governing Configuration Control Board (CCB) (Program, Flight, or Ground) that has the control authority of the document.

2.1 Parent Documents

The following reference document(s) is (are) the Parent Document(s) from which this document has been derived. Any modification to a Parent Document will be reviewed to identify the impact upon this document. In the event of a conflict between a Parent Document and the content of this document, the JPSS Program Configuration Change Board has the final authority for conflict resolution.

Document Number	Title
474-00448-01-12	JPSS Algorithm Specification Volume I: Software Requirements Specification (SRS) for the Aerosol Products

2.2 Applicable Documents

The following document(s) is (are) the Applicable Document(s) from which this document has been derived. Any modification to an Applicable Document will be reviewed to identify the impact upon this document. In the event of conflict between an Applicable Document and the content of this document, the JPSS Program Configuration Change Board has the final authority for conflict resolution.

Document Number	Title
NPR 7150.2A	NASA Software Engineering Requirements
474-00167	Joint Polar Satellite System (JPSS) Common Ground System (CGS) Requirements Document
474-00005	Joint Polar Satellite System (JPSS) Government Resource for Algorithm Verification, Independent Testing, and Evaluation (GRAVITE) Requirements Document
N/A	Hierarchical Data Format, Version 5 (HDF5), http://www.hdfgroup.org/HDF5/

2.3 Information Documents

The following documents are referenced herein and amplify or clarify the information presented in this document. These documents are not binding on the content of this document.

Document Number	Title
D0001-M01-S01-020	Joint Polar Satellite System (JPSS) VIIRS Aerosol Optical Thickness (AOT) and Particle Size Parameter Algorithm Theoretical Basis Document (ATBD)
D0001-M01-S01-019	Joint Polar Satellite System (JPSS) VIIRS Suspended Matter Algorithm Theoretical Basis Document (ATBD)
474-00333	Joint Polar Satellite System (JPSS) Ground System (GS) Architecture Description Document (ADD)

Document Number	Title
474-00054	Joint Polar Satellite System (JPSS) Ground System (GS) Concept of Operations (ConOps)
470-00041	Joint Polar Satellite System (JPSS) Program Lexicon
ISO/IEC 10646	ASCII Standard, the Corresponding International Standards Organization (ISO) standard
474-00001-01	Joint Polar Satellite System (JPSS) Common Data Format Control Book, Vol I - Overview
474-00448-02-01	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Common Algorithms

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3 UML for HDF5 Products

The following paragraphs describe the structure and contents of the IP and EDR granules formed by the JPSS ground processing software.

3.1 Intermediate Products and Environmental Data Records HDF5 Details - Statically Sized

Figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, depicts the HDF5 IP/EDR organization as a Unified Modeling Language (UML) class diagram. Each HDF5 IP/EDR file contains an HDF5 Root Group, '/', a Data Products Group, Product Groups (Collection Short Name), an optional Geolocation Group (depending upon packaging option, see the JPSS CDFCB-X Vol. I, for a description of the geolocation packaging), and an All Data Group (dataset arrays). The Product Groups and Geolocation Group both contain datasets - an Aggregation Dataset (Collection Short Name_Agg) and Granule Datasets (Collection Short Name_Gran_n) - where n indicates the nth granule in a temporal aggregation of granules (1 .. n). A granule is a general term used to describe the minimum quanta of data collected per processing period, generally on the order of seconds. For the definition and organization of the metadata attributes contained in the HDF5 files, see the JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms (474-00448-02-01) - Metadata. Attributes that are specific to a particular IP/EDR are listed with the specific IP/EDR's data format definition. For the generalized formats and packaging options for the Geolocation data, see the JPSS CDFCB-X Vol. I - Overview.

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

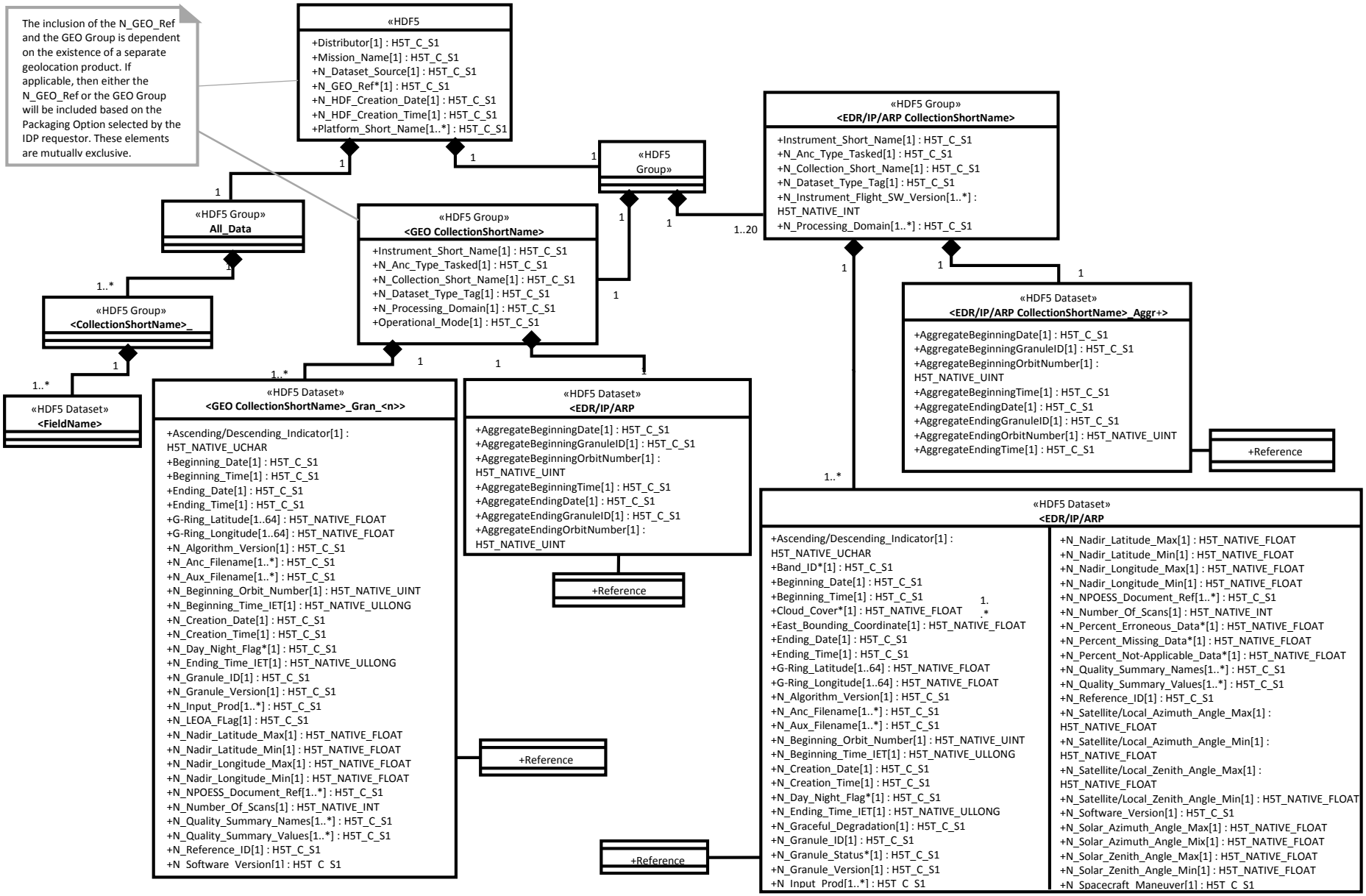

Figure: 3.1-1 Generalized UML Diagram for statically sized HDF5 IP/EDR Files

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

3.2 Intermediate Products, Application Related Products and Environmental Data Records HDF5 Details - Dynamically Sized

Figure 3.2-1, Generalized UML Diagram for dynamically sized HDF5 IP/EDR Files, depicts the HDF5 IP/EDR organization as a Unified Modeling Language (UML) class diagram for products that contain dynamically sized fields. Dynamically sized means that a field's length will vary from granule to granule. The organization of the HDF5 file is identical to the statically sized HDF5 file with the exception of the aggregation and corresponding All_Data group.For statically sized products, the object ID stored in the aggregation array points to a Dataset_Array under the All_Data group. This Dataset_Array is a single HDF5 dataset for each field. This single HDF5 dataset contains all the data for all granules in the file for a given field. However, for dynamically sized products, the object ID stored in the aggregation array points to an HDF5 group instead. This HDF5 group contains one or more datasets - a separate dataset for each granule for a given field. The dataset is named "Dataset_Array_Gran_n".

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

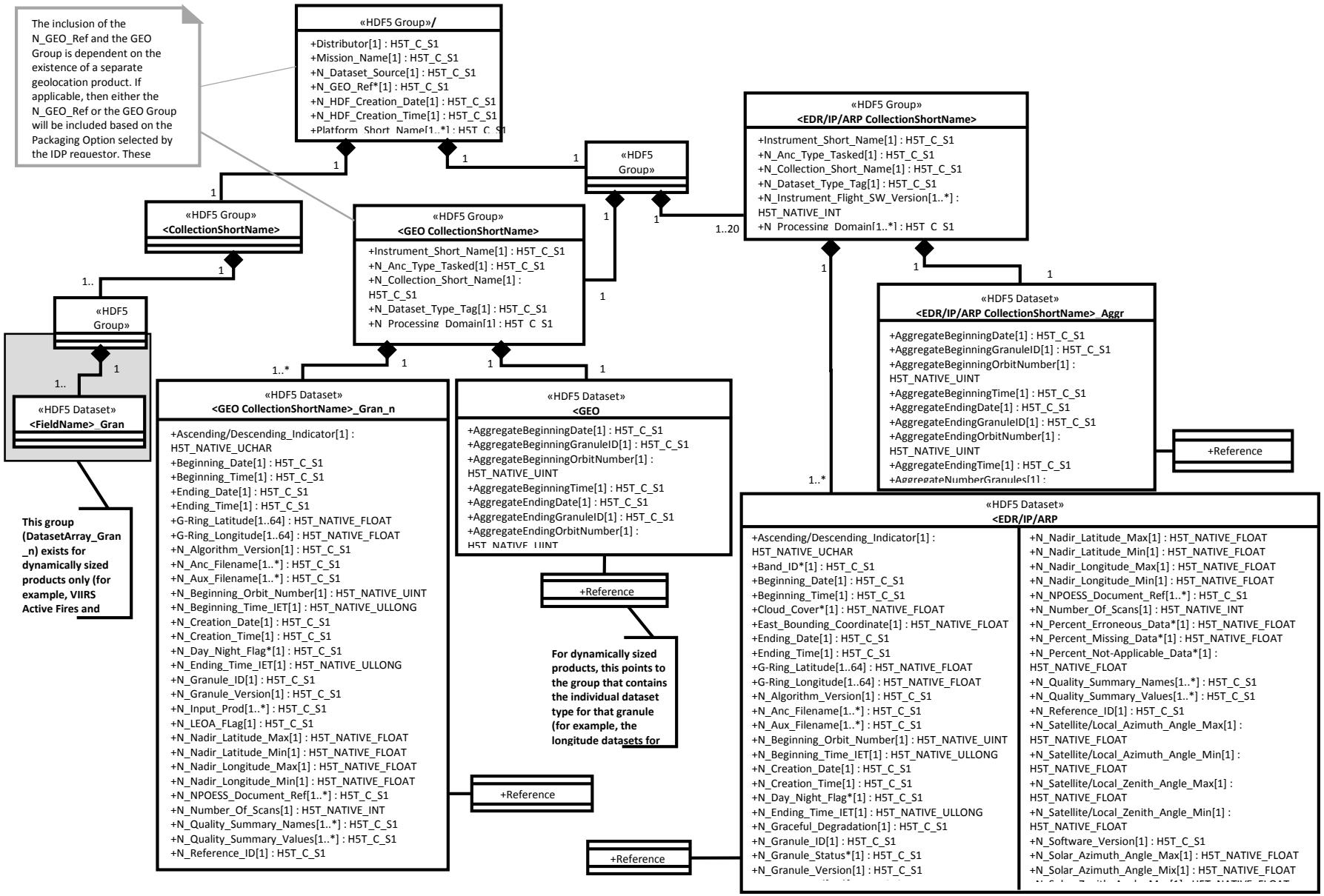

Figure: 3.2-1 Generalized UML Diagram for dynamically sized HDF5 IP/EDR Files

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

4 Intermediate Products (IPs)

IPs are defined as a data subset or retrieval by-product that is required within another primary data product's generation sequence or is used as an input to secondary processing or analysis. The IPs defined here can be packaged and delivered to the end-user. Other IPs are generated during the creation of EDRs but are not deliverable and are thus not documented here.

4.1 VIIRS Aerosol Model Information IP

Data Mnemonic	IMPI_VAMI_R0100 (Official) IMPI_VAMI_R0110 (Substitute)
Description/ Purpose	The VIIRS Aerosol Model Information (AMI) IP contains four arrays of integer values that indicate which aerosol model was selected during the Aerosol Optical Thickness (AOT) retrieval. Effectivity: S-NPP and JPSS
File-Naming Construct	See the JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.0 for details.
File Size	See Table 4.1.1-1, VIIRS Aerosol Model Information Data Content Summary for size.
File Format Type	HDF5
Production Frequency	As requested
Data Content and Data Format	The AMI IP dataset arrays contain integer values that indicate which aerosol model was selected during AOT retrieval. The dataset arrays, by mnemonic, contain: amdl aerosol model smmdl small mode aerosol model lgmdl large mode aerosol model combo ocean combination mode aerosol model See Section 4.1.1 VIIRS Aerosol Model Information IP Data Content Summary See Section 4.1.2 VIIRS Aerosol Model Information IP Product Profile See Section 4.1.3 VIIRS Aerosol Model Information IP HDF5 Details See Section 4.1.4 VIIRS Aerosol Model Information IP Metadata Details See Section 4.1.5 VIIRS Aerosol Model Information IP Geolocation Details

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4.1.1 VIIRS Aerosol Model Information IP Data Content Summary

Table: 4.1.1-1 VIIRS Aerosol Model Information Data Content Summary

Name	Description	Data Type	Aggregate Dimension	Granule Dimension	Units
amdl	Aerosol Model	Unsigned 8-bit Integer	[N*768, 3200]	[768, 3200]	Unitless
smmdl	Small Mode Aerosol Model	Unsigned 8-bit Integer	[N*768, 3200]	[768, 3200]	Unitless
lgmdl	Large Mode Aerosol Model	Unsigned 8-bit Integer	[N*768, 3200]	[768, 3200]	Unitless
combo	Ocean Combination Mode Aerosol Model. This is the integer percent of the small mode aerosol used in the ocean retrieval. 0 = 0% small mode and 100% large mode.	Unsigned 8-bit Integer	[N*768, 3200]	[768, 3200]	Unitless
File Size	**9,830,400 bytes**				

4.1.2 VIIRS Aerosol Model Information IP Product Profile

Table: 4.1.2-1 VIIRS Aerosol Model Information IP Product Profile

VIIRS_AEROS_MODL_INFO_IP Product Profile

Fields

Name	Data Size	Dimensions
amdl	1byte(s)	
smmdl	1byte(s)	

amdl — Dimensions:

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
M_VIIRS_SDR_ROWS	Yes	No	768	768
M_VIIRS_SDR_COLS	No	No	3200	3200

amdl — Datum:

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Aerosol Model	0	0	9	Unitless	No		unsigned 8-bit char	NA_UINT8_FILL	255		
								MISS_UINT8_FILL	254		
								ONBOARD_PT_UINT8_FILL	253		
								ONGROUND_PT_UINT8_FILL	252		
								ERR_UINT8_FILL	251		
								ELLIPSOID_UINT8_FILL	250		
								VDNE_UINT8_FILL	249		
								SOUB_UINT8_FILL	248		

smmdl — Dimensions:

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
M_VIIRS_SDR_ROWS	Yes	No	768	768
M_VIIRS_SDR_COLS	No	No	3200	3200

smmdl — Datum:

		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Small Mode Aerosol Model	0	0	3	Unitless	No		unsigned 8-bit char	Name	Value	Name	Value
										NA_UINT8_FILL	255		
										MISS_UINT8_FILL	254		
										ONBOARD_PT_UINT8_FILL	253		
										ONGROUND_PT_UINT8_FILL	252		
										ERR_UINT8_FILL	251		
										ELLIPSOID_UINT8_FILL	250		
										VDNE_UINT8_FILL	249		
										SOUB_UINT8_FILL	248		

lgmdl 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
M_VIIRS_SDR_ROWS	Yes	No	768	768
M_VIIRS_SDR_COLS	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Large Mode Aerosol Model	0	0	4	Unitless	No		unsigned 8-bit char	Name	Value	Name	Value
								NA_UINT8_FILL	255		
								MISS_UINT8_FILL	254		
								ONBOARD_PT_UINT8_FILL	253		
								ONGROUND_PT_UINT8_FILL	252		
								ERR_UINT8_FILL	251		
								ELLIPSOID_UINT8_FILL	250		
								VDNE_UINT8_FILL	249		
								SOUB_UINT8_FILL	248		

combo 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
M_VIIRS_SDR_ROWS	Yes	No	768	768
M_VIIRS_SDR_COLS	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Ocean Combination Mode Aerosol Model. This is the integer percent of the small mode aerosol used in the ocean retrieval. 0 = 0% small mode and 100% large mode.	0	0	100	Unitless	No		unsigned 8-bit char	Name	Value	Name	Value
								NA_UINT8_FILL	255		
								MISS_UINT8_FILL	254		
								ONBOARD_PT_UINT8_FILL	253		
								ONGROUND_PT_UINT8_FILL	252		
								ERR_UINT8_FILL	251		
								ELLIPSOID_UINT8_FILL	250		
								VDNE_UINT8_FILL	249		
								SOUB_UINT8_FILL	248		

4.1.3 VIIRS Aerosol Model Information HDF5 Details

Figure 4.1.3-1 provides detail on the contents and data types of the Aerosol product. This UML diagram provides details at the product level only. In addition to this UML diagram, refer to Figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

VIIRS-Aeros-Modl-Info-IP
+amdl : H5T_NATIVE_USHORT +smmdl : H5T_NATIVE_USHORT +lgmdl : H5T_NATIVE_USHORT +combo : H5T_NATIVE_USHORT

Figure: 4.1.3-1 VIIRS Aerosol Model Information UML Diagram

4.1.4 VIIRS Aerosol Model Information IP Metadata Details

The product metadata elements contained in the VIIRS Aerosol Model Information IP are listed in the JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms (474-00448-02-01). These metadata elements include all common metadata at the root, product, aggregation, and granule level.

There are no granule level Quality Flags defined as metadata elements in the VIIRS Aerosol Model Information RIP. Therefore, there are no entries in the N_Quality_Summary_Name/Value metadata attributes for this product.

4.1.5 VIIRS Aerosol Model Information IP Geolocation Details

The VIIRS Aerosol Model Information IP uses the VIIRS Moderate Resolution Geolocation - Terrain Corrected for its geolocation. See the 474-00448-02-06 Algorithm Specification for VIIRS RDR/SDR - Vol 2 - Data Dictionary, Section 6.2.5 for geolocation details.

4.2 VIIRS Aerosol Optical Thickness IP

Data Mnemonic	IMPI_VAOT_R0100 (Official) IMPI_VAOT_R010 (Substitute)
Description/ Purpose	The VIIRS Aerosol Optical Thickness RIP contains thickness values at assorted spectral bands over land and water as well as associated quality flags. (See Y2480 VIIRS Aerosol Particle Size Parameter Unit Level Detailed Design Document). NOTE: This may change because the surface reflectance IP requires AOT for Imagery bands; using a moderate resolution value instead of an imagery resolution value could yield a reflectance that challenges the specification value. Effectivity: S-NPP and JPSS-1
File-Naming Construct	See the JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.0 for details.
File Size	See Table 4.2.1-1 VIIRS Aerosol Optical Thickness Data Content Summary for size
File Format Type	HDF5
Production Frequency	As requested

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

Data Content and Data Format	This product contains an array of 32-bit AOT floating point values and 19 - 8-bit arrays of quality flags with the described formatting as shown in the following product profile tables See Section 4.2.1 VIIRS Aerosol Optical Thickness IP Data Content Summary See Section 4.2.2 VIIRS Aerosol Optical Thickness IP Product Profile See Section 4.2.3 VIIRS Aerosol Optical Thickness IP HDF5 Details See Section 4.2.4 VIIRS Aerosol Optical Thickness IP Metadata Details See Section 4.2.5 VIIRS Aerosol Optical Thickness IP Geolocation Details

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4.2.1 VIIRS Aerosol Optical Thickness IP Data Content Summary

Table: 4.2.1-1 VIIRS Aerosol Optical Thickness Data Content Summary

Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
faot550	550 Nanometer AOT Values	32-bit Floating Point Number	[N*768, 3200]	[768, 3200]	Unitless
aotSlant550	550 Nanometer Slant AOT Values	32-bit Floating Point Number	[N*768, 3200]	[768, 3200]	Unitless
angexp	Angstrom Exponent	32-bit Floating Point Number	[N*768, 3200]	[768, 3200]	Unitless
QF1	Quality Flags	Unsigned 8-bit Character	[N*768, 3200]	[768, 3200]	Unitless
QF2	Quality Flags	Unsigned 8-bit Character	[N*768, 3200]	[768, 3200]	Unitless
QF3	Quality Flags	Unsigned 8-bit Character	[N*768, 3200]	[768, 3200]	Unitless
QF4	Quality Flags	Unsigned 8-bit Character	[N*768, 3200]	[768, 3200]	Unitless
QF5	Quality Flags	Unsigned 8-bit Character	[N*768, 3200]	[768, 3200]	Unitless
File Size	**41,779,200 bytes**				

4.2.2 VIIRS Aerosol Optical Thickness IP Product Profile

Table: 4.2.2-1 VIIRS Aerosol Optical Thickness IP Product Profile

VIIRS_AEROS_OPT_THICK_IP Product Profile

Fields

Name	Data Size	Dimensions
faot550	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
M_VIIRS_SDR_ROWS	Yes	No	768	768
M_VIIRS_SDR_COLS	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
550 Nanometer AOT Values	0	MIN_VAL	MAX_VAL	Unitless	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ONBOARD_PT_FLOAT32_FILL	-999.7		
								ONGROUND_PT_FLOAT32_FILL	-999.6		
								ERR_FLOAT32_FILL	-999.5		
								ELLIPSOID_FLOAT32_FILL	-999.4		

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

											VDNE_FLOAT32_FILL	-999.3
											SOUB_FLOAT32_FILL	-999.2

aotSlant550 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
M_VIIRS_SDR_ROWS	Yes	No	768	768
M_VIIRS_SDR_COLS	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
550 Nanometer Slant AOT Values	0	MIN_VAL	MAX_VAL	Unitless	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ONBOARD_PT_FLOAT32_FILL	-999.7		
								ONGROUND_PT_FLOAT32_FILL	-999.6		
								ERR_FLOAT32_FILL	-999.5		
								ELLIPSOID_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		
								SOUB_FLOAT32_FILL	-999.2		

angexp 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
M_VIIRS_SDR_ROWS	Yes	No	768	768
M_VIIRS_SDR_COLS	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Angstrom Exponent	0	MIN_VAL	MAX_VAL	Unitless	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ONBOARD_PT_FLOAT32_FILL	-999.7		
								ONGROUND_PT_FLOAT32_FILL	-999.6		
								ERR_FLOAT32_FILL	-999.5		
								ELLIPSOID_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		
								SOUB_FLOAT32_FILL	-999.2		

VIIRS_AEROS_OPT_THICK_IP Product Profile - Quality Flags

Fields

Name	Data Size	Dimensions
QF1	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
M_VIIRS_SDR_ROWS	Yes	No	768	768
M_VIIRS_SDR_COLS	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Aerosol Optical Thickness Quality	0	0	3	Unitless	No		2 bit(s)	Name	Value	Name	Value
										High Quality	0
										Degraded Quality	1
										Excluded Quality	2
										Not Produced	3
Angstrom Exponent Quality	2	0	3	Unitless	No		2 bit(s)	Name	Value	Name	Value
										High Quality	0
										Degraded Quality	1
										Excluded Quality	2
										Not Produced	3
Suspended Matter Type Quality	4	0	3	Unitless	No		2 bit(s)	Name	Value	Name	Value
										High Quality	0
										Degraded Quality	1

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

											Excluded Quality 2 Not Produced 3
		Cloud Mask Quality	6	0	3	Unitless	No		2 bit(s)	Name Value	Name Value Poor 0 Low 1 Medium 2 High 3

QF2 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
M_VIIRS_SDR_ROWS	Yes	No	768	768
M_VIIRS_SDR_COLS	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Cloud Detection Result & Confidence Indicator	0	0	3	Unitless	No		2 bit(s)	Name Value	Name Value Confident Clear 0 Probably Clear 1 Probably Cloudy 2 Confident Cloudy 3
Adjacent Pixel Cloud Confidence Value	2	0	3	Unitless	No		2 bit(s)	Name Value	Name Value Confident Clear 0 Probably Clear 1 Probably Cloudy 2 Confident Cloudy 3
Land/Water Background	4	0	6	Unitless	No		3 bit(s)	Name Value	Name Value Land & Desert 0 Land & No Desert 1 Inland Water 2 Sea Water 3 Coastal 5
Bad SDR	7	0	1	Unitless	No		1 bit(s)	Name Value	Name Value Yes 1 No 0

QF3 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
M_VIIRS_SDR_ROWS	Yes	No	768	768
M_VIIRS_SDR_COLS	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Day/Night Flag	0	0	3	Unitless	No		2 bit(s)	Name Value	Name Value Day 0 Low Sun - Degraded 1 Twilight - Excluded 2 Night 3
Interpolation and Climatology/NAAPS Processing Used	2	0	3	Unitless	No		3 bit(s)	Name Value	Name Value None 0 Interpolation Only 1 Interpolation & Climatology/NAAPS 2 Climatology/NAAPS only 3
Sun Glint	5	0	7	Unitless	No		3 bit(s)	Name Value	Name Value None 0 Geometry Based 1 Wind Speed Based 2 Geometry & Wind 3

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

											Internal	4
											Internal & Geometry	5
											Internal & Wind	6
											All	7

QF4 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
M_VIIRS_SDR_ROWS	Yes	No	768	768
M_VIIRS_SDR_COLS	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Snow / Ice	0	0	1	Unitless	No		1 bit(s)	Name Value	Name Value Yes 1 No 0
Cirrus	1	0	1	Unitless	No		1 bit(s)	Name Value	Name Value Yes 1 No 0
Cloud Shadow	2	0	1	Unitless	No		1 bit(s)	Name Value	Name Value Yes 1 No 0
Fire	3	0	1	Unitless	No		1 bit(s)	Name Value	Name Value Yes 1 No 0
Bright Pixel	4	0	2	Unitless	No		2 bit(s)	Name Value	Name Value Dark 0 Soil Dominated 1 Bright 2
Turbid / Shallow Water	6	0	1	Unitless	No		1 bit(s)	Name Value	Name Value Yes 1 No 0
Ash	7	0	1	Unitless	No		1 bit(s)	Name Value	Name Value Yes 1 No 0

QF5 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
M_VIIRS_SDR_ROWS	Yes	No	768	768
M_VIIRS_SDR_COLS	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Low AOT - SM Typing Excluded	0	0	1	Unitless	No		1 bit(s)	Name Value	Name Value Yes 1 No 0
Low AOT - SM Detection Excluded	1	0	1	Unitless	No		1 bit(s)	Name Value	Name Value Yes 1 No 0
AOT Out of Spec Range	2	0	1	Unitless	No		1 bit(s)	Name Value	Name Value Yes 1 No 0
APSP Out of Spec Range	3	0	1	Unitless	No		1 bit(s)	Name Value	Name Value Yes 1 No 0
Low AOT - APSP Excluded	4	0	1	Unitless	No		1 bit(s)	Name Value	Name Value Yes 1 No 0
Residual Threshold Exceeded	5	0	1	Unitless	No		1 bit(s)	Name Value	Name Value Yes 1

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

										No 0
Homogeneity Test with M1 STD	6	0	1	Unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** Yes 1 No 0
Snow Adjacency	7	0	1	Unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** Yes 1 No 0

4.2.3 VIIRS Aerosol Optical Thickness HDF5 Details

Figure 4.2.3-1 provides detail on the contents and data types of the Aerosol Optical Thickness product. This UML diagram provides details at the product level only. In addition to this UML diagram, refer to Figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

VIIRS-Aeros-Opt-Thick-IP
+faot550 : H5T_NATIVE_FLOAT +aotSlant550 : H5T_NATIVE_FLOAT +angexp : H5T_NATIVE_FLOAT +QF1 : H5T_NATIVE_UCHAR +QF2 : H5T_NATIVE_UCHAR +QF3 : H5T_NATIVE_UCHAR +QF4 : H5T_NATIVE_UCHAR +QF5 : H5T_NATIVE_UCHAR

Figure: 4.2.3-1 VIIRS Aerosol Optical Thickness UML Diagram

4.2.4 VIIRS Aerosol Optical Thickness IP Metadata Details

The product metadata elements contained in the VIIRS Aerosol Optical Thickness IP are listed in the JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms (474-00448-02-01). These metadata elements include all common metadata at the root, product, aggregation, and granule level.

There are no granule level Quality Flags defined as metadata elements in the VIIRS Aerosol Optical Thickness IP. Therefore, there are no entries in the N_Quality_Summary_Name/Value metadata attributes for this product.

4.2.5 VIIRS Aerosol Optical Thickness IP Geolocation Details

The VIIRS Aerosol Optical Thickness IP uses the VIIRS Moderate Resolution Geolocation - Terrain Corrected for its Geolocation. See the 474-00448-02-06 Algorithm Specification for VIIRS RDR/SDR - Vol 2 - Data Dictionary, Section 6.2.5 for geolocation details.

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

5 Environmental Data Records (EDRs)

Environmental Data Records (EDRs) are data records that contain the environmental parameters or imagery generated by the JPSS system as products deliverable to the user. The JPSS and S-NPP required set of EDRs are defined in 470-00067-02, the JPSS Ground System Requirements Document, Vol 2. An EDR is either an official EDR, which means that it is part of the set of official JPSS Data Products, or it is a substitute EDR. A substitute EDR is produced by substitute ancillary data, data defined by the IDP operator in order to create a data product using different input (specifically, different ancillary data) than that which is prescribed by JPSS. EDRs provide stable measurements useful for long-term trends. An EDR contains the following:

- EDR specific data (as described in each section)
- Appropriate geolocation values
- Quality Flags
- Metadata represented as Attributes in the HDF5 file that are provided at the granule and aggregation level
- The EDRs are separated by category and are presented alphabetically within each category. All S-NPP EDRs are also delivered during JPSS, thus only those EDRs which are JPSS-only are annotated as such within their respective Description/Purpose section of their interface definition.

5.1 VIIRS Aerosol

Data Mnemonic	EDRE-AOTH-C1030 (Official) EDRE-AOTH-C1031 (Substitute)
Description/ Purpose	The VIIRS Aerosol product consists of the VIIRS Aerosol Optical Thickness (AOT) EDR and the VIIRS Aerosol Particle Size Parameter (APSP) EDR. These two EDRs have been combined into a single product. The VIIRS AOT EDR provides aerosol optical thicknesses for a vertical column over both land and ocean globally on a daily basis. AOT is retrieved only during the daytime under clear conditions when the cell is not in cloud shadow. The AOT retrievals over ocean are executed on a VIIRS pixel-by-pixel basis. The AOT is produced globally at 12.8 km or less resolution (8 x 8 moderate resolution pixel aggregation at nadir). This product is produced from all nominal JPSS-1 orbits, but the measurement accuracy for a terminator orbit will be degraded due to a high incidence of challenging forward scattering geometries. For both ocean and land, the Aerosol Optical Depths values are obtained based on a chosen aerosol model at the 550nm wavelength. A Look-up table correlates AOTs at 550nm to AOTs at other wavelengths. With the exception of the 550nm output, linear interpolation is performed on the LUT values to obtain AOTs for the output wavelengths: • 0.412 microns • 0.445 microns • 0.488 microns • 0.555 microns

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

	• 0.672 microns • 0.746 microns • 0.865 microns • 1.240 microns • 1.610 microns • 2.250 microns • 0.550 microns Note that although the first ten wavelengths listed above correspond to center wavelengths for bands M1 - M8 and M10 - M11, these AOTs are not retrieved directly from the radiances of those bands. The AOT EDR is generated where the local Solar Zenith Angle <= 80°. Note: The term 'water' is for the most part synonymous with 'ocean water'. The description will be specific in quality flag descriptions when referring to inland water or lakes where aerosols are not retrieved by VIIRS. The VIIRS Aerosol Particle Size Parameter (APSP) EDR is produced at the same resolution (8 x 8 moderate resolution pixel aggregation at nadir) as the AOT EDR. The APSP reports the angstrom wavelength exponent over both land and ocean. The angstrom exponent is calculated using two different narrow band wavelengths and is an indicator of aerosol particle size. Larger values indicate small particles and smaller values indicate large particles such as sea salt and dust.
File-Naming Construct	See the JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4 for details.
File Size	Estimated Granule Size: Aerosol Product: See Table: 5.1.1-1 VIIRS Aerosol Data Content Summary for size This granule size includes VIIRS Aerosol Product related fields and quality flags only. Geolocation and metadata attributes are not included. Additional size added by HDF5 packaging is also not included.
File Format Type	HDF5
Data Content and Data Format	See Section 5.1.1, VIIRS Aerosol Data Content Summary See Section 5.1.2, VIIRS Aerosol Product Profile See Section 5.1.3, VIIRS Aerosol HDF5 Details See Section 5.1.4, VIIRS Aerosol Metadata Details See Section 5.1.5, VIIRS Aerosol Geolocation Details See Section 5.1.6, VIIRS Aerosol Geolocation Product Profile See Section 5.1.7, VIIRS Aerosol Geolocation HDF5 Details See Section 5.1.8, VIIRS Aerosol Geolocation HDF5 Metadata Details

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

5.1.1 VIIRS Aerosol Data Content Summary

Table: 5.1.1-1 VIIRS Aerosol Data Content Summary

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
AerosolOpticalDepth_at_412nm	Aerosol Optical Depth at 412nm	unsigned 16-bit integer	[N*96, 400]	[96, 400]	unitless
AerosolOpticalDepth_at_445nm	Aerosol Optical Depth at 445nm	unsigned 16-bit integer	[N*96, 400]	[96, 400]	unitless
AerosolOpticalDepth_at_488nm	Aerosol Optical Depth at 488nm	unsigned 16-bit integer	[N*96, 400]	[96, 400]	unitless
AerosolOpticalDepth_at_555nm	Aerosol Optical Depth at 555nm	unsigned 16-bit integer	[N*96, 400]	[96, 400]	unitless
AerosolOpticalDepth_at_672nm	Aerosol Optical Depth at 672nm	unsigned 16-bit integer	[N*96, 400]	[96, 400]	unitless
AerosolOpticalDepth_at_746nm	Aerosol Optical Depth at 746nm	unsigned 16-bit integer	[N*96, 400]	[96, 400]	unitless
AerosolOpticalDepth_at_865nm	Aerosol Optical Depth at 865nm	unsigned 16-bit integer	[N*96, 400]	[96, 400]	unitless
AerosolOpticalDepth_at_1240nm	Aerosol Optical Depth at 1240nm	unsigned 16-bit integer	[N*96, 400]	[96, 400]	unitless
AerosolOpticalDepth_at_1610nm	Aerosol Optical Depth at 1610nm	unsigned 16-bit integer	[N*96, 400]	[96, 400]	unitless
AerosolOpticalDepth_at_2250nm	Aerosol Optical Depth at 2250nm	unsigned 16-bit integer	[N*96, 400]	[96, 400]	unitless
AerosolOpticalDepth_at_550nm	Aerosol Optical Depth Interpolated to 550nm	unsigned 16-bit integer	[N*96, 400]	[96, 400]	unitless
AngstromExponent	Aerosol Angstrom Wavelength Exponent	unsigned 16-bit integer	[N*96, 400]	[96, 400]	unitless
QF1_VIIRSAEROEDR	Aerosol Quality Flags	unsigned 8-bit char	[N*96, 400]	[96, 400]	unitless
QF2_VIIRSAEROEDR		unsigned 8-bit char	[N*96, 400]	[96, 400]	unitless
QF3_VIIRSAEROEDR		unsigned 8-bit char	[N*96, 400]	[96, 400]	unitless
QF4_VIIRSAEROEDR		unsigned 8-bit char	[N*96, 400]	[96, 400]	unitless
QF5_VIIRSAEROEDR		unsigned 8-bit char	[N*96, 400]	[96, 400]	unitless
SmallModeFraction	Applies to ocean pixels	unsigned 8-bit char	[N*96, 400]	[96, 400]	percent

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
AerosolOpticalDepthFactors	A 32-bit floating point array consisting of two elements: the first is the scale value, the second is the offset value	32-bit floating point	[N*2]	[2]	unitless
AngstromExponentFactors		32-bit floating point	[N*2]	[2]	unitless
File Size	**1,152,016 Bytes**				

5.1.2 VIIRS Aerosol Product Profile

Table: 5.1.2-1 VIIRS Aerosol Product Profile

VIIRS Aerosol Product Profile

Fields

Name	Data Size	Dimensions
AerosolOpticalDepth_at_412nm	2byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Aerosol Optical Depth Interpolated to 412nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer		

Name	Value
NA_UINT16_FILL	65535
MISS_UINT16_FILL	65534
ONBOARD_PT_UINT16_FILL	65533
ONGROUND_PT_UINT16_FILL	65532
ERR_UINT16_FILL	65531
ELLIPSOID_UINT16_FILL	65530
VDNE_UINT16_FILL	65529
SOUB_UINT16_FILL	65528

Name	Value

Name	Data Size	Dimensions
AerosolOpticalDepth_at_445nm	2byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Aerosol Optical Depth Interpolated to 445nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer		

Name	Value
NA_UINT16_FILL	65535
MISS_UINT16_FILL	65534
ONBOARD_PT_UINT16_FILL	65533
ONGROUND_PT_UINT16_FILL	65532
ERR_UINT16_FILL	65531
ELLIPSOID_UINT16_FILL	65530
VDNE_UINT16_FILL	65529
SOUB_UINT16_FILL	65528

Name	Value

Name	Data Size	Dimensions
AerosolOpticalDepth_at_488nm	2byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96

CrossTrack	No	No	400	400		

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Aerosol Optical Depth Interpolated to 488nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								ELLIPSOID_UINT16_FILL	65530		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

AerosolOpticalDepth_at_555nm — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Aerosol Optical Depth Interpolated to 555nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								ELLIPSOID_UINT16_FILL	65530		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

AerosolOpticalDepth_at_672nm — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Aerosol Optical Depth Interpolated to 672nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								ELLIPSOID_UINT16_FILL	65530		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

AerosolOpticalDepth_at_746nm — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Aerosol Optical Depth Interpolated to 746nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								ELLIPSOID_UINT16_FILL	65530		

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											VDNE_UINT16_FILL	65529	
											SOUB_UINT16_FILL	65528	

AerosolOpticalDepth_at_865nm 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Aerosol Optical Depth Interpolated to 865nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	Name	Value	Name	Value
								NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								ELLIPSOID_UINT16_FILL	65530		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

AerosolOpticalDepth_at_1240nm 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Aerosol Optical Depth Interpolated to 1240nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	Name	Value	Name	Value
								NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								ELLIPSOID_UINT16_FILL	65530		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

AerosolOpticalDepth_at_1610nm 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Aerosol Optical Depth Interpolated to 1610nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	Name	Value	Name	Value
								NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								ELLIPSOID_UINT16_FILL	65530		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

AerosolOpticalDepth_at_2250nm 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Aerosol Optical Depth Interpolated to 2250nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	Name	Value	Name	Value
								NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		

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										ONBOARD_PT_UINT16_FILL	65533	
										ONGROUND_PT_UINT16_FILL	65532	
										ERR_UINT16_FILL	65531	
										ELLIPSOID_UINT16_FILL	65530	
										VDNE_UINT16_FILL	65529	
										SOUB_UINT16_FILL	65528	

AerosolOpticalDepth_at_550nm	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**								
		AlongTrack	Yes	No	96	96								
		CrossTrack	No	No	400	400								
		Datum												
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**		
		Aerosol Optical Depth at 550nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	**Name**	**Value**	**Name**	**Value**	
										NA_UINT16_FILL	65535			
										MISS_UINT16_FILL	65534			
										ONBOARD_PT_UINT16_FILL	65533			
										ONGROUND_PT_UINT16_FILL	65532			
										ERR_UINT16_FILL	65531			
										ELLIPSOID_UINT16_FILL	65530			
										VDNE_UINT16_FILL	65529			
										SOUB_UINT16_FILL	65528			
AngstromExponent	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**								
		AlongTrack	Yes	No	96	96								
		CrossTrack	No	No	400	400								
		Datum												
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**		
		Aerosol Angstrom Wavelength Exponent	0	-2.00	10.00	unitless	Yes	AngstromExponentFactors	unsigned 16-bit integer	**Name**	**Value**	**Name**	**Value**	
										NA_UINT16_FILL	65535			
										MISS_UINT16_FILL	65534			
										ONBOARD_PT_UINT16_FILL	65533			
										ONGROUND_PT_UINT16_FILL	65532			
										ERR_UINT16_FILL	65531			
										ELLIPSOID_UINT16_FILL	65530			
										VDNE_UINT16_FILL	65529			
										SOUB_UINT16_FILL	65528			

VIIRS Aerosol Product Profile

Fields														
Name	**Data Size**	**Dimensions**												
AerosolOpticalDepth_at_412nm	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**								
		AlongTrack	Yes	No	96	96								
		CrossTrack	No	No	400	400								
		Datum												
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**		
		Aerosol Optical Depth Interpolated to 412nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	**Name**	**Value**	**Name**	**Value**	
										NA_UINT16_FILL	65535			
										MISS_UINT16_FILL	65534			
										ONBOARD_PT_UINT16_FILL	65533			
										ONGROUND_PT_UINT16_FILL	65532			
										ERR_UINT16_FILL	65531			
										ELLIPSOID_UINT16_FILL	65530			
										VDNE_UINT16_FILL	65529			
										SOUB_UINT16_FILL	65528			

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AerosolOpticalDepth_at_445nm 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Aerosol Optical Depth Interpolated to 445nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	Name	Value	Name	Value
								NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								ELLIPSOID_UINT16_FILL	65530		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

AerosolOpticalDepth_at_488nm 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Aerosol Optical Depth Interpolated to 488nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	Name	Value	Name	Value
								NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								ELLIPSOID_UINT16_FILL	65530		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

AerosolOpticalDepth_at_555nm 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Aerosol Optical Depth Interpolated to 555nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	Name	Value	Name	Value
								NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								ELLIPSOID_UINT16_FILL	65530		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

AerosolOpticalDepth_at_672nm 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Aerosol Optical Depth Interpolated to 672nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	Name	Value	Name	Value
								NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

										ERR_UINT16_FILL	65531
										ELLIPSOID_UINT16_FILL	65530
										VDNE_UINT16_FILL	65529
										SOUB_UINT16_FILL	65528

AerosolOpticalDepth_at_746nm 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Aerosol Optical Depth Interpolated to 746nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	Name	Value	Name	Value
								NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								ELLIPSOID_UINT16_FILL	65530		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

AerosolOpticalDepth_at_865nm 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Aerosol Optical Depth Interpolated to 865nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	Name	Value	Name	Value
								NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								ELLIPSOID_UINT16_FILL	65530		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

AerosolOpticalDepth_at_1240nm 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Aerosol Optical Depth Interpolated to 1240nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	Name	Value	Name	Value
								NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								ELLIPSOID_UINT16_FILL	65530		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

AerosolOpticalDepth_at_1610nm 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

		Aerosol Optical Depth Interpolated to 1610nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	**Name** / **Value**: NA_UINT16_FILL 65535; MISS_UINT16_FILL 65534; ONBOARD_PT_UINT16_FILL 65533; ONGROUND_PT_UINT16_FILL 65532; ERR_UINT16_FILL 65531; ELLIPSOID_UINT16_FILL 65530; VDNE_UINT16_FILL 65529; SOUB_UINT16_FILL 65528	**Name** / **Value**

AerosolOpticalDepth_at_2250nm — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Aerosol Optical Depth Interpolated to 2250nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	**Name** / **Value**: NA_UINT16_FILL 65535; MISS_UINT16_FILL 65534; ONBOARD_PT_UINT16_FILL 65533; ONGROUND_PT_UINT16_FILL 65532; ERR_UINT16_FILL 65531; ELLIPSOID_UINT16_FILL 65530; VDNE_UINT16_FILL 65529; SOUB_UINT16_FILL 65528	**Name** / **Value**

AerosolOpticalDepth_at_550nm — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Aerosol Optical Depth at 550nm	0	-1.00	10.00	unitless	Yes	AerosolOpticalDepthFactors	unsigned 16-bit integer	**Name** / **Value**: NA_UINT16_FILL 65535; MISS_UINT16_FILL 65534; ONBOARD_PT_UINT16_FILL 65533; ONGROUND_PT_UINT16_FILL 65532; ERR_UINT16_FILL 65531; ELLIPSOID_UINT16_FILL 65530; VDNE_UINT16_FILL 65529; SOUB_UINT16_FILL 65528	**Name** / **Value**

AngstromExponent — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Aerosol Angstrom Wavelength Exponent	0	-2.00	10.00	unitless	Yes	AngstromExponentFactors	unsigned 16-bit integer	**Name** / **Value**: NA_UINT16_FILL 65535; MISS_UINT16_FILL 65534; ONBOARD_PT_UINT16_FILL 65533; ONGROUND_PT_UINT16_FILL 65532; ERR_UINT16_FILL 65531; ELLIPSOID_UINT16_FILL 65530; VDNE_UINT16_FILL 65529; SOUB_UINT16_FILL 65528	**Name** / **Value**

VIIRS Aerosol Product Profile - Quality Flags

Fields

Name	Data Size	Dimensions
QF1_VIIRSAEROEDR	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values (Name, Value)	Legend Entries (Name, Value)
AOT Product Quality - Valid over land and ocean	0	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)		Not Retrieved 0 Low 1 Medium 2 High 3
APSP Quality (Anstrom Exponent Quality) - Valid over land and ocean	2	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)		Not Retrieved 0 Low 1 Medium 2 High 3
Land / Ocean / Not Produced	4	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)		Land 0 Ocean 1 Excluded Not Produced 3
AOT is outside of the System Specification Range - Valid over land and ocean	6	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)		False 0 True 1
APSP is outside of the System Specification Range - Valid over land and ocean	7	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)		False 0 True 1

Name	Data Size	Dimensions
QF2_VIIRSAEROEDR	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values (Name, Value)	Legend Entries (Name, Value)
Cloud Contamination in Cell - Valid over land and ocean	0	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)		False 0 True 1
Cloud Adjacent to Cell - Valid over land and ocean	1	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)		False 0 True 1
Cirrus Contamination in Cell - Valid over land and ocean	2	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)		False 0 True 1
Bad SDR Data Present in Horizontal Cell (Quality of AOT/APSP degraded or AOT/APSP not retrieved due to bad SDR data in horizontal cell) - Valid over land and ocean	3	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)		False 0 True 1
Sun Glint in Cell - Valid over land and ocean	4	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)		False 0 True 1
Cloud Shadow in Cell - Valid over land and ocean	5	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)		False 0 True 1
Snow / Ice in Cell - Valid over land and ocean	6	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)		

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														False	0
														True	1
		Fire Detected in Cell - Valid over land and ocean	7	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value			False	0
														True	1

QF3_VIIRSAEROEDR 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Low Sun, Degraded, 65 degrees < Solar Zenith Angle <= 80 degrees	0	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Low Sun, Excluded, Solar Zenith Angle > 80 degrees	1	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Bright Surface in Cell (Land) / Shallow or Turbid Water in Cell (Ocean)	2	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Excluded, Angstrom Exponent for AOT at 550 nm < 0.15	3	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Homogeneity Test with M1 STD	4	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Snow Adjacency	5	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Spare	6	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	Name Value	Name Value

QF4_VIIRSAEROEDR 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Land Model Aerosol Index (Land only) - Valid over land only	0	MIN_VAL	MAX_VAL	unitless	No		3 bit(s)	Name Value	Name Value Dust 0 Smoke - High Absorption 1 Smoke - Low Absorption 2 Urban - Clean 3 Urban - Polluted 4 NA - Not Land 7
spare	3	MIN_VAL	MAX_VAL	unitless	No		5 bit(s)	Name Value	Name Value

QF5_VIIRSAEROEDR 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Small Mode Aerosol Model (Ocean only)	0	MIN_VAL	MAX_VAL	unitless	No		3 bit(s)	Name Value	Name Value Fine Mode 1 0 Fine Mode 2 1 Fine Mode 3 2 Fine Mode 4 3 NA - No Ocean 7

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		Large Mode Aerosol Model (Ocean only)	3	MIN_VAL	MAX_VAL	unitless	No		3 bit(s)	Name / Value	Name / Value: Course Mode 1 / 0; Course Mode 2 / 1; Course Mode 3 / 2; Course Mode 4 / 3; Course Mode 5 / 4; NA - No Ocean / 7		
		spare	6	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	Name / Value	Name / Value		
SmallModeFraction	1byte(s)												

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Small Mode Fraction (Ocean only)	0	0	100	percent	No		unsigned 8-bit char	Name	Value	Name	Value
								NA_UINT8_FILL	255		
								MISS_UINT8_FILL	254		
								ONBOARD_PT_UINT8_FILL	253		
								ONGROUND_PT_UINT8_FILL	252		
								ERR_UINT8_FILL	251		
								ELLIPSOID_UINT8_FILL	250		
								VDNE_UINT8_FILL	249		

VIIRS Aerosol Product Profile - Scale Factors

Fields

Name	Data Size	Dimensions
AerosolOpticalDepthFactors	4byte(s)	
AngstromExponentFactors	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	2	2

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Scale = first array element; Offset = 2nd array element	0	MIN_VAL	MAX_VAL	unitless	No		32-bit floating point	Name	Value	Name	Value

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5.1.3 VIIRS Aerosol HDF5 Details

Figure 5.1.3-1 provides detail on the contents and data types of the Aerosol product. This UML diagram provides details at the product level only. In addition to this UML diagram, refer to Figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

VIIRS-Aeros-EDR
+ AerosolOpticalDepth_at412nm: H5T_NATIVE_UINT + AerosolOpticalDepth_at445nm: H5T_NATIVE_UINT + AerosolOpticalDepth_at488nm: H5T_NATIVE_UINT + AerosolOpticalDepth_at555nm: H5T_NATIVE_UINT + AerosolOpticalDepth_at672nm: H5T_NATIVE_UINT + AerosolOpticalDepth_at746nm: H5T_NATIVE_UINT + AerosolOpticalDepth_at865nm: H5T_NATIVE_UINT + AerosolOpticalDepth_at1240nm: H5T_NATIVE_UINT + AerosolOpticalDepth_at1610nm: H5T_NATIVE_UINT + AerosolOpticalDepth_at2250nm: H5T_NATIVE_UINT + AerosolOpticalDepth_at2250nm: H5T_NATIVE_UINT + AerosolOpticalDepth_at550nm: H5T_NATIVE_UINT + AngstromExponent: H5T_NATIVE_USHORT + QF1_VIIRSAEROEDR: H5T_NATIVE_UCHAR + QF2_VIIRSAEROEDR: H5T_NATIVE_UCHAR + QF3_VIIRSAEROEDR: H5T_NATIVE_UCHAR + QF4_VIIRSAEROEDR: H5T_NATIVE_UCHAR + QF5_VIIRSAEROEDR: H5T_NATIVE_UCHAR + QF6_VIIRSAEROEDR: H5T_NATIVE_UCHAR + AerosalOpticalDepthFactors: H5T_NATIVE_FLOAT + AngstromExponentFactors: H5T_NATIVE_FLOAT

Figure: 5.1.3-1 VIIRS Aerosol HDF5 UML Diagram

5.1.4 VIIRS Aerosol HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS AOT EDR are listed in the JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms (474-00448-02-01). The VIIRS EDR metadata includes all common metadata at the root, product, aggregation, and granule levels. In addition to the common metadata items for this product, Table 5.1.4-1, VIIRS Aerosol Quality Summary Metadata Values, provide the following items as name/value pairs. The listed name/value pair items in the table are the granule level quality flags for the VIIRS Aerosol.

Table: 5.1.4-1 VIIRS Aerosol Quality Summary Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Comments**
Aerosol AOT Summary Quality	0 - 100	Percent of cells with high quality AOT retrieval	This is a granule level quality flag.
Aerosol APSP Summary Quality	0 - 100	Percent of cells with high quality APSP retrieval	This is a granule level quality flag.

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

N_Quality_Summary			
AOT Exclusion Summary	0 - 100	Percent of cells with AOT retrieval quality “LOW” or “NO RETREIVAL”	This is a granule level quality flag.
APSP Exclusion Summary	0 - 100	Percent of cells with APSP retrieval quality “LOW” or “NO RETREIVAL”	This is a granule level quality flag.
No Land in Granule	0 - 1	Indicates whether the product granule contains any land coverage or not. This is a granule level quality flag.	0 = Land Present in Granule 1= No Land Present in Granule
No Ocean in Granule	0 - 1	Indicates whether the product granule contains any ocean coverage or not. This is a granule level quality flag.	0 = Ocean Present in Granule 1 = No Ocean Present in Granule

5.1.5 VIIRS Aerosol Geolocation Details

Data Mnemonic	None.
Description/ Purpose	The VIIRS Aerosol Geolocation is produced at the same resolution (8 x 8 moderate resolution pixel aggregation at nadir) as the VIIRS Aerosol Product and is based on the VIIRS moderate resolution geolocation with terrain correction applied.
File-Naming Construct	See the JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4 for details.
File Size	Estimated Granule Size: See Table: 5.1.5-1 VIIRS Aerosol Geolocation Data Content Summary for size
File Format Type	HDF5
Data Content and Data Format	The VIIRS Aerosol Geolocation contains: Time Fields Geolocation Angular Fields Height and Satellite Range Spacecraft Position, Velocity, and Attitude Spacecraft Solar Zenith and Azimuth Angles Geolocation Quality Flags See Section 5.1.5, VIIRS Aerosol Geolocation Details See Section 5.1.6, VIIRS Aerosol Geolocation Product Profile See Section 5.1.7, VIIRS Aerosol Geolocation HDF5 Details See Section 5.1.8, VIIRS Aerosol Geolocation HDF5 Metadata Details

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

Table: 5.1.5-1 VIIRS Aerosol Geolocation Data Content Summary

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
StartTime	Starting Time of each scan in IET (1/1/1958)	64-bit integer	[N*48]	[48]	microsecond
MidTime	Mid-Time of each scan in IET (1/1/1958)	64-bit integer	[N*48]	[48]	microsecond
Latitude	Latitude of each cell (positive North)	32-bit floating point	[N*96, 400]	[96, 400]	degree
Longitude	Longitude of each cell (positive East)	32-bit floating point	[N*96, 400]	[96, 400]	degree
SolarZenithAngle	Zenith angle of sun at each cell position	32-bit floating point	[N*96, 400]	[96, 400]	degree
SolarAzimuthAngle	Azimuth angle of sun (measured clockwise positive from North) at each cell position	32-bit floating point	[N*96, 400]	[96, 400]	degree
SatelliteZenithAngle	Zenith angle to Satellite at each cell position	32-bit floating point	[N*96, 400]	[96, 400]	degree
SatelliteAzimuthAngle	Azimuth angle (measured clockwise positive from North) to Satellite at each cell position	32-bit floating point	[N*96, 400]	[96, 400]	degree
Height	Height above Mean Sea Level	32-bit floating point	[N*96, 400]	[96, 400]	meter
SatelliteRange	Line of sight distance from the ellipsoid intersection to the satellite	32-bit floating point	[N*96, 400]	[96, 400]	meter
SCPosition	Spacecraft position in ECR Coordinates (X, Y, Z) at the mid-time of scan	32-bit floating point	[N*48, 3]	[48, 3]	meter
SCVelocity	Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the mid-time of scan	32-bit floating point	[N*48, 3]	[48, 3]	m/s

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
SCAttitude	Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at the midtime of scan	32-bit floating point	[N*48, 3]	[48, 3]	arcsecond
QF1_SCAN_VIIRSAEROGEO	Scan Level Geolocation Quality Flags	unsigned 8-bit char	[N*48]	[48]	unitless
QF2_VIIRSAEROGEO	Cell Level Geolocation Quality Flags	unsigned 8-bit char	[N*96, 400]	[96, 400]	unitless
File Size	**1,269,744 Bytes**				

5.1.6 VIIRS Aerosol Geolocation Product Profile

Table: 5.1.6-1 VIIRS Aerosol Geolocation Product Profile

VIIRS Aerosol Geolocation Product Profile

Fields

Name	Data Size	Dimensions
StartTime	8byte(s)	
MidTime	8byte(s)	
Latitude	4byte(s)	

StartTime — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

StartTime — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Starting Time of each scan in IET (1/1/1958)	0	MIN_VAL	MAX_VAL	microsecond	No		64-bit integer	NA_INT64_FILL	-999		
								MISS_INT64_FILL	-998		
								ERR_INT64_FILL	-995		
								VDNE_INT64_FILL	-993		

MidTime — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

MidTime — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Mid-Time of each scan in IET (1/1/1958)	0	MIN_VAL	MAX_VAL	microsecond	No		64-bit integer	NA_INT64_FILL	-999		
								MISS_INT64_FILL	-998		
								ERR_INT64_FILL	-995		
								VDNE_INT64_FILL	-993		

Latitude — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Latitude — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Latitude of each cell (positive North)	0	MIN_VAL	MAX_VAL	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

											MISS_FLOAT32_FILL	-999.8
											ERR_FLOAT32_FILL	-999.5
											ELLIPSOID_FLOAT32_FILL	-999.4
											VDNE_FLOAT32_FILL	-999.3

Longitude — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Longitude of each cell (positive East)	0	MIN_VAL	MAX_VAL	degree	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								ELLIPSOID_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		

SolarZenithAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Zenith angle of sun at each cell position	0	MIN_VAL	MAX_VAL	degree	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								ELLIPSOID_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		

SolarAzimuthAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Azimuth angle of sun (measured clockwise positive from North) at each cell position	0	MIN_VAL	MAX_VAL	degree	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								ELLIPSOID_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		

SatelliteZenithAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Zenith angle to Satellite at each cell position	0	MIN_VAL	MAX_VAL	degree	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								ELLIPSOID_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		

SatelliteAzimuthAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

		CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Azimuth angle (measured clockwise positive from North) to Satellite at each cell position	0	MIN_VAL	MAX_VAL	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								ELLIPSOID_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		

Height — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Height above Mean Sea Level	0	MIN_VAL	MAX_VAL	meter	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								ELLIPSOID_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		

SatelliteRange — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Line of sight distance from the ellipsoid intersection to the satellite	0	MIN_VAL	MAX_VAL	meter	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								ELLIPSOID_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		

SCPosition — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48
ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Spacecraft position in ECR Coordinates (X, Y, Z) at the mid-time of scan	0	MIN_VAL	MAX_VAL	meter	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

SCVelocity	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**											
		Scan	Yes	No	48	48											
		ECRCoordinate	No	No	3	3											
		Datum															
		Description					**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the mid-time of scan					0	MIN_VAL	MAX_VAL	m/s	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
														NA_FLOAT32_FILL	-999.9		
														MISS_FLOAT32_FILL	-999.8		
														ERR_FLOAT32_FILL	-999.5		
														VDNE_FLOAT32_FILL	-999.3		
SCAttitude	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**											
		Scan	Yes	No	48	48											
		GRFCoordinate	No	No	3	3											
		Datum															
		Description					**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at the midtime of scan					0	MIN_VAL	MAX_VAL	arcsecond	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
														NA_FLOAT32_FILL	-999.9		
														MISS_FLOAT32_FILL	-999.8		
														ERR_FLOAT32_FILL	-999.5		
														VDNE_FLOAT32_FILL	-999.3		

VIIRS Aerosol Geolocation Product Profile - Quality Flags

Fields																	
Name	**Data Size**	**Dimensions**															
QF1_SCAN_VIIRSAEROGEO	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**											
		Scan	Yes	No	48	48											
		Datum															
		Description					**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Attitude and Ephemeris Availability Status					0	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	**Name**	**Value**	**Name**	**Value**
																Nominal - E&A data available	0
																Missing Data <= Small Gap	1
																Small Gap < Missing Data < Granule Boundary	2
																Missing Data >= Granule Boundary	3
		HAM/RTA Encoder Flag - Indicates the quality of the HAM and RTA encoder timestamps					2	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	**Name**	**Value**	**Name**	**Value**
																Good Data	0
																Bad Data - either HAM, RTA, or both are bad for the entire scan.	1
																Degraded Data - either HAM, RTA, or both are corrupted within the scan.	2
																Missing Data - Missing encoder data for the scan	3
		Within South Atlantic Anomaly					4	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**
																False	0
																True	1
		Solar Eclipse during Earth view scan					5	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**
																False	0

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

													True	1	
		Spare	6	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**		
		Half Angle Mirror side	7	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**		
												Mirror Side A	0		
												Mirror Side B	1		

QF2_VIIRSAEROGEO — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	96	96
CrossTrack	No	No	400	400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Invalid Input Data (Indicates that any of the Spacecraft Ephemeris or Attitude Data is Invalid or the encoder data is invalid)	0	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**
										False	0
										True	1
Bad Pointing (Indicates that the sensor LOS does not intersect the geoid or is near the limb based upon sensor zenith angle.)	1	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**
										False	0
										True	1
Bad Terrain (Indicates that the algorithm could not obtain a valid terrain value.)	2	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**
										False	0
										True	1
Invalid Solar Angles	3	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**
										False	0
										True	1
Spare	4	MIN_VAL	MAX_VAL	unitless	No		4 bit(s)	**Name**	**Value**	**Name**	**Value**

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

5.1.7 VIIRS Aerosol Geolocation HDF5 Details

Figure 5.1.7-1 provides detail on the contents and data types of this geolocation product.

VIIRS-Aero-EDR-GEO
+ StartTime: H5T_NATIVE_LLONG + MidTime: H5T_NATIVE_LLONG + Latitude: H5T_NATIVE_FLOAT + Longitude: H5T_NATIVE_FLOAT + SolarZenithAngle: H5T_NATIVE_FLOAT + SolarAzimuthAngle: H5T_NATIVE_FLOAT + SatelliteZenithAngle: H5T_NATIVE_FLOAT + SatelliteAzimuthAngle: H5T_NATIVE_FLOAT + Height: H5T_NATIVE_FLOAT + SatelliteRange: H5T_NATIVE_FLOAT + SCPosition: H5T_NATIVE_FLOAT + SCVelocity: H5T_NATIVE_FLOAT + SCAttitude: H5T_NATIVE_FLOAT + QF1_SCAN_VIIRSAEROGEO: H5T_NATIVE_UCHAR + QF2_VIIRSAEROGEO: H5T_NATIVE_UCHAR

Figure: 5.1.7-1 VIIRS Aerosol Geolocation UML Diagram

5.1.8 VIIRS Aerosol Geolocation HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Aerosol Geolocation product are listed in the JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms (474-00448-02-01). The VIIRS Aerosol Geolocation metadata includes all common metadata at the root, product, aggregation, and granule levels. In addition to the common metadata items for this product, Table 5.1.8-1, VIIRS Aerosol Geolocation Quality Summary Metadata Values, provide the following items as name/value pairs under the granule level metadata attribute "N_Quality_Summary."

Table: 5.1.8-1 VIIRS Aerosol Geolocation Quality Summary Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Comments**
Percent Missing Data	0 - 100	Contains the percentage of missing data equal to the quotient of the number of cells with no Aerosol Value set due to missing data over the total number of cells in the granule.	This is a granule level quality flag.
Percent Out of Bounds Data	0 - 100	Contains the percentage of out of bounds data equal to the quotient of the number of cells with out of bounds data over the total number of cells in the granule.	This is a granule level quality flag.

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

N_Quality_Summary			
Automatic Quality Flag	0 - 1	Flag displays 0 for 'Retrieval Successful' and 1 for 'Retrieval not Successful'(one or more geolocation subroutines failed)	This is a granule level quality flag.

5.2 Suspended Matter

Data Mnemonic	EDRE-VRSM-C0030 (Official) EDRE-VRSM-C0031 (Substitute)
Description/ Purpose	Suspended matter is defined as dust, sand, volcanic ash, sea salt, smoke, and radioactive smoke in the atmosphere. The retrieval algorithm combines the unique spectral properties of each type of suspended matter with aerosol optical thickness, particle size parameter, and geolocation to classify the suspended matter globally. This EDR will be produced from all nominal JPSS-1 orbits, but the measurement accuracy for a terminator orbit will be degraded due to VIIRS calibration limitations. The Suspended Matter EDR is produced at a 1.6 km resolution. Sensors: VIIRS Effectivity: S-NPP and JPSS-1
File-Naming Construct	See the JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4 for details.
File Size	Estimated Granule Size: See Table: 5.2.1-1 Suspended Matter Data Content Summary for size This granule size includes VIIRS Suspended Matter related fields and quality flags only. Geolocation and metadata attributes are not included. Additional size added by HDF5 packaging is also not included.
File Format Type	HDF5
Data Content and Data Format	See Section 5.2.1, Suspended Matter Data Content Summary See Section 5.2.2, Suspended Matter Product Profile See Section 5.2.3, Suspended Matter HDF5 Details See Section 5.2.4, Suspended Matter HDF5 Metadata Details See Section 5.2.5, Suspended Matter Geolocation Details

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

5.2.1 Suspended Matter Data Content Summary

Table: 5.2.1-1 Suspended Matter Data Content Summary

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
SuspendedMatterType	Suspended Matter Type Index	unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
SmokeConcentration	SmokeConcentration	unsigned 16-bit integer	[N*768, 3200]	[768, 3200]	micrograms / m3
QF1_VIIRSSusMatEDR	Suspended Matter Quality Flags	unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF2_VIIRSSusMatEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF3_VIIRSSusMatEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
SmokeConcentrationFactors	A 32-bit floating point array consisting of two elements: the first is the scale value, the second is the offset value	32-bit floating point	[N*2]	[2]	Scale = unitless; Offset = micrograms / m3
File Size	**14,745,608 Bytes**				

5.2.2 Suspended Matter Product Profile

Table: 5.2.2-1 VIIRS Suspended Matter Product Profile

VIIRS Suspended Matter Product Profile

Fields

Name	Data Size	Dimensions
SuspendedMatterType	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type
Suspended Matter Type Index	0	MIN_VAL	MAX_VAL	unitless	No		unsigned 8-bit char

Fill Values

Name	Value
NA_UINT8_FILL	255
MISS_UINT8_FILL	254
ONBOARD_PT_UINT8_FILL	253
ONGROUND_PT_UINT8_FILL	252
ERR_UINT8_FILL	251
ELLIPSOID_UINT8_FILL	250
VDNE_UINT8_FILL	249

Legend Entries

Name	Value
Ash	0
Dust	1
Smoke	2
Sea Salt	3
Unknown	4
None	5

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SmokeConcentration	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**										
		AlongTrack	Yes	No	768	768										
		CrossTrack	No	No	3200	3200										
		Datum														
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**				
		SmokeConcentration	0	-1.00	2000.00	micrograms / m3	Yes	SmokeConcentrationFactors	unsigned 16-bit integer	**Name**	**Value**	**Name**	**Value**			
										NA_UINT16_FILL	65535					
										MISS_UINT16_FILL	65534					
										ONBOARD_PT_UINT16_FILL	65533					
										ONGROUND_PT_UINT16_FILL	65532					
										ERR_UINT16_FILL	65531					
										ELLIPSOID_UINT16_FILL	65530					
										VDNE_UINT16_FILL	65529					
										SOUB_UINT16_FILL	65528					

VIIRS Suspended Matter Product Profile - Quality Flags

Fields

Name	**Data Size**	**Dimensions**																
QF1_VIIRSSusMatEDR	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**												
		AlongTrack	Yes	No	768	768												
		CrossTrack	No	No	3200	3200												
		Datum																
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**						
		Suspended Matter Detection Product Quality	0	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	**Name**	**Value**	**Name**	**Value**					
												Not Retrieved	0					
												Low Quality	1					
												Medium Quality	2					
												High Quality	3					
		Suspended Matter Type Product Quality	2	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	**Name**	**Value**	**Name**	**Value**					
												No Quality	0					
												Low Quality	1					
												Medium Quality	2					
												High Quality	3					
		Smoke Concentration Product Quality	4	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	**Name**	**Value**	**Name**	**Value**					
												No Quality	0					
												Low Quality	1					
												Medium Quality	2					
												High Quality	3					
		Land/Ocean/Not Produced	6	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	**Name**	**Value**	**Name**	**Value**					
												Land Present	0					
												Ocean Present	1					
												Not Produced	3					
QF2_VIIRSSusMatEDR	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**												
		AlongTrack	Yes	No	768	768												
		CrossTrack	No	No	3200	3200												
		Datum																
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**						
		Cloud Contamination in Cell	0	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**					
												Quality Not Degraded (Confidently Clear or probably clear)	0					
												Quality Degraded	1					
		Cloud Adjacent to Cell	1	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**					
												Quality Not Degraded (Confidently Clear)	0					
												Quality Degraded	1					

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

		Cirrus Contamination in Cell	2	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value No Thin Cirrus 0 Thin Cirrus 1
		Bad SDR	3	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		Sun Glint in Cell	4	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		Cloud Shadow in Cell	5	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value No Cloud Shadow 0 Cloud Shadow 1
		Snow/Ice in Cell	6	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value No Snow/Ice 0 Snow/Ice 1
		Fire Detected in Cell	7	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
QF3_VIIRSSusMatEDR	1byte(s)										

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Smoke Concentration Out of Expected Range	0	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Excluded Typing for AOT at 550nm < 1.0	1	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Excluded Detection for AOT at 550nm < 0.5	2	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Low Sun Exclusion - SZA > 65 degrees	3	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Bright Surface in horizontal cell (Over Land only); Shallow or Turbid Water in horizontal cell (Over Ocean only)	4	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
spare	5	MIN_VAL	MAX_VAL	unitless	No		3 bit(s)	Name Value	Name Value

VIIRS Suspended Matter Product Profile - Scale Factors

Fields

Name	Data Size	Dimensions
SmokeConcentrationFactors	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	2	2

Datum

		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Scale = first array element; Offset = 2nd array element	0	MIN_VAL	MAX_VAL	Scale = unitless; Offset = micrograms / m3	No		32-bit floating point	Name	Value	Name	Value

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

5.2.3 Suspended Matter HDF5 Details

Figure 5.2.3-1 provides detail on the contents and data types of the VIIRS Suspended Matter EDR product. This UML diagram provides details at the product level only. In addition to this UML diagram, refer to Figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

The VIIRS Suspended Matter product within the HDF5 file can be found within the Data_Product group with the group name of VIIRS-SusMat-EDR. The aggregation and granule(s) contain the data fields listed in the UML. The corresponding HDF5 data type for each field is also provided.

VIIRS-SusMat-EDR
+ SuspendeMatter Type: H5T_NATIVE_UCHAR
+ SmokeConcentration: H5T_NATIVE_USHORT
+ QF1_VIIRSSusMatEDR: H5T_NATIVE_UCHAR
+ QF2_VIIRSSusMatEDR: H5T_NATIVE_UCHAR
+ QF3_VIIRSSusMatEDR: H5T_NATIVE_UCHAR
+ SmokeConcentrationFactor: H5T_NATIVE_FLOAT

Figure: 5.2.3-1 VIIRS Suspended Matter HDF5 UML Diagram

5.2.4 Suspended Matter HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Suspended Matter EDR are listed in the JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms (474-00448-02-01). The VIIRS Suspended Matter EDR metadata includes all common metadata at the root, product, aggregation, and granule levels. In addition to the common metadata items for this product, Table 5.2.4-1, VIIRS Suspended Matter Quality Summary Metadata Values, provide the following items as name/value pairs.

Table: 5.2.4-1 VIIRS Suspended Matter Quality Summary Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Comments**
Summary Suspended Matter Product Quality	0 - 100	Percent of Pixels with high quality Suspended Matter Detection Retrieval	This is a granule level quality flag.
Typing Product Quality	0 - 100	Percent of Pixels with high quality Suspended Matter Typing Retrieval	This is a granule level quality flag.
Typing Exclusion Summary	0 - 100	Percent of pixels with “LOW QUALITY” or “NO QUALITY” Suspended Matter Typing Product Quality	This is a granule level quality flag.
Detection Exclusion Summary	0 - 100	Percent of pixels with “LOW QUALITY” or “NO	This is a granule level quality flag.

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N_Quality_Summary			
		QUALITY" Suspended Matter Detection Product Quality	

5.2.5 Suspended Matter Geolocation Details

The VIIRS Suspended Matter is produced on the VIIRS Moderate Resolution Geolocation - Terrain Corrected. See the 474-00448-02-06 JPSS Algorithm Specification Volume II: Data Dictionary for VIIRS RDR/SDR, Section 6.2.5, geolocation details.

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

6 Ancillary and Auxiliary Data Inputs

Not Applicable

7 Look-up Tables and Processing Coefficient Tables

The template used for these formats in this document is described below.

Data Mnemonic: This is a unique identifier. JPSS CDFCB-X Vol. I, 474-00001-01 describes the data mnemonic definition methodology.

Description/Purpose: A brief description of the data format and its purpose.

Instrument: Identification of the Instrument associated with the table.

File-Naming Construct: A description of the file-naming constructs for those data units that apply. JPSS CDFCB-X Vol. I, 474-00001-01 defines file-naming conventions.

File Size: The size of the data file.

File Format Type: The format type of the data file.

Production Frequency: Production frequency is the interval of time for data generation. A production frequency equal to dynamic implies that it is only as requested or as needed.

Data Format/Structure: This defines the actual data format. The definitions provide information for every data element in the data unit.

The following rules apply to all tables:

1. All field names mandatory, unless specified otherwise.
2. Fill data is specified, where applicable.
3. Strings are left-aligned and integers are right-aligned, unless specified otherwise.
4. For information regarding Coordinated Universal Time (UTC) and IDPS Epoch Time (IET) conventions, see the JPSS CDFCB-X Vol. I, 474-00001-01.
5. For all references of the ASCII Standard, the corresponding International Standards Organization (ISO) standard is ISO/IEC 10646. The specific Unicode is UTF8, unless stated otherwise.
6. The fields are presented in order (either top - down or most significant first), unless stated otherwise.

7.1 Aerosol EDR Look-Up Tables (LUTs)

Algorithm Look-up Table (LUT) files contain tables of pre-computed values used in lieu of real-time algorithm computations to reduce processing resource demands. Table values are typically the result of RTM executions and other environmental model simulations. These data generally cover broad, multi-dimensional parameter spaces which are unique to each algorithm.

7.1.1 VIIRS Aerosol Optical Thickness LUT

Data Mnemonic	NP_NU-LM0040-000
Description/ Purpose	The VIIRS Aerosol Optical Thickness (AOT) LUT file contains transmittances (used for both upward and downward), spherical albedo, ratios of AOT at the VIIRS band wavelengths to AOT at 550 nm and

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	atmospheric reflectance. Contains values for all land and ocean aerosol models. This file is used in the VIIRS AOT algorithm.
File-Naming Construct	See the File-Naming Convention for Auxiliary Data Formats, JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4. The Collection Short Name used in the filename is based on the table - see the JPSS CDFCB-X Vol. I, 474-00001-01, for the applicable Collection Short Names. Version Number Field provides Provenance Version Identifier.
File Size	See Table: 7.1.1-1 VIIRS AOT LUT Data Format for size
File Format Type	Little Endian Binary
Production Frequency	As needed
Data Content and Data Format	For details see Table 7.1.1-1, VIIRS AOT LUT Data Format.

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

Table: 7.1.1-1 VIIRS AOT LUT Data Format

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
szen	168	64-bit floating point	0 - 1.3962634	radians	1 Dimensional Array: SOL_ZEN_DIM Size of Dimension(s): 21
vzen	160	64-bit floating point	0 - 1.21455298	radians	1 Dimensional Array: SAT_ZEN_DIM Size of Dimension(s): 20
aot	60	32-bit floating point	0 - 2	unitless	1 Dimensional Array: AOT_DIM Size of Dimension(s): 15
band	44	unsigned 32-bit integer	0 - 9	unitless	1 Dimensional Array: BANDS_DIM Size of Dimension(s): 11
scat_ang_val	1680	32-bit integer	0 - 5491	unitless	1 Dimensional Array: SCAT_ANG_VAL_DIM Size of Dimension(s): 420
trans	176400	32-bit floating point	0 - 1	unitless	4 Dimensional Array: AERO_MOD_DIM x AOT_DIM x BAND_DIM x SOL_ZEN_DIM Size of Dimension(s): 14 x 15 x 10 x 21
albedo	8400	32-bit floating point	0 - 1	unitless	3 Dimensional Array: AERO_MOD_DIM x AOT_DIM x BAND_DIM Size of Dimension(s): 14 x 15 x 10
atau	8400	32-bit floating point	0 - 2	unitless	3 Dimensional Array: AERO_MOD_DIM x AOT_DIM x BAND_DIM Size of Dimension(s): 14 x 15 x 10
reflec	46426800	32-bit floating point	0 - 10	unitless	4 Dimensional Array: AERO_MOD_DIM x AOT_DIM x BAND_DIM x SCAT_ANG_DIM Size of Dimension(s): 14 x 15 x 10 x 5527
scat_ang_incr	8	64-bit floating point	0 - 0.06981317	unitless	

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
File Size	**46,622,120 Bytes**				

7.1.2 VIIRS Aerosol Optical Thickness Sunglint LUT

Data Mnemonic	NP_NU-LM0040-001
Description/ Purpose	The VIIRS AOT Sunglint LUT file contains the normalized integral of downward irradiance by sunglint directional reflectance (also used for normalized integral of upward radiance by sunglint directional reflectance). This file is used in the AOT algorithm.
File-Naming Construct	See the File-Naming Convention for Auxiliary Data Formats, JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4. The Collection Short Name used in the filename is based on the table - see the JPSS CDFCB-X Vol. I, 474-00001-01, for the applicable Collection Short Names. Version Number Field provides Provenance Version Identifier.
File Size	See Table 7.1.2-1 VIIRS AOT Sunglint LUT Data Format for size
File Format Type	Little Endian Binary
Production Frequency	As needed
Data Content and Data Format	For details see Table 7.1.2-1, VIIRS AOT Sunglint LUT Data Format.

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

Table: 7.1.2-1 VIIRS AOT Sunglint LUT Data Format

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
szen	168	64-bit floating point	0 - 1.3962634	radians	1 Dimensional Array: SG_SOL_ZEN_DIM Size of Dimension(s): 21
vzen	168	64-bit floating point	0 - 1.3962634	radians	1 Dimensional Array: SG_SEN_ZEN_DIM Size of Dimension(s): 21
relaz	168	64-bit floating point	0 - 3.14159265	radians	1 Dimensional Array: SG_REL_AZI_DIM Size of Dimension(s): 21
aot	60	32-bit floating point	0 - 2	unitless	1 Dimensional Array: SG_AOT_DIM Size of Dimension(s): 15
rhobar	30005640	32-bit floating point	0 - 1	unitless	6 Dimensional Array: SG_AER_MOD_DIM x SG_AOT_DIM x SG_BAND_DIM x SG_SOL_ZEN_DIM x SG_SEN_ZEN_DIM x SG_REL_AZI_DIM Size of Dimension(s): 9 x 15 x 6 x 21 x 21 x 21
pad	4	unsigned 8-bit	N/A	unitless	1 Dimensional Array: SG_PAD_DIM Size of Dimension(s): 4
File Size	**30,006,208 Bytes**				

7.2 Processing Coefficient Tables

The S-NPP/JPSS-1 ground system data product generation subsystem uses Processing Coefficient Table (PCT) file parameters. PCT files can be either Automated or Manual coefficient tables. Within the Manual table type are two coefficient classes: Initial and Ephemeral. Sections below describe all three and any tables of that type for the product.

7.2.1 Automated Processing Coefficients

Automated Processing Coefficient (PC) files contain parameters updated and/or created during the processing of the S-NPP/JPSS Data Products by the processing algorithms. The processing environment subsequently uses these files without human review of their contents. Files can be used immediately after creation or in future processing such as the next granule in the production data stream processing.

7.2.1.1 Aerosol EDR Automated PCs

The Aerosol EDR product currently uses no Automated PCs.

7.2.2 Manual Processing Coefficients

Manual Processing Coefficient (PC) files contain parameters used for S-NPP/JPSS Data Product generation which require human review prior to operational processing environment insertion. Manual Processing Coefficients have two classes:

- Initialization PCTs contain infrequently updated initial parameters sets S-NPP/JPSS uses for data product generation.
- Ephemeral PCTs contain frequently updated parameters sets S-NPP/JPSS uses for data product generation

7.2.2.1 Aerosol EDR Initialization PCs

The Aerosol EDR product currently uses no Initialization PCs.

7.2.2.2 VIIRS Aerosol EDR Ephemeral PCT

Data Mnemonic	DP_NU-LM2020-010
Description/ Purpose	The VIIRS Aerosol EDR Ephemeral PC provides tunable processing coefficients for use by the algorithm during execution. The coefficients can be modified (tuned) through a configuration control process in response to algorithm, performance, inputs, sensitivity, etc. changes. The ephemeral water threshold will be present but not used.
File-Naming Construct	See the File-Naming Convention for Auxiliary Data Formats, JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4. The Collection Short Name used in the filename is based on the table - see the JPSS CDFCB-X

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	Vol. I, 474-00001-01, Table B-1 for the applicable Collection Short Names.
File Size	See Table 7.2.2.2-1 VIIRS Aerosol EDR Ephemeral PC Data Format for size
File Format Type	Little Endian Binary
Production Frequency	As needed
Data Content and Data Format	For details see Table 7.2.2.2-1, VIIRS Aerosol EDR Ephemeral PC Data Format

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

Table: 7.2.2.2-1 VIIRS Aerosol EDR Ephemeral PC Data Format

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
deltaClimo	8	64-bit floating point	0 - 1000	unitless	
Solird	8	64-bit floating point	0 - 1000	mW/(m^2/cm)	Solar Irradiance
Esnorm	8	64-bit floating point	0 - 1000	unitless	Earth Sun Normalization Factor
r375thsh	8	64-bit floating point	0 - 1000	radians	Solar Zenith threshold for 3.75 refl calculation
Sttsh	8	64-bit floating point	0 - 1000	K	Surface Temperature Threshold
stcoeff1	32	64-bit floating point	0 - 1000	unitless	Surface Temp. Coeffs 1 Dimensional Array: AOT_SFCTEMP_DIM Size of Dimension(s): 4
stcoeff2	32	64-bit floating point	0 - 1000	unitless	Surface Temp. Coeffs 1 Dimensional Array: AOT_SFCTEMP_DIM Size of Dimension(s): 4
Sgcoeff	80	64-bit floating point	0 - 1000	unitless	Band Dependent Sunglint Refl. Coeffs 1 Dimensional Array: AOT_SG_REFL_DIM Size of Dimension(s): 10
Vracoeff	8	64-bit floating point	0 - 1000	unitless	Visible Reflectance Anomaly Coeff
Vrathsh	8	64-bit floating point	0 - 1000	unitless	Visible Reflectance Anomaly Thresh
miracoeff1	8	64-bit floating point	0 - 1000	unitless	Middle Infrared Reflectance Anomaly Coeff
miracoeff2	8	64-bit floating point	0 - 1000	unitless	Middle Infrared Reflectance Anomaly Coeff
Mirathsh	8	64-bit floating point	0 - 1000	unitless	Middle Infrared Reflectance Anomaly threshold
cirrus1	8	64-bit floating point	0 - 1000	unitless	Cirrus M9 Reflectance Threshold

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
cirrus2	8	64-bit floating point	0 - 1000	K	Cirrus Surface Temp. Diff. Threshold
Sungt	8	64-bit floating point	0 - 1000	K	Sunglint over Land Surface Temp. Diff. Threshold
Firethsh	8	64-bit floating point	0 - 1000	K	Fire Surface Temp. Diff. Threshold
snowthsh1	8	64-bit floating point	0 - 1000	unitless	Snow M8/M7 Reflectance Threshold
snowthsh2	8	64-bit floating point	0 - 1000	K	Snow Temp Threshold
Icethsh	8	64-bit floating point	0 - 1000	K	Ice Temperature Threshold
ephemeralWaterThsh	8	64-bit floating point	0 - 1000	unitless	NDVI Threshold for ephemeral water test
residualLandThsh	8	64-bit floating point	0 - 1000	unitless	Residual threshold for land models
residualOceanThsh	8	64-bit floating point	0 - 1000	unitless	Residual threshold for ocean models
wvllnd1	8	64-bit floating point	0 - 1000	microns	Land angstrom exponent band wavelengths
wvllnd2	8	64-bit floating point	0 - 1000	microns	Land angstrom exponent band wavelengths
wvlwat1	8	64-bit floating point	0 - 1000	microns	Ocean angstrom exponent band wavelengths
wvlwat2	8	64-bit floating point	0 - 1000	microns	Ocean angstrom exponent band wavelengths
smkco1	8	64-bit floating point	0 - 1000	unitless	Coefficient for Smoke Concentration
smkco2	8	64-bit floating point	0 - 1000	unitless	Coefficient for Smoke Concentration
minsmkco	8	64-bit floating point	0 - 1000	micro gram/m^3	Minimum value of Smoke Concentration
solarZenithNightThresh	4	32-bit floating point	0 - 1000	radians	Maximum solar zenith angle for daytime classification
solarZenithExclusionThresh	4	32-bit floating point	0 - 1000	radians	Solar zenith angle beyond which retrievals are excluded from performance

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
solarZenithDegradationThresh	4	32-bit floating point	0 - 1000	radians	Solar zenith angle beyond which retrievals are expected to have degraded performance
lambda	44	32-bit floating point	0 - 1000	microns	Band center wavelengths 1 Dimensional array AOT_NBANDS Size of Dimension(s): 11
moltau	44	32-bit floating point	0 - 1000	unitless	Band Rayleigh optical depths 1 Dimensional array AOT_NBANDS Size of Dimension(s): 11
rayrefl	40	32-bit floating point	-50.30925 - 1000	unitless	Rayleigh refl. Coefficients a0, a1, a2, a3, a4, b0, b1, b2, b3, b4 - Vermote and Tanre, 1992 1 Dimensional array AOT_RAYREF_DIM Size of Dimension(s): 10
o3cof	44	32-bit floating point	0 - 1000	unitless	Band ozone optical depths 1 Dimensional array AOT_NBANDS Size of Dimension(s): 11
tgoga0	44	32-bit floating point [11]	-1.0 - 1.0	unitless	Band dependent coefficient for computing constant species gaseous absorption 1 Dimensional array AOT_NBANDS Size of Dimension(s): 11
tgoga1	44	32-bit floating point [11]	-1.0 - 1.0	unitless	Band dependent coefficient for computing constant species gaseous absorption 1 Dimensional array AOT_NBANDS Size of Dimension(s): 11
tgogb0	44	32-bit floating point [11]	-1.0 - 1.0	unitless	Band dependent coefficient for computing constant species gaseous absorption 1 Dimensional array

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
					AOT_NBANDS Size of Dimension(s): 11
tgogb1	44	32-bit floating point [11]	-1.0 - 1.0	unitless	Band dependent coefficient for computing constant species gaseous absorption 1 Dimensional array AOT_NBANDS Size of Dimension(s): 11
tgogc0	44	32-bit floating point [11]	-1.0 - 1.0	unitless	Band dependent coefficient for computing constant species gaseous absorption 1 Dimensional array AOT_NBANDS Size of Dimension(s): 11
tgogc1	44	32-bit floating point [11]	-1.0 - 1.0	unitless	Band dependent coefficient for computing constant species gaseous absorption 1 Dimensional array AOT_NBANDS Size of Dimension(s): 11
pwcof1	44	32-bit floating point	-50.003174 - 1000	unitless	Band dependent coefficient for computing water vapor gaseous absorption 1 Dimensional array AOT_NBANDS Size of Dimension(s): 11
pwcof2	44	32-bit floating point	-50.003834 - 1000	unitless	Band dependent coefficient for computing water vapor gaseous absorption 1 Dimensional array AOT_NBANDS Size of Dimension(s): 11
pwcof3	44	32-bit floating point	0 - 1000	unitless	Band dependent coefficient for computing water vapor gaseous absorption 1 Dimensional array AOT_NBANDS Size of Dimension(s): 11

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
turbThsh	44	32-bit floating point	0 - 1000	unitless	Band dependent turbid water thresholds 1 Dimensional array AOT_NBANDS Size of Dimension(s): 11
planckco	8	32-bit floating point	0 - 1000		Coefficients for Planck function 1 Dimensional array AOT_PLANCK_DIM Size of Dimension(s): 2
emissco	12	32-bit floating point	0 - 1000	unitless	Emissivity Coefficients 1 Dimensional array AOT_EMISS_DIM Size of Dimension(s): 3
transco	20	32-bit floating point	-50.057297 - 1000	unitless	Transmission Coeffs 1 Dimensional array AOT_TRANS_DIM Size of Dimension(s): 5
residualAotThsh	4	32-bit floating point	0 - 1000	unitless	Minimum AOT value for residual threshold test
aotrnglo	4	32-bit floating point	0 - 1000	unitless	Lower limit of high quality AOT retrievals
aotrnghi	4	32-bit floating point	0 - 1000	unitless	Upper limit of high quality AOT retrievals
foutlo	4	32-bit floating point	0 - 1000	unitless	EDR HCS outlier removal fractions
fouthi	4	32-bit floating point	0 - 1000	unitless	EDR HCS outlier removal fractions
erelc	20	32-bit floating point	-50.057297 - 1000	unitless	Expected spectral ratios of land bands to M5 1 Dimensional Array: NUMBER_OF_LAND_INV_BANDS Size of Dimension(s): 5
aotThsh	4	32-bit floating point	0 - 1000	unitless	AOT at 550 nm threshold for reporting the presence of suspended matter
detectExcThsh	4	32-bit floating point	0 - 1000	unitless	AOT at 550 nm exclusion threshold for detecting suspended matter
typeExcThsh	4	32-bit floating point	0 - 1000	unitless	AOT at 550 nm exclusion threshold for typing suspended matter

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
distClimo	4	32-bit integer	0 - 1000	unitless	Distance for interpolating NAAPS/Climatology
defaultLandClimo	4	32-bit integer	0 - 1000	unitless	Default land model for NAAPS/Climatology/Interpolation
defaultOceanClimo	4	32-bit integer	0 - 1000	unitless	Default ocean model for NAAPS/Climatology/Interpolation
smlmdoff	4	32-bit integer	0 - 1000	unitless	Model offset for ocean small mode models
lrgmdoff	4	32-bit integer	0 - 1000	unitless	Model offset for ocean large mode models
dustmdl	4	32-bit integer	0 - 1000	unitless	Land Aerosol Model Definition - Dust
smokehimdl	4	32-bit integer	0 - 1000	unitless	Land Aerosol Model Definition - High absorption smoke
smokelomdl	4	32-bit integer	0 - 1000	unitless	Land Aerosol Model Definition - Low absorption smoke
urbancmdl	4	32-bit integer	0 - 1000	unitless	Land Aerosol Model Definition - Urban clean
urbanpmdl	4	32-bit integer	0 - 1000	unitless	Land Aerosol Model Definition - Urban polluted
SpaFilThsh	8	64-bit floating point	0 -1000	unitless	Spatial Filter Threshold for Homogeneity Test
ndsiSnowThsh	8	64-bit floating point	0 -1000	unitless	Normalized Difference Snow Index Threshold for Snow Test
btSnowThsh	8	64-bit floating point	0 -1000	K	Brightness Temperature Threshold for Snow Test
implicit_pad0	4	unsigned 8-bit integer	-MIN_VAL - MAX_VAL	unitless	Pad Bytes 1 Dimensional Array: dim_implicit_aeros_pad0 Size of Dimension(s): 4
File Size	**1,144 Bytes**				

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

Appendix A. Data Mnemonic to Interface Mapping

For a complete list of Data Mnemonic to Interface Mapping, see 474-00001-01, JPSS CDFCB-X Vol I. The CDFCB contains Data Mnemonics, Identifiers, Collection Short Names, Interface Documents, and Collection Long Names for each JPSS Data Product and for Geolocation data.

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

Appendix B. DQTT Quality Flag Mapping

The following table maps the quality flags by sensor and product that are reportable to the associated data product quality flag Test ID used in the processing environment.

Table: B-1 DQTT Quality Flag Mapping

Algorithm	Product	Test ID	Quality Flag
Aerosol Optical Thickness	VIIRS-Aeros-EDR	1000	AOT Summary Quality
Aerosol Optical Thickness	VIIRS-Aeros-EDR	1002	APSP Summary Quality
Aerosol Optical Thickness	VIIRS-Aeros-EDR	1001	AOT Exclusion Summary
Aerosol Optical Thickness	VIIRS-Aeros-EDR	1003	APSP Exclusion Summary
Aerosol Particle Suspended Matter	VIIRS-SusMat-EDR	1200	Summary Suspended Matter Product Quality
Aerosol Particle Suspended Matter	VIIRS-SusMat-EDR	1201	Detection Exclusion Summary
Aerosol Particle Suspended Matter	VIIRS-SusMat-EDR	1202	Typing Product Quality
Aerosol Particle Suspended Matter	VIIRS-SusMat-EDR	1203	Typing Exclusion Summary

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

Appendix C. Abbreviations and Acronyms

See 470-00041 JPSS Program Lexicon for abbreviations and acronyms.

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

Attachment A. XML Formats for Related Products

Table: ATT-1 XML Formats for Related Products

File Number	File Name
1	474-00448-02-12_JPSS-Aerosol-DD-Part-12_0200D_VIIRS-Aeros-EDR-PP.xml
2	474-00448-02-12_JPSS-Aerosol-DD-Part-12_0200D_VIIRS-SusMat-EDR-PP.xml
3	474-00448-02-12_JPSS-Aerosol-DD-Part-12_0200D_VIIRS-Aeros-Opt-Thick-IP-PP.xml
4	474-00448-02-12_JPSS-Aerosol-DD-Part-12_0200D_VIIRS-Aeros-Modl-Info-IP-PP.xml
5	474-00448-02-12_JPSS-Aerosol-DD-Part-12_0200D_VIIRS-Aeros-EDR-GEO-PP.xml

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.