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Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Ocean Color and Chlorophyll

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 Ocean Color and Chlorophyll
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 22, 2013	This version incorporates 474-CCR-13-1159 which was approved by JPSS Ground ERB on the effective date shown.	All
0200A	Jan 09, 2014	This version incorporates 474-CCR-13-1401 which was approved by JPSS Ground ERB on the effective date shown.	All
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
0200B	Jan 07, 2015	This version incorporates 474-CCR-14-2182 which was approved by the JPSS Ground on the effective date shown.	All
0200C	Jul 28, 2015	This version incorporates 474-CCR-15-2288 and 474-CCR-15-2506 which was approved by the JPSS Ground ERB on the effective date shown.	All
0200D	Mar 31, 2016	This version incorporates 474-CCR-15-2657, and 474-CCR-16-2823 which was approved by the JPSS Ground ERB on the effective date shown.	All
0200E	Jun 07, 2016	This version incorporates 474-CCR-16-2939 which was approved by the JPSS Ground ERB on the effective date shown.	All

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Table of TBDs/TBRs

TBx	Type	ID	Text	Action
None				

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1 Introduction

1.1 Scope

The Joint Polar Satellite System (JPSS) Algorithm Specification for Ocean Color and Chlorophyll (OCC) - Volume II: Data Dictionary contains the specifications for the format of the Ocean Color and Chlorophyll 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.

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.

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
474-00448-01-24	JPSS Algorithm Specification Volume I: Software Requirements Specification (SRS) for the Ocean Color and Chlorophyll

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-S01-009	Joint Polar Satellite System (JPSS) VIIRS Ocean Color/Chlorophyll Algorithm Theoretical Basis Document (ATBD)
D0001-M01-S01-029	Joint Polar Satellite System (JPSS) VIIRS Atmospheric Correction Over Ocean Algorithm Theoretical Basis Document (ATBD)
474-00448-03-24	Joint Polar Satellite System (JPSS) Algorithm Specification Volume III: Operational Algorithm Description (OAD) for Ocean Color and Chlorophyll

Document Number	Title
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
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 (0 .. n-1). 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 CDFCB-X Vol. V - 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.

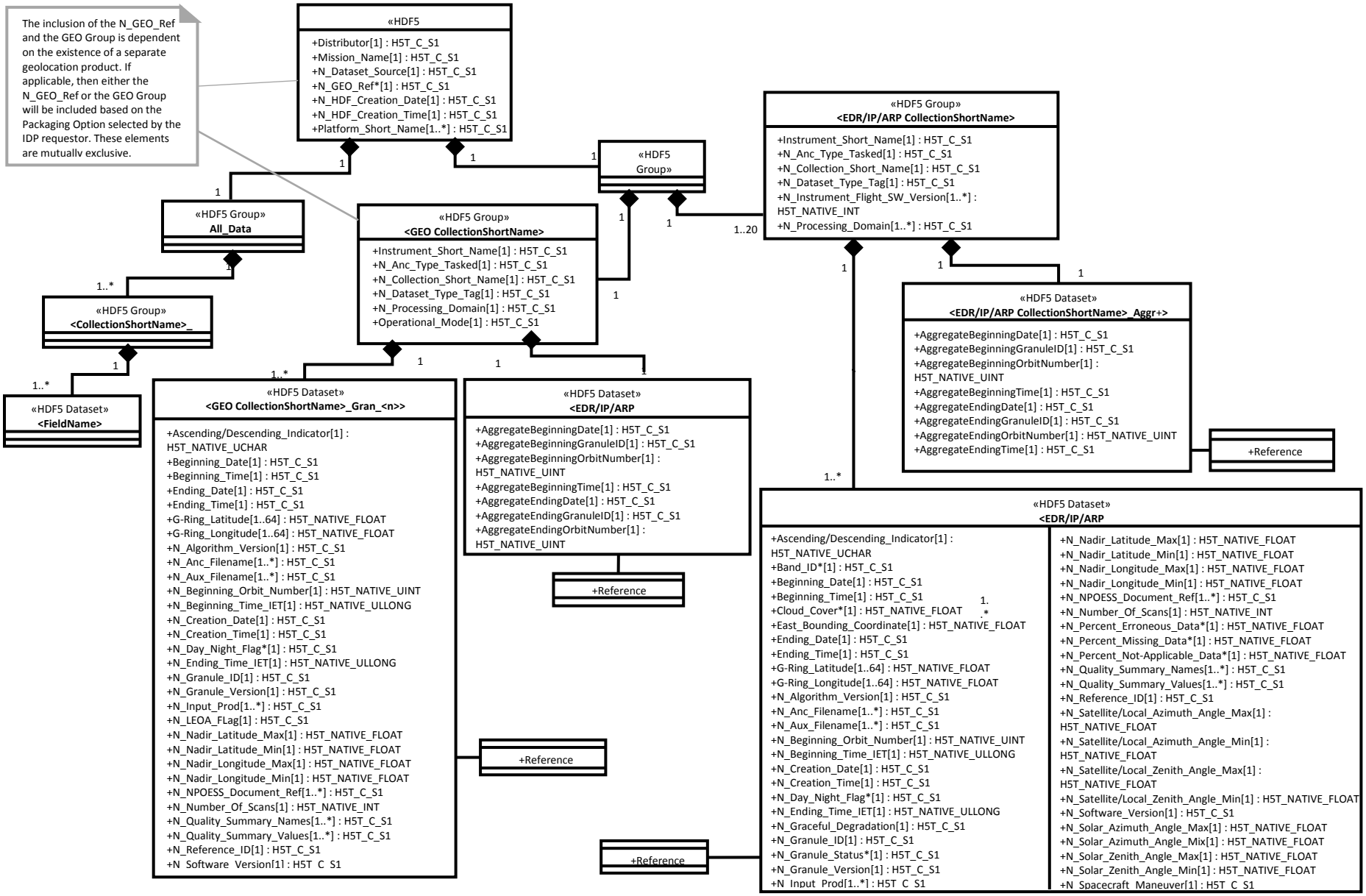

Figure: 3.1-1 Generalized UML Diagram for statically sized HDF5 IP/EDR Files

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.

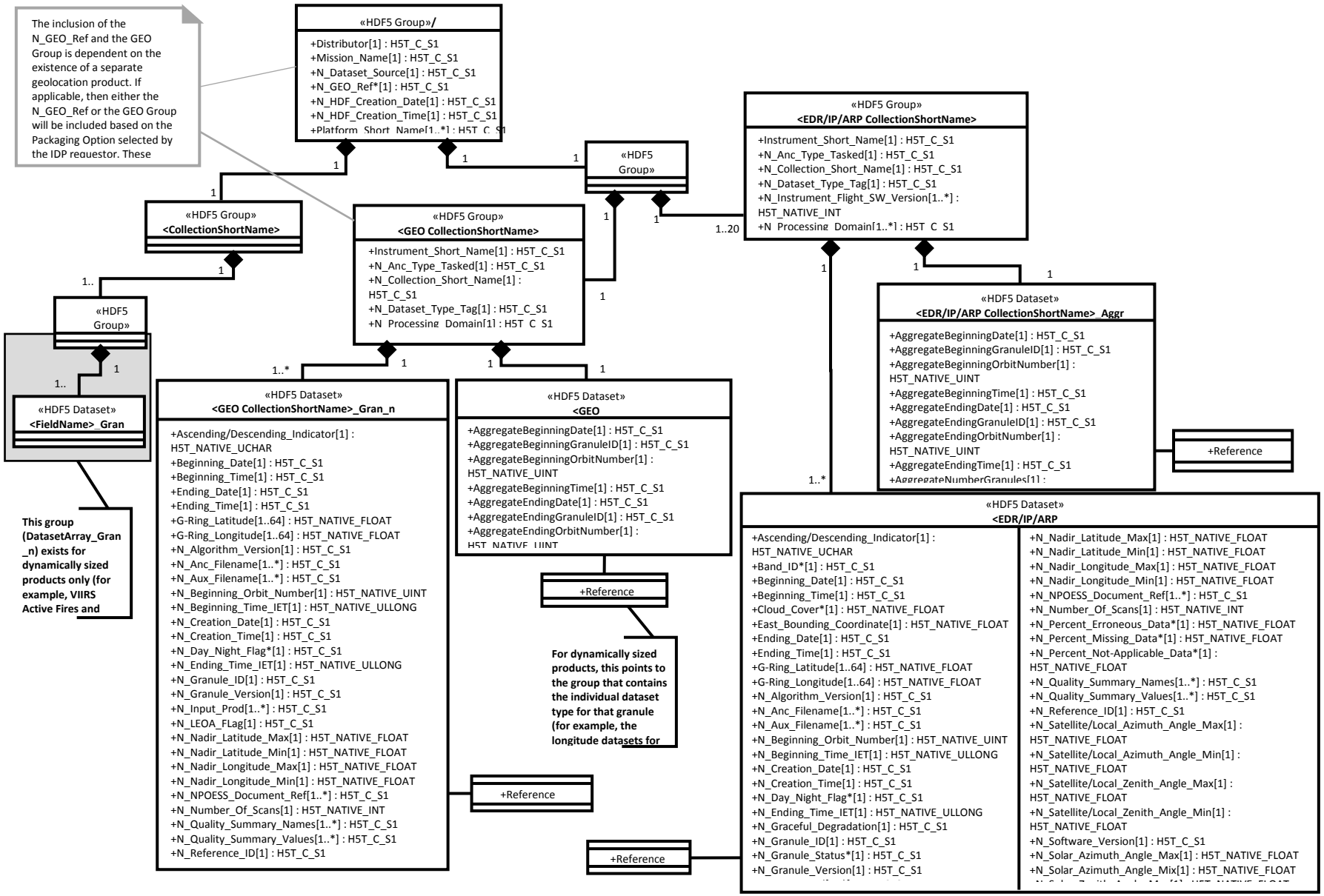

Figure: 3.2-1 Generalized UML Diagram for dynamically sized HDF5 IP/EDR Files

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)

Not Applicable

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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 Ocean Color Chlorophyll EDR

Data Mnemonic	EDRE-VROC-C0030 (Official) EDRE-VROC-C0031 (Substitute)
Description/ Purpose	Ocean color is defined as the spectrum of normalized water-leaving radiances (nL_W). All geophysical quantities of interest, e.g., the concentration of phytoplankton pigment chlorophyll-α and the inherent optical properties of absorption and backscattering of surface waters (ocean optical properties), are derived from these nLw values. Normalized water-leaving radiances are measured in $W*m^{-2}*sr^{-1}*micro\text{-}m^{-1}$ Ocean optical properties, absorption and backscattering, are estimated at each measured visible wavelength, and have units of m^{-1} while chlorophyll-a is measured in mg m^{-3}. The Ocean Color/Chlorophyll EDR is required under clear, daytime conditions only. “Clear” for this EDR is a cloud mask indicator of “confidently clear” for the horizontal cell of interest. Day condition for this EDR is when the solar zenith angle is less than or equal to 70 degrees and when the cloud mask does not indicate that the cell of interest is in a shadow. Sensors: VIIRS Effectivity: S-NPP and JPSS
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: 5.1.1-1 VIIRS Ocean Color Chlorophyll EDR Data Content Summary

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	This granule size includes OCC related fields only and is based on a VIIRS granule size consisting of 48 scans. 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 Ocean Color Chlorophyll EDR Data Content Summary See Section 5.1.2, VIIRS Ocean Color Chlorophyll EDR Product Profile See Section 5.1.3, VIIRS Ocean Color Chlorophyll EDR HDF5 Details See Section 5.1.4, VIIRS Ocean Color Chlorophyll EDR HDF5 Metadata Details See Section 5.1.5, VIIRS Ocean Color Chlorophyll EDR Geolocation Details

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5.1.1 VIIRS Ocean Color Chlorophyll EDR Data Content Summary

Table: 5.1.1-1 VIIRS Ocean Color Chlorophyll EDR Data Content Summary

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
Chlorophyll_a	Concentration of chlorophyll in a vertical column of the surface layer in the ocean	32-bit floating point	[N*768, 3200]	[768, 3200]	mg/m^3
IOP_a_412nm	Inherent Optical Properties - Absorption at 412nm	32-bit floating point	[N*768, 3200]	[768, 3200]	m^-1
IOP_a_445nm	Inherent Optical Properties - Absorption at 445nm	32-bit floating point	[N*768, 3200]	[768, 3200]	m^-1
IOP_a_488nm	Inherent Optical Properties - Absorption at 488nm	32-bit floating point	[N*768, 3200]	[768, 3200]	m^-1
IOP_a_555nm	Inherent Optical Properties - Absorption at 555nm	32-bit floating point	[N*768, 3200]	[768, 3200]	m^-1
IOP_a_672nm	Inherent Optical Properties - Absorption at 672nm	32-bit floating point	[N*768, 3200]	[768, 3200]	m^-1
IOP_s_412nm	Inherent Optical Properties - Backscattering at 412nm	32-bit floating point	[N*768, 3200]	[768, 3200]	m^-1
IOP_s_445nm	Inherent Optical Properties - Backscattering at 445nm	32-bit floating point	[N*768, 3200]	[768, 3200]	m^-1
IOP_s_488nm	Inherent Optical Properties - Backscattering at 488nm	32-bit floating point	[N*768, 3200]	[768, 3200]	m^-1
IOP_s_555nm	Inherent Optical Properties - Backscattering at 555nm	32-bit floating point	[N*768, 3200]	[768, 3200]	m^-1
IOP_s_672nm	Inherent Optical Properties - Backscattering at 672nm	32-bit floating point	[N*768, 3200]	[768, 3200]	m^-1
nLw_412nm	Normalized Water Leaving Radiance at 412nm	32-bit floating point	[N*768, 3200]	[768, 3200]	W/(m^2*sr*micro-m)
nLw_445nm	Normalized Water Leaving Radiance at 445nm	32-bit floating point	[N*768, 3200]	[768, 3200]	W/(m^2*sr*micro-m)
nLw_488nm	Normalized Water Leaving Radiance at 488nm	32-bit floating point	[N*768, 3200]	[768, 3200]	W/(m^2*sr*micro-m)
nLw_555nm	Normalized Water Leaving Radiance at 555nm	32-bit floating point	[N*768, 3200]	[768, 3200]	W/(m^2*sr*micro-m)

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
nLw_672nm	Normalized Water Leaving Radiance at 672nm	32-bit floating point	[N*768, 3200]	[768, 3200]	W/(m^2*sr*micro-m)
QF1_VIIRSOCCEDR	Pixel Level Quality Flags	unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF2_VIIRSOCCEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF3_VIIRSOCCEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF4_VIIRSOCCEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF5_VIIRSOCCEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF6_VIIRSOCCEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF7_VIIRSOCCEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
File Size	**174,489,600 Bytes**				

5.1.2 VIIRS Ocean Color Chlorophyll EDR Product Profile

Table: 5.1.2-1 VIIRS Ocean Color Chlorophyll EDR Product Profile

VIIRS Ocean Color Chlorophyll Product Profile

Fields

Name	Data Size	Dimensions
Chlorophyll_a	4byte(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	
								Name	Value	Name	Value
Concentration of chlorophyll in a vertical column of the surface layer in the ocean	0	0.05	50	mg/m^3	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		

													VDNE_FLOAT32_FILL	-999.3	

IOP_a_412nm 4byte(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	
								Name	Value	Name	Value
Inherent Optical Properties - Absorption at 412nm	0	0.01	10	m^-1	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		
								VDNE_FLOAT32_FILL	-999.3		

IOP_a_445nm 4byte(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	
								Name	Value	Name	Value
Inherent Optical Properties - Absorption at 445nm	0	0.01	10	m^-1	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		
								VDNE_FLOAT32_FILL	-999.3		

IOP_a_488nm 4byte(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	
								Name	Value	Name	Value
Inherent Optical Properties - Absorption at 488nm	0	0.01	10	m^-1	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		
								VDNE_FLOAT32_FILL	-999.3		

IOP_a_555nm 4byte(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	
								Name	Value	Name	Value
Inherent Optical Properties - Absorption at 555nm	0	0.01	10	m^-1	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		
								VDNE_FLOAT32_FILL	-999.3		

IOP_a_672nm 4byte(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	
								Name	Value	Name	Value
Inherent Optical Properties - Absorption at 672nm	0	0.01	10	m^-1	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		
								VDNE_FLOAT32_FILL	-999.3		

IOP_s_412nm 4byte(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	
								Name	Value	Name	Value
Inherent Optical Properties - Backscattering at 412nm	0	0.01	50	m^-1	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		
								VDNE_FLOAT32_FILL	-999.3		

IOP_s_445nm 4byte(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	
								Name	Value	Name	Value
Inherent Optical Properties - Backscattering at 445nm	0	0.01	50	m^-1	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		
								VDNE_FLOAT32_FILL	-999.3		

IOP_s_488nm 4byte(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	
								Name	Value	Name	Value
Inherent Optical Properties - Backscattering at 488nm	0	0.01	50	m^-1	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		
								VDNE_FLOAT32_FILL	-999.3		

IOP_s_555nm 4byte(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	
		Inherent Optical Properties - Backscattering at 555nm	0	0.01	50	m^-1	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		

IOP_s_672nm 4byte(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	
Inherent Optical Properties - Backscattering at 672nm	0	0.01	50	m^-1	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		

nLw_412nm 4byte(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	
Normalized Water Leaving Radiance at 412nm	0	0.1	40	W/(m^2*sr*micro-m)	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		

nLw_445nm 4byte(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	
Normalized Water Leaving Radiance at 445nm	0	0.1	40	W/(m^2*sr*micro-m)	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		

nLw_488nm 4byte(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	
Normalized Water Leaving Radiance at 488nm	0	0.1	40	W/(m^2*sr*micro-m)	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		

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											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

nLw_555nm — 4byte(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	
Normalized Water Leaving Radiance at 555nm	0	0.1	40	W/(m^2*sr*micro-m)	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		

nLw_672nm — 4byte(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	
Normalized Water Leaving Radiance at 672nm	0	0.1	40	W/(m^2*sr*micro-m)	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		

VIIRS Ocean Color Chlorophyll Product Profile - Quality Flags

Fields

Name	Data Size	Dimensions
QF1_VIIRSOCCEDR	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	
Indicates pixel level Normalized Water-Leaving Radiance quality at M1	0	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name	Value	Name	Value
										Good	0
										Poor	1
Indicates pixel level Normalized Water-Leaving Radiance quality at M2	1	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name	Value	Name	Value
										Good	0
										Poor	1
Indicates pixel level Normalized Water-Leaving Radiance quality at M3	2	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name	Value	Name	Value
										Good	0
										Poor	1
Indicates pixel level Normalized Water-Leaving Radiance quality at M4	3	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name	Value	Name	Value
										Good	0
										Poor	1

		Indicates pixel level Normalized Water-Leaving Radiance quality at M5	4	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value Good 0 Poor 1
		Indicates pixel level chlorophyll a concentration quality	5	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value Good 0 Poor 1
		Indicates pixel level IOP-a (Inherent Optical Properties-Absorption) quality at M1	6	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value Good 0 Poor 1
		Indicates pixel level IOP-s (Inherent Optical Properties-Scattering) quality at M1	7	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value Good 0 Poor 1
QF2_VIIRSOCCEDR	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
Indicates pixel level IOP-a (Inherent Optical Properties-Absorption) quality at M2	0	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value Good 0 Poor 1
Indicates pixel level IOP-s (Inherent Optical Properties-Scattering) quality at M2	1	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value Good 0 Poor 1
Indicates pixel level IOP-a (Inherent Optical Properties-Absorption) quality at M3	2	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value Good 0 Poor 1
Indicates pixel level IOP-s (Inherent Optical Properties-Scattering)quality at M3	3	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value Good 0 Poor 1
Indicates pixel level IOP-a (Inherent Optical Properties-Absorption) quality at M4	4	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value Good 0 Poor 1
Indicates pixel level IOP-s (Inherent Optical Properties-Scattering) quality at M4	5	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value Good 0 Poor 1
Indicates pixel level IOP-a (Inherent Optical Properties-Absorption) quality at M5	6	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value Good 0 Poor 1
Indicates pixel level IOP-s (Inherent Optical Properties-Scattering) quality at M5	7	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value Good 0 Poor 1

QF3_VIIRSOCCEDR 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
SDR quality for bands M1 to M7 (Any one band out of range is considered poor quality)	0	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value Good for all 7 bands 0 Poor (any band greater than thresholds) 1
Input Total Ozone Column Quality	1	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value Good 0

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											Poor	1
		Wind speed exceeds threshold of 8 m/s (Whitecap formation)	2	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name	Value
											False	0
											True	1
		Epsilon value is out of aerosol model range (eps <= 0.85 or eps >= 1.35)	3	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name	Value
											False	0
											True	1
		Atmospheric Correction Failure (Indicates at which correction step the algorithm first fails)	4	MIN_VAL	MAX_VAL	unitless	No		3 bit(s)	Name Value	Name	Value
											Correction successful	0
											Ozone failed	1
											Whitecap failed	2
											Polarization failed	3
											Rayleigh failed	4
											Aerosol failed	5
											Zero diffuse trans	6
											No Correction Possible	7
		Spare	7	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name	Value

QF4_VIIRSOCCEDR 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
Land/ Water Mask (Identifies the type of Earth surface that lies along the instruments line of sight - obtained from VIIRS Cloud Mask)	0	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	Name Value	Name Value
									Sea water 0
									Coastal water 1
									Inland water 2
									Land 3
Snow or Ice in Pixel (from the VIIRS Cloud Mask)	2	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value
									False 0
									True 1
Solar Zenith Angle=>70 deg (Day/Night Exclusion - Horizontal cell contains only nighttime. Solar Zenith Angle => 70 deg at center of horizontal cell)	3	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value
									False 0
									True 1
Sun Glint detected in pixel as indicated in the VIIRS Cloud Mask	4	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value
									False 0
									True 1
Exclusion - Horizontal Cell Size (HCS) > 1.3km (HCS > 1.3km, swath width > 1700 km or Sensor Zenith Angle > 53.0 degrees)	5	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value
									False 0
									True 1
Degradation - Horizontal cell contains shallow water; Depth < 50 meters	6	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value
									False 0
									True 1
Spare	7	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value

QF5_VIIRSOCCEDR 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 Confidence Indicator (Indicator of whether 'M' band pixel confidently clear, probably clear, probably cloudy or confidently cloudy, from VIIRS Cloud Mask)	0	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	Name Value	Name Value

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												Confidently clear: 0 Probably clear: 1 Probably cloudy: 2 Confidently cloudy: 3
		Adjacent Pixel is not confidently clear (as determined by the VIIRS Cloud Mask)	2	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)			False: 0 True: 1
		Thin Cirrus Cloud Detected in Pixel as determined by the VIIRS Cloud Mask	3	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)			False: 0 True: 1
		Exclusion: Cloud Shadow detected in Pixel (as determined by the VIIRS Cloud Mask	4	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)			False: 0 True: 1
		Non-Cloud Obstruction detected in Pixel (Heavy Aerosol) - as determined by the VIIRS Cloud Mask	5	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)			False: 0 True: 1
		Exclusion: Strongly absorbing aerosol detected in pixel (Single scattering albedo at M4 wavelength (555nm) <0.7)	6	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)			False: 0 True: 1
		Exclusion: AOT > 0.3 (AOT in horizontal cell > 0.3 on the slant path (AOT @865nm, M7))	7	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)			False: 0 True: 1

QF6_VIIRSOCCEDR 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
Exclusion: Turbid Water detected in Pixel (Remote Sensing Reflectance (M5) > 0.0012)	0	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)		False: 0 True: 1
Coccolithophores detected in Pixel : (nLw(M2)>=1.1 & nLw(M4)>=0.81 & Laer(M6)<= 1.1 & 0.6<=nLw(M2)/nLw(M4)<=1.1)	1	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)		False: 0 True: 1
Exclusion: Dissolved organic matter absorption at 410nm > 2/meter	2	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)		False: 0 True: 1
Range of Chlorophyll Concentration	3	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)		No Chlorophyll Retrieval: 0 Chlorophyll<1mg/m^3: 1 1.0<=Chlorophyll<10mg/m^3: 2 Chlorophyll>=10mg/m^3: 3
Carder Bio-Optics Algorithm Branching (The various branching and model mixing within the Carder bio-optics algorithm)	5	MIN_VAL	MAX_VAL	unitless	No		3 bit(s)		Initialized Value: 0 Carder empirical: 1 Unpackaged phytoplankton: 2 Weighted global-unpackaged: 3 Weighted packaged-global: 4 Weighted fully packaged-packaged: 5 Fully packaged phytoplankton: 6 No OCC Retrieval: 7

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.

QF7_VIIRSOCCEDR	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**			
		Ocean Color values (any band) out of range; 0= (1.0 <= nLw <= 40 W/m^2 micrometer sr); 1= out of range	0	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**		
												False	0		
												True	1		
		Chlorophyll-a values out of range (Chlorophyll-a < 0.05 or Chlorophyll-a > 50)	1	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**		
												False	0		
												True	1		
		IOP-a values (any band) out of range (IOP-a < 0.01 or IOP-a > 10.0)	2	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**		
												False	0		
												True	1		
		IOP-s values (any band) out of range (IOP-s < 0.01 or IOP-s > 50.0)	3	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**		
												False	0		
												True	1		
		Input Skin SST EDR Quality (Input Skin SST EDR Quality)	4	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**		
												Good	0		
												Poor	1		
		Exclusion - Bright Target Flag (The fraction of light into or out of cell exceeds threshold)	5	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**		
												Not Bright (bpflag <= 0.002)	0		
												Bright	1		
		Chlorophyll Algorithm Branching	6	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	**Name**	**Value**	**Name**	**Value**		
												Carder algorithm with Carder empirical	0		
												Carder algorithm with OC3V default	1		
												OC3V algorithm	2		
												No Retrieval	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.

5.1.3 VIIRS Ocean Color Chlorophyll EDR HDF5 Details

Figure 5.1.3-1 provides details on the contents and data types of the Ocean Color Chlorophyll EDR. This UML diagram provides detail 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-OCC-EDR
+Chlorophyll_a : H5T_NATIVE_FLOAT
+IOP_a_412nm : H5T_NATIVE_FLOAT
+IOP_a_445nm : H5T_NATIVE_FLOAT
+IOP_a_488nm : H5T_NATIVE_FLOAT
+IOP_a_555nm : H5T_NATIVE_FLOAT
+IOP_a_672nm : H5T_NATIVE_FLOAT
+IOP_s_412nm : H5T_NATIVE_FLOAT
+IOP_s_445nm : H5T_NATIVE_FLOAT
+IOP_s_488nm : H5T_NATIVE_FLOAT
+IOP_s_555nm : H5T_NATIVE_FLOAT
+IOP_s_672nm : H5T_NATIVE_FLOAT
+QF1_VIIRSOCCEDR : H5T_NATIVE_UCHAR
+QF2_VIIRSOCCEDR : H5T_NATIVE_UCHAR
+QF3_VIIRSOCCEDR : H5T_NATIVE_UCHAR
+QF4_VIIRSOCCEDR : H5T_NATIVE_UCHAR
+QF5_VIIRSOCCEDR : H5T_NATIVE_UCHAR
+QF6_VIIRSOCCEDR : H5T_NATIVE_UCHAR
+nLw_412nm : H5T_NATIVE_FLOAT
+nLw_445nm : H5T_NATIVE_FLOAT
+nLw_488nm : H5T_NATIVE_FLOAT
+nLw_555nm : H5T_NATIVE_FLOAT
+nLw_672nm : H5T_NATIVE_FLOAT

Figure: 5.1.3-1 VIIRS Ocean Color Chlorophyll HDF5 UML Diagram

5.1.4 VIIRS Ocean Color Chlorophyll EDR HDF5 Metadata Details

The HDF5 metadata elements associated with the Ocean Color Chlorophyll EDR are listed in the JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms, 474-00448-02-01. The Ocean Color Chlorophyll EDR metadata includes all common metadata at the root, product, aggregation, and granule level. In addition to the common metadata items for this product, Table 5.1.4-1, VIIRS Ocean Color Chlorophyll 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 Ocean Color Chlorophyll EDRs.

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: 5.1.4-1 VIIRS Ocean Color Chlorophyll Quality Summary Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Comments**
Exclusion - No Ocean Present	0 or 1	Granule contains no ocean coverage	0 = Ocean present 1 = No ocean present
Exclusion Summary	0 - 100	Percent of pixels in one or more exclusion conditions	
Overall Chlorophyll a Concentration Quality	0 - 100	Percent of high quality Chlorophyll a Concentration retrievals within the granule	
Overall IOP-a Quality at M1 (412nm)	0 - 100	Percent of high quality IOP-a (Inherent Optical Properties - Absorption) retrievals at M1 (412nm) within the granule	
Overall IOP-a Quality at M2 (445nm)	0 - 100	Percent of high quality IOP-a (Inherent Optical Properties - Absorption) retrievals at M2 (445nm) within the granule	
Overall IOP-a Quality at M3 (488nm)	0 - 100	Percent of high quality IOP-a (Inherent Optical Properties - Absorption) retrievals at M3 (488nm) within the granule	
Overall IOP-a Quality at M4 (555nm)	0 - 100	Percent of high quality IOP-a (Inherent Optical Properties - Absorption) retrievals at M4 (555nm) within the granule	
Overall IOP-a Quality at M5 (672nm)	0 - 100	Percent of high quality IOP-a (Inherent Optical Properties - Absorption) retrievals at M5 (672nm) within the granule	
Overall IOP-s Quality at M1 (412nm)	0 - 100	Percent of high quality IOP-s (Inherent Optical Properties - Backscattering) retrievals at M1 (412nm) within the granule	
Overall IOP-s Quality at M2 (445nm)	0 - 100	Percent of high quality IOP-s (Inherent Optical Properties - Backscattering) retrievals at M2 (445nm) within the granule	
Overall IOP-s Quality at M3 (488nm)	0 - 100	Percent of high quality IOP-s (Inherent Optical Properties - Backscattering retrievals at M3 (488nm) within the granule	
Overall IOP-s Quality at M4 (555nm)	0 - 100	Percent of high quality IOP-s (Inherent Optical Properties - Backscattering) retrievals at M4 (555nm) within the granule	

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			
Overall IOP-s Quality at M5 (672nm)	0 - 100	Percent of high quality IOP-s (Inherent Optical Properties - Backscattering) retrievals at M5 (672nm) within the granule	
Overall Ocean Color Quality for M1 (412nm)	0 - 100	Percentage of high quality Ocean Color retrievals at M1 (412nm) within the granule	
Overall Ocean Color Quality for M2 (445nm)	0 - 100	Percentage of high quality Ocean Color retrievals at M2(445nm) within the granule	
Overall Ocean Color Quality for M3 (488nm)	0 - 100	Percentage of high quality Ocean Color retrievals at M3 (488nm) within the granule	
Overall Ocean Color Quality for M4 (555nm)	0 - 100	Percentage of high quality Ocean Color retrievals at M4 (555nm) within the granule	
Overall Ocean Color Quality for M5 (672nm)	0 - 100	Percentage of high quality Ocean Color retrievals at M5 (672nm) within the granule	
Summary Chlorophyll Concentration Range Check	0 - 100	Percent of Chlorophyll retrievals that are out of expected range	
Summary IOP-a Range Check	0 - 100	Percent of IOP-a (Inherent Optical Properties-Absorption) retrievals (all bands) that are out of expected range	
Summary IOP-s Range Check	0 - 100	Percent of IOP-s (Inherent Optical Properties-Backscattering) retrievals (all bands) that are out of expected range	
Summary Ocean Color Range Check	0 - 100	Percent of Ocean Color Retrievals (all bands) that are out of expected range	

5.1.5 VIIRS Ocean Color Chlorophyll EDR Geolocation Details

The VIIRS Ocean Color Chlorophyll EDR is produced on the VIIRS Moderate Resolution Geolocation - Terrain Corrected. See the JPSS Algorithm Specification Volume II: Data Dictionary for the VIIRS RDR/SDR Section 6.2, 474-00448-02-06, VIIRS Moderate Resolution Geolocation - Terrain Corrected for 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

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.

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 Ocean Color Chlorophyll LUT

7.1.1.1 VIIRS ACO/OCC Detector-Dependent Rayleigh Correction Adjustment LUT

Data Mnemonic	NP_NU-LM0234-003
Description/ Purpose	VIIRS Ocean Color/Chlorophyll Detector-Dependent Rayleigh Correction Adjustment LUT.

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.

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.
File Size	See Table: 7.1.1.1-1 VIIRS Detector-Dependent Rayleigh Correction Adjustment LUT Data Format
File Format Type	Little Endian Binary
Production Frequency	As needed
Data Content and Data Format	For details see Table 7.1.1.1-1, VIIRS Detector-Dependent Rayleigh Correction Adjustment LUT Data Format.

Table: 7.1.1.1-1 VIIRS Detector-Dependent Rayleigh Correction Adjustment LUT Data Format

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
ray_detcor	448	32-bit floating point	0.993 <= ray_detcor <= 1.006	unitless	Detector-Dependent Rayleigh Correction Adjustment Factors for detectors 1-16 of bands M1-M7 2 Dimensional Array: ndet x acobands Size of Dimension(s): 7 x 16
File Size	**448 Bytes**				

7.1.1.2 VIIRS ACO/OCC Aerosol Coefficients LUT

Data Mnemonic	NP_NU-LM0040-010
Description/ Purpose	The VIIRS ACO/OCC Aerosol Coefficients LUT file contains parameters used to compute the aerosol contribution to the TOA reflectance. This file is used in the VIIRS ACO/OCC 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: 7.1.1.2-1 VIIRS ACO/OCC Aerosol Coefficients LUT Data Format
File Format Type	Little Endian Binary
Production Frequency	As needed
Data Content and Data Format	For details see Table 7.1.1.2-1, VIIRS ACO/OCC Aerosol Coefficients 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: 7.1.1.2-1 VIIRS ACO/OCC Aerosol Coefficients LUT Data Format

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
cost	36867600	32-bit floating point	~-0.05 <= acost <= ~27.0 ~-0.7 <= bcost <= ~4.0 ~-219<= ccost <= ~136.0 ~-5254 <= dcost <= ~10,247 ~-144187 <= ecost <= ~64163	unitless	1) Coefficients for fit as rho_a + rho_ra vs. rho_as for the VIIRS bands, or 2) Coefficients for fit rho_as vs. (rho_a + rho_ra) for the VIIRS NIR bands. Coefficients are used to compute the multi-scattering aerosol reflectance for bands M1-M5. Note: AERO_COEF dimension (size = 5) corresponds to a,b,c,d,e (i.e. acost) 6 Dimensional Array: MODEL x ACOBANDS x MSUN x MPHI x NRAD x AERO_COEF Size of Dimension(s): 12 x 7 x 33 x 19 x 35 x 5
cost_rev	36867600	32-bit floating point	~-5996 <= acost_rev <= ~6167 ~-7972 <= bcost_rev <= ~3423 ~-1937 <= ccost-rev <= ~3664 ~-3160 <= dcost_rev <= ~2539 ~-34950 <= ecost_rev <=~33761	unitless	1) Coefficients for fit as rho_a + rho_ra vs. rho_as for the VIIRS bands, or 2) Coefficients for fit rho_as vs. (rho_a + rho_ra) for the VIIRS NIR bands. Single-scattering aerosol (M6 - M7) reflectance coefficients are stored in these arrays (acost_rev, …).

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
					Note: AERO_COEF dimension (size = 5) corresponds to a,b,c,d,e (i.e. acost_rev) 6 Dimensional Array: MODEL x ACOBANDS x MSUN x MPHI x NRAD x AERO_COEF Size of Dimension(s): 12 x 7 x 33 x 19 x 35 x 5
thetav	140	32-bit floating point	1 <= thetav <= 75	degrees	Sensor zenith angles 1 Dimensional Array: NRAD Size of Dimension(s): 35
File Size	**73,735,340 Bytes**				

7.1.1.3 VIIRS ACO/OCC Aerosol Properties

Data Mnemonic	NP_NU-LM0040-011
Description/ Purpose	The VIIRS ACO/OCC Aerosol Properties LUT file contains aerosol parameters pertaining to 12 different aerosol models. This file is used in the VIIRS ACO/OCC 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: 7.1.1.3-1 VIIRS ACO/OCC Aerosol Properties LUT Data Format
File Format Type	Little Endian Binary
Production Frequency	As needed
Data Content and Data Format	For details see Table 7.1.1.3-1, VIIRS ACO/OCC Aerosol Properties 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: 7.1.1.3-1 VIIRS ACO/OCC Aerosol Properties LUT Data Format

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
angle	300	32-bit floating point	0 <= angle <= 180 (increments vary)	degrees	Scattering angles 1 Dimensional Array: NUM_SCAT_ANGLES Size of Dimension(s): 75
wavelength	28	32-bit integer	[412,443,448, 555,670,748, 865]	nm	VIIRS band center wavelengths 1 Dimensional Array: ACOBANDS Size of Dimension(s): 7
omega0	336	32-bit floating point	0.9295 <= omega0 <= 1.0	unitless	Aerosol Single Scattering Albedo 2 Dimensional Array: MODEL x ACOBANDS Size of Dimension(s): 12 x 7
extinc	336	32-bit floating point	1.8376×10^{-5} <= extinct <= 0.0885	unitless	Aerosol extinction coefficient 2 Dimensional Array: MODEL x ACOBANDS Size of Dimension(s): 12 x 7
s11	25200	32-bit floating point	0.0350 <= s11 <= 9.4143×10^{3}	unitless	Aerosol Scattering Phase Function 3 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
					MODEL x ACOBANDS x NUM_SCAT_ANGLES Size of Dimension(s): 12 x 7 x 75
ylog	25200	32-bit floating point	Dependent on the original y values	unitless	Logs of s11 (scattering phase function) 3 Dimensional Array: MODEL x ACOBANDS x NUM_SCAT_ANGLES Size of Dimension(s): 12 x 7 x 75
y2	25200	32-bit floating point	Dependent on the original y values	unitless	Spline (second derivative) of s11 (scattering phase function) 3 Dimensional Array: MODEL x ACOBANDS x NUM_SCAT_ANGLES Size of Dimension(s): 12 x 7 x 75
File Size	**76,600 Bytes**				

7.1.1.4 VIIRS ACO/OCC Diffuse Transmittance LUT

Data Mnemonic	NP_NU-LM0040-012
Description/ Purpose	The VIIRS ACO/OCC Diffuse Transmittance LUT file contains values of fitting coefficients used to compute the diffuse transmittance. This file is used in the VIIRS ACO/OCC 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: 7.1.1.4-1 VIIRS ACO/OCC Diffuse Transmittance LUT Data Format
File Format Type	Little Endian Binary
Production Frequency	As needed
Data Content and Data Format	For details see Table 7.1.1.4-1, VIIRS ACO/OCC Diffuse Transmittance 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: 7.1.1.4-1 VIIRS ACO/OCC Diffuse Transmittance LUT Data Format

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
tt_coef_a	11088	32-bit floating point	0 <= tt_coeff_a <= ~1.0	unitless	Diffuse Transmittance Coefficient 3 Dimensional Array: MSUN x ACOBANDS x MODEL Size of Dimension(s): 33 x 7 x 12
tt_coef_b	11088	32-bit floating point	0 <= tt_coeff_b <= ~0.33	unitless	Diffuse Transmittance Coefficient 3 Dimensional Array: MSUN x ACOBANDS x MODEL Size of Dimension(s): 33 x 7 x 12
File Size	**22,176 Bytes**				

7.1.1.5 VIIRS ACO/OCC Rayleigh Scattering LUT

Data Mnemonic	NP_NU-LM0040-013
Description/ Purpose	The VIIRS ACO/OCC Rayleigh Scattering LUT file contains values used to compute the Rayleigh Component of the TOA reflectance. This file is used in the VIIRS ACO/OCC (ACO module) 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: 7.1.1.5-1 VIIRS ACO/OCC Rayleigh Scattering LUT Data Format
File Format Type	Little Endian Binary
Production Frequency	As needed
Data Content and Data Format	For details see Table 7.1.1.5-1, VIIRS ACO/OCC Rayleigh Scattering 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: 7.1.1.5-1 VIIRS ACO/OCC Rayleigh Scattering LUT Data Format

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
ray_tau	28	32-bit floating point	0.0159 (M7) <= ray_tau <= 0.3164(M1)	unitless	Rayleigh Optical Thickness values for bands M1-M7 1 Dimensional Array: ACOBANDS Size of Dimension(s): 7
sigma_g	32	32-bit floating point	0.0 <= sigma_g <= 0.4	unitless	Surface Roughness Parameter (Not used in the code) 1 Dimensional Array: NSIGMA Size of Dimension(s): 8
ray_dep	28	32-bit floating point	0.0273 <= ray_dep <= 0.0296	unitless	Depolarization Factor for bands M1-M7 1 Dimensional Array: ACOBANDS Size of Dimension(s): 7
ray_sun	180	32-bit floating point	0.0 <= ray_sun <= 88.0 (2 degree intervals)	degrees	Solar Zenith Angles 1 Dimensional Array: NSUN Size of Dimension(s): 45
ray_ang	164	32-bit floating point	0.0 <= ray_ang <= 84.2153 (~ 2 degree intervals)	degrees	Sensor Zenith Angles 1 Dimensional Array: NRAD_RAY Size of Dimension(s): 41
ray_for_i	1239840	32-bit floating point	~-0.013 <= ray_for_i <= ~ 0.107	unitless	I Stokes Parameter 5 Dimensional Array: ACOBANDS x NSIGMA x NSUN x NORDER x NRAD_RAY Size of Dimension(s): 7 x 8 x 45 x 3 x 41

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
ray_for_q	1239840	32-bit floating point	~-0.066 <= ray_for_q <= ~ 0.027	unitless	Q Stokes Parameter 5 Dimensional Array: ACOBANDS x NSIGMA x NSUN x NORDER x NRAD_RAY Size of Dimension(s): 7 x 8x 45 x 3 x 41
ray_for_u	1239840	32-bit floating point	0.0 <= ray_for_u <= ~0.064	unitless	U Stokes Parameter 5 Dimensional Array: ACOBANDS x NSIGMA x NSUN x NORDER x NRAD_RAY Size of Dimension(s): 7 x 8 x 45 x 3 x 41
File Size	**3,719,952 Bytes**				

7.1.1.6 VIIRS ACO/OCC Instrumental Polarization Sensitivity LUT

Data Mnemonic	NP_NU-LM0234-002
Description/ Purpose	The VIIRS ACO/OCC Instrumental Polarization Sensitivity LUT are instrument configuration settings used as corrections in the VIIRS OCC EDR.
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.
File Size	See Table: 7.1.1.6-1 VIIRS ACO/OCC Instrument Polarization Sensitivity LUT Data Format
File Format Type	Little Endian Binary
Production Frequency	As needed
Data Content and Data Format	For details see Table 7.1.1.6-1, VIIRS ACO/OCC Instrument Polarization Sensitivity 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: 7.1.1.6-1 VIIRS ACO/OCC Instrument Polarization Sensitivity LUT Data Format

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
polcor_coef_a	2688	32-bit floating point	-0.1 <= polcor_coef_a <= 0.1	unitless	Polarization Correction Coefficient 4 Dimensional Array: nCoef x nDetector x nHAM x acobands Size of Dimension(s): 3 x 16 x 2 x 7
polcor_coef_b	2688	32-bit floating point	-0.1 <= polcor_coef_b <= 0.1	unitless	Polarization Correction Coefficient 4 Dimensional Array: nCoef x nDetector x nHAM x acobands Size of Dimension(s): 3 x 16 x 2 x 7
File Size	**5,376 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 VIIRS Ocean Color Chlorophyll Automated PCs

VIIRS Ocean Color Chlorophyll product generation 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 Ocean Color Chlorophyll Initialization PCs

VIIRS Ocean Color Chlorophyll product generation currently uses no Initialization PCs.

7.2.2.2 VIIRS ACO/Ocean Color Chlorophyll Ephemeral PCT

Data Mnemonic	DP_NU-LM2020-025
Description/ Purpose	The VIIRS ACO/OCC 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 ACO/OCC Ephemeral PC
File Format Type	Little Endian Binary
Production Frequency	As needed

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	For details see Table 7.2.2.2-1, VIIRS ACO/OCC Ephemeral PC Data Format

Table: 7.2.2.2-1 VIIRS ACO/OCC Ephemeral PC

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
esol	40	64-bit floating point	Initially set to [1708.78748, 1862.79031, 1999.75896, 1869.62187, 1530.19582]	unitless	Coefficient to convert the RSR (remote sensing reflectance) to water leaving radiance 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5
band1	4	32-bit integer	Initially set to 1	unitless	M1 (412nm)
band2	4	32-bit integer	Initially set to 2	unitless	M2 (445nm)
band3	4	32-bit integer	Initially set to 3	unitless	M3 (488nm)
band4	4	32-bit integer	Initially set to 4	unitless	M4 (555nm)
Iam	20	32-bit integer	Initially set to [412, 443, 490, 555, 670]	nm	Wavelengths used in algorithm 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5
bb_denom	4	32-bit integer	Initially set to 0	unitless	For bb_denom = 0: backscatter coefficients are added to absorption coeffs to obtain 675nm abs coeff. For bb_demon = 1: Only absorption coeffs are used
chl_key	4	32-bit integer	Initially set to 2	unitless	Chlorophyll algorithm selection enumeration (0 = Carder (Initial Value), 1 = Carder with OC3V, or 2 = OC3V)
d1	4	32-bit floating point	Initially set to 2.5	unitless	Threshold for determining 'packaged' vs 'unpackaged' bio-optical domains using the r12 vs r25 comparison
d2	4	32-bit floating point	Initially set to 0.95	unitless	Regression line Coefficient for r12 vs r25 comparison
d3	4	32-bit floating point	Initially set to 0.16	unitless	Regression line Coefficient (exponent) for r12 vs r25 comparison
delta	4	32-bit floating point	Initially set to 0.03	unitless	Difference used in determination phytoplankton packaging type
s	4	32-bit floating point	Initially set to 0.0225	nm^-1	Empirically determined coefficient used in calculation of absorption due to detritus and gelbstoff (CDOM)

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
bbw	20	32-bit floating point	Initially set to [0.003341, 0.002406, 0.001563, 0.000929, 0.000388]	m^-1	Backscatter coefficients for water for the 5 wavelengths specified in the ’lam‘ field. 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5
aw	20	32-bit floating point	Initially set to [0.0048, 0.00742, 0.01632, 0.0591, 0.43538]	m^-1	Absorption coefficients for water for the 5 wavelengths specified in the ’lam‘ field. 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5
ga0	20	32-bit floating point	Initially set to [1.82, 3.05, 1.94, 0.39, 1.0]	unitless	Global a0 coefficients for total absorption (hyperbolic tangent function) for the 5 wavelengths specified in the 'lam' field. 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5
ga1	20	32-bit floating point	Initially set to [0.59, 0.69, 0.54, -0.18, 0.0]	unitless	Global a1 coefficients for total absorption (hyperbolic tangent function) for the 5 wavelengths specified in the ’lam‘ field. 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5
ga2	20	32-bit floating point	Initially set to [-0.48, -0.48, -0.48, -0.48, -0.48]	unitless	Global a2 coefficients for total absorption (hyperbolic tangent function) for the 5 wavelengths specified in the ’lam‘ field. 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5
ga3	20	32-bit floating point	Initially set to [0.014, 0.014, 0.014, 0.014, 0.014]	m^-1	Global a3 coefficients for total absorption (hyperbolic tangent function) for the 5 wavelengths specified in the ’lam‘ field.

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Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
					1 Dimensional Array: OCCBANDS Size of Dimension(s): 5
x0	4	32-bit floating point	Initially set to -0.00182	m^-1	Empirical coefficient (MODIS derived) used to derive magnitude of particle backscattering (X)
x1	4	32-bit floating point	Initially set to 2.058	sr m^-1	Empirical coefficient (MODIS derived) used to derive magnitude of particle backscattering (X)
y_0	4	32-bit floating point	Initially set to -1.13	m^-1	Empirical coefficient (MODIS derived) used to derive Spectral Shape particle backscattering (Y)
y_1	4	32-bit floating point	Initially set to 2.57	m^-1	Empirical coefficient (MODIS derived) used to derive Spectral Shape particle backscattering (Y)
aph_lo	4	32-bit floating point	Initially set to 9.9999997e-05	m^-1	Min value used to obtain the root (bisection method) for the 675nm absorption coefficient
aph_hi	4	32-bit floating point	Initially set to 0.03	m^-1	Max value used to obtain the root (bisection method) for the 675nm absorption coefficient
gc0	4	32-bit floating point	Initially set to 0.354824	log10(mg/m^3)	Model Dependent Coefficients for Chlorophyll-a Concentration calculations (these values are used to calculate log10(chl a))
gc1	4	32-bit floating point	Initially set to -2.64124	log10(mg/m^3)	
gc2	4	32-bit floating point	Initially set to 1.13884	log10(mg/m^3)	
gc3	4	32-bit floating point	Initially set to -1.62316	log10(mg/m^3)	
gp0	4	32-bit floating point	Initially set to 1.7454	log10(mg/m^3)	Empirical (default) Dependent Coefficients for Chlorophyll-a Concentration calculations (these values are used to calculate log10(chl a))
gp1	4	32-bit floating point	Initially set to 1.0	log10(mg/m^3)	
gp2	4	32-bit floating point	Initially set to 0.0	log10(mg/m^3)	

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Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
low_412_thresh	4	32-bit floating point	Initially set to 0.0008	unitless	
low_555_thresh	4	32-bit floating point	Initially set to 0.001	unitless	
chl_inconsistent_thresh	4	32-bit floating point	Initially set to 0.4	unitless	Threshold used to check the value of the calculated modeled Chlorophyll a output
upa0	20	32-bit floating point	Initially set to [2.2, 3.59, 2.27, 0.42, 1.0]	unitless	Unpackaged a0 coefficients for total absorption (hyperbolic tangent function) for the 5 wavelengths specified in the ’lam‘ field 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5
upa3	20	32-bit floating point	Initially set to [0.0112, 0.0112, 0.0112, 0.0112, 0.0112]	m^-1	Unpackaged a3 coefficients for total absorption (hyperbolic tangent function) for the 5 wavelengths specified in the ’lam‘ field 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5
pa0	20	32-bit floating point	Initially set to [1.46778, 2.53786, 1.62954, 0.35552, 1.0]	unitless	Packaged a0 coefficients for total absorption (hyperbolic tangent function) for the 5 wavelengths specified in the ’lam‘ field 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5
pa3	20	32-bit floating point	Initially set to [0.017276, 0.017276, 0.017276, 0.017276, 0.017276]	m^-1	Packaged a3 coefficients for total absorption (hyperbolic tangent function) for the 5 wavelengths specified in the ’lam‘ field 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5

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
upc0	4	32-bit floating point	Initially set to 0.2818	log10(mg/m^3)	Unpackaged c0 empirical coefficient for calculation of log10(chl a)
upc1	4	32-bit floating point	Initially set to -2.783	log10(mg/m^3)	Unpackaged c1 empirical coefficient for calculation of log10(chl a)
upc2	4	32-bit floating point	Initially set to 1.863	log10(mg/m^3)	Unpackaged c2 empirical coefficient for calculation of log10(chl a)
upc3	4	32-bit floating point	Initially set to -2.387	log10(mg/m^3)	Unpackaged c3 empirical coefficient for calculation of log10(chl a)
pc0	4	32-bit floating point	Initially set to 0.423284	log10(mg/m^3)	Packaged c0 empirical coefficient for calculation of log10(chl a)
pc1	4	32-bit floating point	Initially set to -2.50834	log10(mg/m^3)	Packaged c1 empirical coefficient for calculation of log10(chl a)
pc2	4	32-bit floating point	Initially set to 0.45994	log10(mg/m^3)	Packaged c2 empirical coefficient for calculation of log10(chl a)
pc3	4	32-bit floating point	Initially set to -0.90706	log10(mg/m^3)	Packaged c3 empirical coefficient for calculation of log10(chl a)
upp0	4	32-bit floating point	Initially set to 1.715	log10(mg/m^3)	Unpackaged p0 modeled coefficient for calculation of log10(chl a)
upp1	4	32-bit floating point	Initially set to 1.0	log10(mg/m^3)	Unpackaged p1 modeled coefficient for calculation of log10(chl a)
upp2	4	32-bit floating point	Initially set to 0.0	log10(mg/m^3)	Unpackaged p2 modeled coefficient for calculation of log10(chl a)
pp0	4	32-bit floating point	Initially set to 1.7739	log10(mg/m^3)	Packaged p0 modeled coefficient for calculation of log10(chl a)
pp1	4	32-bit floating point	Initially set to 1.0	log10(mg/m^3)	Packaged p1 modeled coefficient for calculation of log10(chl a)
pp2	4	32-bit floating point	Initially set to 0.0	log10(mg/m^3)	Packaged p2 modeled coefficient for calculation of log10(chl a)
hpa0	20	32-bit floating point	Initially set to [1.019, 1.893, 1.237, 0.316, 1.0]	unitless	Fully Packaged a0 modeled coefficients for for Phytoplankton Absorption Function aph 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
hpa1	20	32-bit floating point	Initially set to [0.26, 0.45, 0.42, -0.08, 0.0]	unitless	Fully Packaged a1 modeled coefficients for for Phytoplankton Absorption Function aph 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5
hpa2	20	32-bit floating point	Initially set to [-0.45, -0.45, -0.45, -0.45, -0.45]	unitless	Fully Packaged a2 modeled coefficients for for Phytoplankton Absorption Function aph 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5
hpa3	20	32-bit floating point	Initially set to [0.021, 0.021, 0.021, 0.021, 0.021]	m^-1	Fully Packaged a3 modeled coefficients for for Phytoplankton Absorption Function aph 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5
hpc0	4	32-bit floating point	Initially set to 0.51	log10(mg/m^3)	Fully Packaged c0 empirical coefficient for calculation of log10(chl a)
hpc1	4	32-bit floating point	Initially set to -2.34	log10(mg/m^3)	Fully Packaged c1 empirical coefficient for calculation of log10(chl a)
hpc2	4	32-bit floating point	Initially set to 0.4	log10(mg/m^3)	Fully Packaged c2 empirical coefficient for calculation of log10(chl a)
hpc3	4	32-bit floating point	Initially set to 0.0	log10(mg/m^3)	Fully Packaged c3 empirical coefficient for calculation of log10(chl a)
hpp0	4	32-bit floating point	Initially set to 1.9	log10(mg/m^3)	Fully Packaged p0 modeled coefficient for calculation of log10(chl a)
hpp1	4	32-bit floating point	Initially set to 1.0	log10(mg/m^3)	Fully Packaged p1 modeled coefficient for calculation of log10(chl a)
hpp2	4	32-bit floating point	Initially set to 0.0	log10(mg/m^3)	Fully Packaged p2 modeled coefficient for calculation of log10(chl a)

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Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
lambda0bb	4	32-bit floating point	Initially set to 555	nm	Reference wavelength for backscattering (related to absorption coefficient due to phytoplankton)
lambda0dom	4	32-bit floating point	Initially set to 400	nm	Reference wavelength for backscattering (related to absorption coefficient due to gelbstoff/DOM)
bathy_thresh	4	32-bit floating point	Initially set to -50.0	meter	Bathymetry threshold for identification of shallow water conditions
rsr_thresh	4	32-bit floating point	Initially set to 0.32	sr^-1	Remote sensing reflectance threshold used to indicate no retrieval
rsr_min	4	32-bit floating point	Initially set to 9.9999999e-09	sr^-1	Remote sensing reflectance minimum used to indicate out of bounds
turbid_water_thresh	4	32-bit floating point	Initially set to 0.0012	sr^-1	Turbid water threshold (M5 RSR value) used to set exclusion condition
Max_nLw	4	32-bit floating point	Initially set to 40.0	W/(m^2 um sr)	Max nLw value used to set Poor quality/Out of range flag
Min_nLw	4	32-bit floating point	Initially set to 0.1	W/(m^2 um sr)	Min nLw value used to set Poor quality/out of range flag
Max_chlo	4	32-bit floating point	Initially set to 50	mg/m^3	Max Chlorophyll a value used to set Poor quality/Out of range flag
Min_chlo	4	32-bit floating point	Initially set to 0.05	mg/m^3	Min Chlorophyll a value used to set Poor quality/out of range flag
Chlo_1	4	32-bit floating point	Initially set to 1.0	mg/m^3	Chlorophyll a values used to set the 'Range of Chlorophyll Concentration' flag*
Chlo_10	4	32-bit floating point	Initially set to 10.0	mg/m^3	
Max_iopa	4	32-bit floating point	Initially set to 10.0	m^-1	IOP-a/IOP-s values used to set the quality flags
Max_iops	4	32-bit floating point	Initially set to 50.0	m^-1	
Min_iopa	4	32-bit floating point	Initially set to 0.01	m^-1	
Min_iops	4	32-bit floating point	Initially set to 0.01	m^-1	
NLW_M2_THRESH	4	32-bit floating point	Initially set to 1.1	W/(m^2 (mu)m sr)	nLw values used to set good/poor quality flag for each (M1-M5) band
NLW_M4_THRESH	4	32-bit floating point	Initially set to 0.81	W/(m^2 (mu)m sr)	
M2_M4_RATIO_MIN	4	32-bit floating point	Initially set to 0.6	unitless	

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Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
M2_M4_RATIO_MAX	4	32-bit floating point	Initially set to 1.1	unitless	
aa	20	32-bit floating point	Initially set to [2.71247525669551, -4.93449420258074, 3.41474858799965, -3.02114778759546, 0.36980217074978]	unitless	Regression coefficients for OC3V (based on VIIRS/SeaWifs Jeremy Werdell (NASA) values. 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5
sphae	4	32-bit floating point	Initially set to 0.0225	nm^-1	phaeophytin term for total absorption coeff calculation
lam412	4	32-bit floating point	Initially set to 412	unitless	phaeophytin term for ag412 used in the total absorption coeff calculation
ag_def_coeff	20	32-bit floating point	Initially set to [-1.147, -1.963, -1.01, 0.856, 1.702]	unitless	ag coeff values for OCC band 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5
aph_def_coeff	20	32-bit floating point	Initially set to [-0.919, 1.037, -0.407, -3.531, 1.579]	unitless	Aph coeff values for OCC bands 1 Dimensional Array: OCCBANDS Size of Dimension(s): 5
w0_thresh	4	32-bit floating point	Initially set to 0.7	unitless	Strongly Absorbing Aerosol Exclusion
tau_thresh	4	32-bit floating point	Initially set to 0.3	unitless	tau_thresh for AOT
ViCal_Coeff	28	32-bit floating point	Initially set to [1.0000, 1.0000, 1.0000, 1.0000, 1.0000. 1.0000, 1.0000]	unitless	Pre-multipliers to the M1 to M7 reflectances for performing Vicarious Calibration post-launch. 1 Dimensional Array: OCCBANDS Size of Dimension(s): 7
pad	4	32-bit floating point	MIN_VAL - MAX_VAL	unitless	Pad bytes.
File Size	**720 Bytes**				

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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 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	TestID	Quality Flag
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	700	Overall Ocean Color Quality for M1
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	701	Overall Ocean Color Quality for M2
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	702	Overall Ocean Color Quality for M3
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	703	Overall Ocean Color Quality for M4
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	704	Overall Ocean Color Quality for M5
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	705	Overall Chlorophyll a Concentration Quality
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	706	Overall IOP-a Quality at M1
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	707	Overall IOP-a Quality at M2
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	708	Overall IOP-a Quality at M3
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	709	Overall IOP-a Quality at M4
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	710	Overall IOP-a Quality at M5
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	711	Overall IOP-s Quality at M1
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	712	Overall IOP-s Quality at M2
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	713	Overall IOP-s Quality at M3
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	714	Overall IOP-s Quality at M4
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	715	Overall IOP-s Quality at M5
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	716	Exclusion Summary
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	717	Summary Ocean Color Range Check
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	718	Summary Chlorophyll Concentration Range Check
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	719	Summary IOP-a Range Check

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Algorithm	Product	TestID	Quality Flag
Ocean Color/Chlorophyll	VIIRS-OCC-EDR	720	Summary IOP-s Range Check

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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	XML Filename
1	474-00448-02-24_JPSS-OCC-DD-Part-24_0200E_VIIRS-OCC-EDR-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.