

**GSFC JPSS CMO
January 9, 2015
Released**

Effective Date: October 23, 2014
Block/Revision 0200B

**Joint Polar Satellite System (JPSS) Ground Project
Code 474
474-00448-02-18-B0200**

**Joint Polar Satellite System (JPSS)
Algorithm Specification Volume II: Data
Dictionary for the Vegetation Index**

Block 2.0.0



National Aeronautics and
Space Administration

**Goddard Space Flight Center
Greenbelt, Maryland**

Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Vegetation Index 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
0200-	Aug 8, 2013	This version incorporates 474-CCR-13-1121 which was approved on the effective date shown.	All
0200A	Jan 23, 2014	This version incorporates 474-CCR-13-1429 which was approved by JPSS Ground ERB on the effective date shown.	All
Rev 0200A1	Oct 23, 2014	This version incorporates 474-CCR-14-2091 which was approved by the JPSS Ground ERB for CO10 on the effective date shown.	All
Rev 0200B	Oct 23, 2014	This version incorporates 474-CCR-14-2075 which was approved by the JPSS Ground ERB on the effective date shown.	All

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 Vegetation Index - Volume II: Data Dictionary contains the specifications for the format of the Vegetation Index 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 the 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
Acronyms/Glossary	Reference 470-00041, JPSS Program Lexicon
Attachment A	Lists relevant xml files associated with this Data Dictionary

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
470-00067	Joint Polar Satellite System (JPSS) Ground System Requirements Document (GSRD)
470-00067-02	Joint Polar Satellite System (JPSS) Ground System Requirements Document (GSRD), Volume 2 – Science Product Specifications
474-00448-01-01	Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirements Specification (SRS) for the Common Algorithms

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
474-00039	Joint Polar Satellite System (JPSS) VIIRS Vegetation Index (VVI) Algorithm Theoretical Basis Document (ATBD)
474-00448-03-18	Joint Polar Satellite System (JPSS) Algorithm Specification Volume III:

Document Number	Title
	Operational Algorithm Description (OAD) for the Vegetation Index
474-00333	Joint Polar Satellite System (JPSS) Ground System (GS) Architecture Description Document (ADD)
474-00054	Joint Polar Satellite System (JPSS) Ground System (GS) Concept of Operations (ConOps)
470-00041	Joint Polar Satellite System (JPSS) Program Lexicon
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

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.

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".

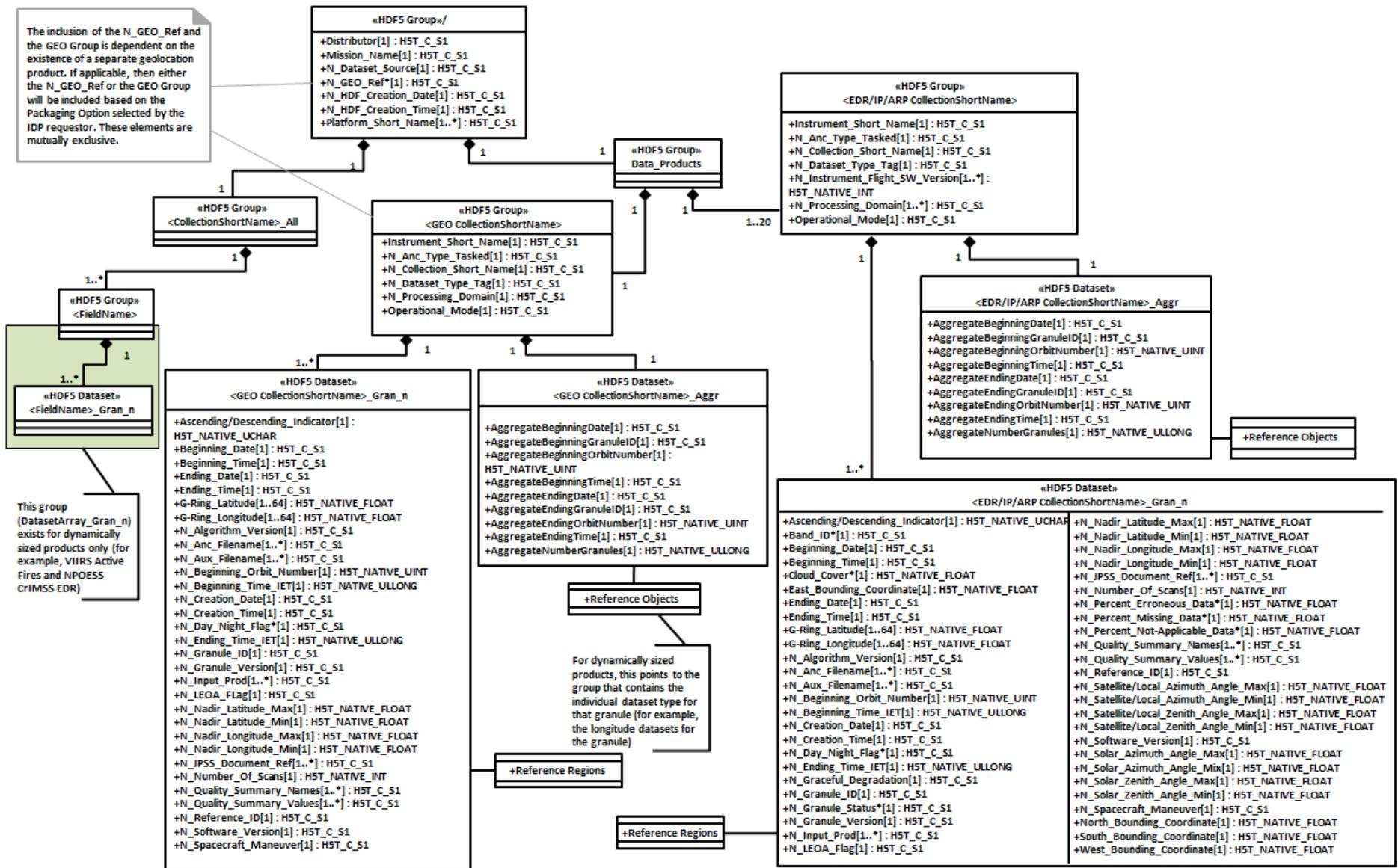


Figure: 3.2-1 Generalized UML Diagram for dynamically sized HDF5 IP/EDR Files

4 Intermediate Products (IPs)

Not Applicable

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 II. 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 Vegetation Index EDR

Data Mnemonic	EDRE-VRVI-C0030 (Official) EDRE-VRVI-C0031 (Substitute)
Description/ Purpose	<p>Normalized Difference Vegetation Index (NDVI) - Top of the Atmosphere (TOA) is most directly related to absorption of photo synthetically active radiation, but is often correlated with biomass or primary productivity. Red spectral measurements are sensitive to the chlorophyll content of vegetation and the near IR to the mesophyll structure of leaves. The normalized ratio (IR-Red)/(IR+ Red) has a close relationship with the photosynthetic capacity of specific vegetation types.</p> <p>TOA NDVI is defined as follows: $NDVI_{TOA} = (I2_{TOA} - I1_{TOA}) / (I2_{TOA} + I1_{TOA})$ Spectral bands I1 and I2 are 600 - 680 nm and 845.5 - 884.5 nm respectively. TOA subscripts indicate that the values used are TOA reflectance in the respective bands.</p> <p>The Vegetation Index EDR also contains a Top of the Canopy (TOC) NDVI. The statement about the input bands still holds. TOC NDVI is defined as follows: $NDVI_{TOC} = (I2_{TOC} - I1_{TOC}) / (I2_{TOC} + I1_{TOC})$ Spectral bands I1 and I2 are 600 - 680 nm and 845.5 - 884.5 nm respectively. TOC subscripts indicate that the values used are TOC reflectance in the respective bands.</p> <p>The Vegetation Index EDR also contains a TOC Enhanced Vegetation Index (EVI) which is defined as $EVI = (1 + L) * [(I_{NIR} - I_{Red}) / (I_{NIR} + C_1 I_{Red} - C_2 I_{Blue} + L)]$</p>

	<p>where L is a constant to adjust for soil background brightness, and C_1 and C_2 are constants derived from minimizing feedback and errors from soil and atmospheric effects. For VIIRS, $C_1 = 6$, $C_2 = 7.5$, and $L=1$.</p> <p>Γ_{NIR} is the I2 band and TOC reflectance at 865nm Γ_{Red} is the I1 band and TOC reflectance at 640nm Γ_{Blue} is the M3 band and TOC reflectance at 488nm The M3 band has twice the cell size as the I1 and I2 bands, so its value is applied to the 4 horizontal cells.</p> <p>Sensors: VIIRS Effectivity: S-NPP and JPSS</p>
File-Naming Construct	See the JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4 for details.
File Size	<p>Estimated Granule Size: See Table: 5.1.1-1 VIIRS Vegetation Index Data EDR Data Content Summary for size</p> <p>This granule size includes VIIRS Vegetation Index related fields and quality flags only. Geolocation and metadata attributes are not included. Additional size added by HDF5 packaging is also not included.</p>
File Format Type	HDF5
Data Content and Data Format	<p>See Section 5.1.1, VIIRS Vegetation Index Data Content Summary</p> <p>See Section 5.1.2, VIIRS Vegetation Index Product Profile</p> <p>See Section 5.1.3, VIIRS Vegetation Index HDF5 Details</p> <p>See Section 5.1.4, VIIRS Vegetation Index HDF5 Metadata Details</p> <p>See Section 5.1.5, VIIRS Vegetation Index Geolocation Details</p>

5.1.1 VIIRS Vegetation Index Data EDR Data Content Summary**Table: 5.1.1-1 VIIRS Vegetation Index Data EDR Data Content Summary**

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
TOA_NDVI	Normalized Difference Vegetation Index - Top of Atmosphere	unsigned 16-bit integer	[N*1536, 6400]	[1536, 6400]	unitless
TOC_NDVI	Normalized Difference Vegetation Index - Top of Canopy	unsigned 16-bit integer	[N*1536, 6400]	[1536, 6400]	unitless
TOC_EVI	Enhanced Vegetation Index - Top of Canopy	unsigned 16-bit integer	[N*1536, 6400]	[1536, 6400]	unitless
QF1_VIIRSVIEDR	Pixel Level Quality Flags	unsigned 8-bit char	[N*1536, 6400]	[1536, 6400]	unitless
QF2_VIIRSVIEDR		unsigned 8-bit char	[N*1536, 6400]	[1536, 6400]	unitless
QF3_VIIRSVIEDR		unsigned 8-bit char	[N*1536, 6400]	[1536, 6400]	unitless
QF4_VIIRSVIEDR		unsigned 8-bit char	[N*1536, 6400]	[1536, 6400]	unitless
TOA_NDVI_Factors	Scale = First Array Element; Offset = 2nd Array Element	32-bit floating point	[N*2]	[2]	unitless
TOC_NDVI_Factors	Scale = First Array Element; Offset = 2nd Array Element	32-bit floating point	[N*2]	[2]	unitless
TOC_EVI_Factors	Scale = First Array Element; Offset = 2nd Array Element	32-bit floating point	[N*2]	[2]	unitless
File Size	68,812,816 Bytes				

5.1.2 VIIRS Vegetation Index EDR Product Profile

Table: 5.1.2-1 VIIRS Vegetation Index EDR Product Profile

VIIRS Vegetation Index Product Profile

Fields													
Name	Data Size	Dimensions											
TOA_NDVI	2byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size							
		AlongTrack	Yes	No	1536	1536							
		CrossTrack	No	No	6400	6400							
		Datum											
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Normalized Difference Vegetation Index - Top of Atmosphere	0	-1.00	1.00	unitless	Yes	TOA_NDVI_Factors	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												
TOC_NDVI	2byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size							
		AlongTrack	Yes	No	1536	1536							
		CrossTrack	No	No	6400	6400							
		Datum											
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Normalized Difference Vegetation Index - Top of Canopy	0	-1.00	1.00	unitless	Yes	TOC_NDVI_Factors	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												
ELINT_UINT16_FILL	65530												
VDNE_UINT16_FILL	65529												

Fields											
Name	Data Size	Dimensions									
Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size							
TOC_EVI											
AlongTrack	Yes	No	1536	1536							
CrossTrack	No	No	6400	6400							
Datum											
Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Enhanced Vegetation Index - Top of Canopy	0	-1.00	4.00	unitless	Yes	TOC_EVI_Factors	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 Vegetation Index Product Profile - Quality Flags

Fields											
Name	Data Size	Dimensions									
Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size							
QF1_VIIRSVIE DR	1byte(s)										
AlongTrack	Yes	No	1536	1536							
CrossTrack	No	No	6400	6400							
Datum											
Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Overall NDVI Quality	0	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name	Value	Name	Value
										Low	0
										High	1
Overall EVI Quality	1	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name	Value	Name	Value
										Low	0
										High	1
I1 TOA Reflectance is NOT available	2	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name	Value	Name	Value
										FALSE	0
										TRUE	1
I2 TOA Reflectance is NOT available	3	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name	Value	Name	Value
										FALSE	0
										TRUE	1
I1 Surface Reflectance is NOT available	4	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name	Value	Name	Value

											FALSE	0		
											TRUE	1		
		I2 Surface Reflectance is NOT available	5	MIN_VAL	MAX_VAL	unitless	No			1 bit(s)	Name	Value	Name	Value
											FALSE	0		
											TRUE	1		
		M3 Surface Reflectance is NOT available	6	MIN_VAL	MAX_VAL	unitless	No			1 bit(s)	Name	Value	Name	Value
											FALSE	0		
											TRUE	1		
		EVI Range is out of range (EVI < -1.0 or EVI > 4.0)	7	MIN_VAL	MAX_VAL	unitless	No			1 bit(s)	Name	Value	Name	Value
											FALSE	0		
											TRUE	1		
QF2_VIIRSVIE DR	lbyte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size								
		AlongTrack	Yes	No	1536	1536								
		CrossTrack	No	No	6400	6400								
		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/Water	0	MIN_VAL	MAX_VAL	unitless	No		3 bit(s)	Name	Value	Name	Value	
												Land & Desert	0	
												Land/No Desert	1	
												Inland Water	2	
												Sea Water	3	
												Coastal	5	
		Cloud Confidence	3	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	Name	Value	Name	Value	
												Confidently Clear	0	
												Probably Clear	1	
												Probably Cloudy	2	
												Confidently Cloudy	3	
		Sun Glint in pixel (as indicated in the VIIRS Cloud Mask)	5	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	Name	Value	Name	Value	
												None	0	
												Geometry Based	1	
												Wind-Speed Based	2	
												Geometry & Wind	3	
		Thin Cirrus detected in pixel (from VIIRS Cloud Mask)	7	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name	Value	Name	Value	
												FALSE	0	
												TRUE	1	
QF3_VIIRSVIE DR	lbyte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size								
		AlongTrack	Yes	No	1536	1536								
		CrossTrack	No	No	6400	6400								
		Datum												
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries		

		Stratification - Solar Zenith Angle	0	0	1	unitless	No		1 bit(s)	Name	Value	Name	Value		
													SZA < 65 Degrees	0	
													SZA >= 65 Degrees & SZA <= 85 Degrees	1	
		Excl - AOT > 1	1	0	1			No		1 bit(s)	Name	Value	Name	Value	
														AOT <= 1.0	0
														AOT > 1.0	1
		Excl - Solar Zenith Angle > 85 Deg	2	0	1			No		1 bit(s)	Name	Value	Name	Value	
														SZA <= 85 degrees	0
														SZA > 85 degrees	1
		Snow/Ice	3	0	1			No		1 bit(s)	Name	Value	Name	Value	
														No	0
														Yes	1
		Adjacent Clouds	4	0	1			No		1 bit(s)	Name	Value	Name	Value	
														No	0
												Yes	1		
Aerosol Quantity	5	0	3			No		2 bit(s)	Name	Value	Name	Value			
												Climatology	0		
												Low	1		
												Average	2		
												High	3		
Cloud Shadow	7	0	1			No		1 bit(s)	Name	Value	Name	Value			
												No	0		
												Yes	1		
QF4_VIIRSVIE DR	1byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size									
		AlongTrack	Yes	No	1536	1536									
		CrossTrack	No	No	6400	6400									
		Datum													
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries				
Overall TOC NDVI Quality	0	0	1	unitless	No		1 bit(s)	Name	Value	Name	Value				
										Low	0				
										High	1				
Spare	1	0	1	unitless	No		1 bit(s)	Name	Value	Name	Value				

VIIRS Vegetation Index Product Profile - Scale Factors

Fields												
Name	Data Size	Dimensions										
TOA_NDVI_Factors	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	

TOC_NDVI_Factors	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	
TOC_EVI_Factors	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	

5.1.3 VIIRS Vegetation Index EDR HDF5 Details

Figure 5.1.3-1, VIIRS Vegetation Index HDF5 UML Diagram, provides details on the contents and data types of the Vegetation Index product. This UML provides details at the product level detail only. In addition to this UML, refer to the figure 3.2-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

VIIRS-VI-EDR
+TOA_NDVI : H5T_NATIVE_UINT
+TOC_NDVI: H5T_NATIVE_UINT
+TOC_EVI : H5T_NATIVE_UINT
+QF1_VIIRSVIEDR : H5T_NATIVE_UCHAR
+QF2_VIIRSVIEDR : H5T_NATIVE_UCHAR
+QF3_VIIRSVIEDR : H5T_NATIVE_UCHAR
+QF4_VIIRSVIEDR: H5T_NATIVE_UCHAR
+TOA_NDVI_Factors : H5T_NATIVE_FLOAT
+TOC_NDVI_Factors:H5T_NATIVE_FLOAT
+TOC_EVI_Factors : H5T_NATIVE_FLOAT

Figure: 5.1.3-1 VIIRS Vegetation Index HDF5 UML Diagram

5.1.4 VIIRS Vegetation Index EDR HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Vegetation Index 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 of the 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 Vegetation Index Quality Summary Metadata Values, provides 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 Vegetation Index.

Table: 5.1.4-1 VIIRS Vegetation Index Quality Summary Metadata Values

N_Quality_Summary			
Name	Value	Description	Comments
EVI Summary Quality	0 - 100	Percent of cells with high quality	
NDVI Summary Quality	0 - 100	Percent of cells with high quality	
TOC NDVI Summary Quality	0 - 100	Percent of cells with high quality	TOC NDVI Summary Quality
EVI Exclusion Summary	0 - 100	Percent of pixels with one or more EVI exclusion criteria flags	
NDVI Exclusion Summary	0 - 100	Percent of pixels with one or more NDVI exclusion criteria flags	
TOC-NDVI Exclusion	0 - 100	Percent of pixels with	

N_Quality_Summary			
Summary		one or more NDVI exclusion criteria flags	
No Land in Granule	0 - 1	0 = Land in Granule 1 = No Land in Granule	

5.1.5 VIIRS Vegetation Index EDR Geolocation Details

VIIRS Vegetation Index is produced on the VIIRS Imagery Resolution Geolocation - Terrain Corrected. See the JPSS Algorithm Specification Volume II: Data Dictionary for the VIIRS RDR/SDR (474-00448-02-06), Section 6.3, VIIRS Imagery Resolution Geolocation - Terrain Corrected for details.

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 Look Up Tables

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 Vegetation Index EDR LUTs

The VIIRS Vegetation Index EDR product currently uses no LUTs.

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 VIIRS Vegetation Index EDR Automated PCs

The VIIRS Vegetation Index 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 VIIRS Vegetation Index Initialization PCs

The VIIRS Vegetation Index product currently uses no Initialization PCs.

7.2.2.2 VIIRS Vegetation Index EDR Ephemeral PCT

Data Mnemonic	DP_NU_LM2020-031
Description/ Purpose	The VIIRS Vegetation Index 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.
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, Table B-1 for the applicable Collection Short Names
File Size	See Table 7.2.2.2-1 VIIRS Vegetation Index EDR Ephemeral PCT
File Format Type	Binary
Production Frequency	As needed

Data Content and Data Format	For details see Table 7.2.2.2-1 VIIRS Vegetation Index EDR Ephemeral PCT
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Table: 7.2.2.2-1 VIIRS Vegetation Index EDR Ephemeral PCT

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
EVI_C	4	32-bit floating point	Initially set to 1.0	unitless	Constant used to adjust for the soil background, in the EVI calculation
EVI_I1	4	32-bit floating point	Initially set to 6.0	unitless	constant used in EVI calculation - derived from minimizing feedback and errors from soil and atmospheric effects
EVI_M3	4	32-bit floating point	Initially set to 7.5	unitless	Constant used in EVI calculation - derived from minimizing feedback and errors from soil and atmospheric effects
SZA_LOW	4	32-bit floating point	Initially set to 1.2217304763	radians	Solar Zenith Angle threshold (65degrees) used to set the low/high QF
SZA_HI	4	32-bit floating point	Initially set to 1.4835298641	radians	Solar Zenith Angle threshold (85 degrees) used to set the SZA Exclusion flag
NDVI_MIN	4	32-bit floating point	Initially set to -1.0	unitless	Min allowable value for NDVI. Values less than this are set to FILL
NDVI_MAX	4	32-bit floating point	Initially set to 1.0	unitless	Max allowable value for NDVI. Values greater than this are set to FILL
TOC_NDVI_MIN	4	32-bit floating point	Initially set to -1.0	unitless	Min allowable value for TOC NDVI. Values less than this are set to FILL
TOC_NDVI_MAX	4	32-bit floating point	Initially set to 1.0	unitless	Max allowable value for TOC NDVI. Values greater than this are set to FILL
EVI_MIN	4	32-bit floating point	Initially set to -1.0	unitless	Min allowable value for EVI. Values less than this are set to FILL
EVI_MAX	4	32-bit floating point	Initially set to 4.0	unitless	Max allowable value for EVI. Values greater than this are set to FILL

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
VI_SCALE_FACTOR	4	32-bit integer	Initially set to 10000	unitless	Not currently used in code – scaling is performed outside of VI algorithm
File Size	40 Bytes				

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.

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	TestID	Quality Flag
Vegetation Index	VIIRS-VI-EDR	600	Summary EVI Quality
Vegetation Index	VIIRS-VI-EDR	601	Summary NDVI Quality
Vegetation Index	VIIRS-VI-EDR	602	EVI Exclusion Summary
Vegetation Inde	VIIRS-VI-EDR	603	NDVI Exclusion Summary
Vegetation Index	VIIRS-VI-EDR	604	Summary TOC NDVI Quality
Vegetation Index	VIIRS-VI-EDR	605	TOC NDVI Exclusion Summary

Appendix C. Abbreviations and Acronyms

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

Attachment A. XML Formats for Related Data Products

Table: ATT-1 XML Formats for Related Products

File Number	XML Filename
1	474-00448-02-18_JPSS-VI-DD-Part-18_0200B_VIIRS-VI-EDR-PP.xml