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

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 Snow Cover

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:

JPSS Configuration Management Office
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Greenbelt, MD 20771

Change History Log

Revision	Effective Date	Description of Changes (Reference the CCR & CCB/ERB Approve Date)	Sections Affected
0200-	Aug. 08, 2013	This version incorporates 474-CCR-13-1148 which was approved on the effective date shown.	All
0200A	Jan 16, 2014	This version incorporates 474-CCR-13-1406 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-14-2180 which was approved 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-16-2825 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

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 Snow Cover - Volume II: Data Dictionary contains the specifications for the format of the Snow Cover Binary Map and Snow Cover Fraction 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	Provides a description of the Ancillary and Auxiliary Data Inputs 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 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	Reference 470-00041, JPSS Program Lexicon
Attachment A	Provides the list of applicable xml files for 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
474-00448-01-29	JPSS Algorithm Specification Volume I: Software Requirements Specification (SRS) for the Snow Cover

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-S01-017	Joint Polar Satellite System (JPSS) VIIRS Snow Cover Algorithm Theoretical Basis Document (ATBD)
474-00448-03-29	Joint Polar Satellite System (JPSS) Algorithm Specification Volume III: Operational Algorithm Description (OAD) for the Snow Cover
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)

Document Number	Title
470-00041	Joint Polar Satellite System (JPSS) Program Lexicon
429-05-02-42	Joint Polar Satellite System (JPSS) Mission Data Format Control Book for NPP
472-00251	Joint Polar Satellite System (JPSS) Mission Data Format Control Book for JPSS-1
474-00001-01	Joint Polar Satellite System (JPSS) Common Data Format Control Book, Volume 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.

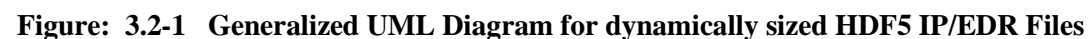
3.1 Intermediate Products and Environmental Data Records HDF5 Details - Statically Sized

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 (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 Algorithm Specification Volume II: Data Dictionary for the Common Algorithms (474-00448-02-01). 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".



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 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 Snow Cover

The VIIRS Snow Cover data product is separated into two deliverable EDRs, the VIIRS Snow Cover Binary Map and the VIIRS Snow Cover Fraction EDRs. The data format definitions for these two products are provided in the following sections.

5.1.1 VIIRS Snow Cover Binary Map EDR

Data Mnemonic	EDRE-SNCD-C1035 (Official) EDRE-SNCD-C1036 (Substitute)
Description/ Purpose	The Snow Cover Binary Map EDR is a snow/no snow binary map which classifies a pixel as snow or no snow from its values of Normalized Difference Snow Index (NDSI) and Normalized Difference Vegetation Index (NDVI). The Snow Cover Binary Map is at the VIIRS imagery resolution.
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: 5.1.1.1-1 VIIRS Snow Cover EDR Data Content Summary.
File Format Type	HDF5
Production Frequency	As per request
Data Content and Data Format	See Section 5.1.1.1, VIIRS Snow Cover Binary Map EDR Data Content Summary See Section 5.1.1.2, VIIRS Snow Cover Binary Map EDR Product Profile See Section 5.1.1.3, VIIRS Snow Cover Binary Map EDR HDF5 Details See Section 5.1.1.4, VIIRS Snow Cover Binary EDR Map HDF5 Metadata Details

	See Section 5.1.1.5, VIIRS Snow Cover EDR Binary Map EDR Geolocation Details
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5.1.1.1 VIIRS Snow Cover Binary Map EDR Data Content Summary**Table: 5.1.1.1-1 VIIRS Snow Cover EDR Data Content Summary**

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
SnowCoverBinaryMap	Snow Cover Binary Map	unsigned 8-bit char	[N*1536, 6400]	[1536, 6400]	unitless
QF1_VIIRSSCDBINAR YSNOWMAPEDR	Pixel Level Quality Flags	unsigned 8-bit char	[N*1536, 6400]	[1536, 6400]	unitless
QF2_VIIRSSCDBINAR YSNOWMAPEDR		unsigned 8-bit char	[N*1536, 6400]	[1536, 6400]	unitless
QF3_VIIRSSCDBINAR YSNOWMAPEDR		unsigned 8-bit char	[N*1536, 6400]	[1536, 6400]	unitless
File Size	39,321,600 Bytes				

5.1.1.2 VIIRS Snow Cover Binary Map EDR Product Profile**Table: 5.1.1.2-1 VIIRS Snow Cover Binary Map EDR Product Profile****VIIRS Snow Cover Binary Map Product Profile**

Fields													
Name	Data Size	Dimensions											
SnowCoverBinaryMap	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	
		Snow Cover Binary Map	0	MIN_VAL	MAX_VAL	unitless	No		unsigned 8-bit char	Name	Value	Name	Value
										NA_UINT8_FILL	255	Not a Snow Pixel	0
										MISS_UINT8_FILL	254	Snow Pixel	1
										ONBOARD_PT_UINT8_FILL	253		
										ONGROUND_PT_UINT8_FILL	252		
										ERR_UINT8_FILL	251		
										ELLIPSOID_UINT8_FILL	250		
										VDNE_UINT8_FILL	249		

VIIRS Snow Cover Binary Map Product Profile - Quality Flags

Fields													
Name	Data Size	Dimensions											
QF1_VIIRSSCDBINARYSNOWMAPEDR	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 Pixel Quality	0	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>High (Green)</td><td>0</td></tr><tr><td>Medium (Yellow)</td><td>1</td></tr><tr><td>Low (Red)</td><td>2</td></tr><tr><td>No Retrieval</td><td>3</td></tr></table>	Name	Value	High (Green)	0	Medium (Yellow)	1	Low (Red)	2	No Retrieval	3									
		Name	Value																										
		High (Green)	0																										
		Medium (Yellow)	1																										
		Low (Red)	2																										
		No Retrieval	3																										
		Input SDR Quality (I1, I2, I3)	2	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>Good</td><td>0</td></tr><tr><td>Bad</td><td>1</td></tr></table>	Name	Value	Good	0	Bad	1													
		Name	Value																										
		Good	0																										
		Bad	1																										
		Cloud Confidence	3	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>Confidently Clear</td><td>0</td></tr><tr><td>Probably Clear</td><td>1</td></tr><tr><td>Probably Cloudy</td><td>2</td></tr><tr><td>Confidently Cloudy</td><td>3</td></tr></table>	Name	Value	Confidently Clear	0	Probably Clear	1	Probably Cloudy	2	Confidently Cloudy	3									
		Name	Value																										
Confidently Clear	0																												
Probably Clear	1																												
Probably Cloudy	2																												
Confidently Cloudy	3																												
Solar Zenith Angle Exclusion (based on solar zenith angle > tunable threshold)	5	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No (no exclusion)</td><td>0</td></tr><tr><td>Yes (exclusion condition)</td><td>1</td></tr></table>	Name	Value	No (no exclusion)	0	Yes (exclusion condition)	1															
Name	Value																												
No (no exclusion)	0																												
Yes (exclusion condition)	1																												
Aerosol Optical Thickness Exclusion (based on slant path AOT > tunable threshold)	6	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No (no exclusion)</td><td>0</td></tr><tr><td>Yes (exclusion condition)</td><td>1</td></tr></table>	Name	Value	No (no exclusion)	0	Yes (exclusion condition)	1															
Name	Value																												
No (no exclusion)	0																												
Yes (exclusion condition)	1																												
Snow Fraction Exclusion (based on snow fraction between tunable thresholds)	7	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No (no exclusion)</td><td>0</td></tr><tr><td>Yes (exclusion condition)</td><td>1</td></tr></table>	Name	Value	No (no exclusion)	0	Yes (exclusion condition)	1															
Name	Value																												
No (no exclusion)	0																												
Yes (exclusion condition)	1																												
QF2_VIIRSSCDBINARYSNOWMAPEDR	1byte(s)	<table><tr><td>Name</td><td>Granule Boundary</td><td>Dynamic</td><td>Min Array Size</td><td>Max Array Size</td></tr><tr><td>AlongTrack</td><td>Yes</td><td>No</td><td>1536</td><td>1536</td></tr><tr><td>CrossTrack</td><td>No</td><td>No</td><td>6400</td><td>6400</td></tr></table>	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size	AlongTrack	Yes	No	1536	1536	CrossTrack	No	No	6400	6400												
		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																		
		Thin Cirrus (based on VCM thin cirrus quality flag)	0	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No</td><td>0</td></tr><tr><td>Yes (thin cirrus detected)</td><td>1</td></tr></table>	Name	Value	No	0	Yes (thin cirrus detected)	1	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No</td><td>0</td></tr><tr><td>Yes (thin cirrus detected)</td><td>1</td></tr></table>	Name	Value	No	0	Yes (thin cirrus detected)	1						
		Name	Value																										
		No	0																										
		Yes (thin cirrus detected)	1																										
		Name	Value																										
		No	0																										
Yes (thin cirrus detected)	1																												
Cloud Shadow	1	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No Cloud Shadow</td><td>0</td></tr><tr><td>Cloud Shadow</td><td>1</td></tr></table>	Name	Value	No Cloud Shadow	0	Cloud Shadow	1	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No Cloud Shadow</td><td>0</td></tr><tr><td>Cloud Shadow</td><td>1</td></tr></table>	Name	Value	No Cloud Shadow	0	Cloud Shadow	1								
Name	Value																												
No Cloud Shadow	0																												
Cloud Shadow	1																												
Name	Value																												
No Cloud Shadow	0																												
Cloud Shadow	1																												
Cloud Phase	2	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>Clear</td><td>0</td></tr><tr><td>Water</td><td>1</td></tr><tr><td>Ice</td><td>2</td></tr><tr><td>Mixed</td><td>3</td></tr></table>	Name	Value	Clear	0	Water	1	Ice	2	Mixed	3	<table><tr><td>Name</td><td>Value</td></tr><tr><td>Clear</td><td>0</td></tr><tr><td>Water</td><td>1</td></tr><tr><td>Ice</td><td>2</td></tr><tr><td>Mixed</td><td>3</td></tr></table>	Name	Value	Clear	0	Water	1	Ice	2	Mixed	3
Name	Value																												
Clear	0																												
Water	1																												
Ice	2																												
Mixed	3																												
Name	Value																												
Clear	0																												
Water	1																												
Ice	2																												
Mixed	3																												
Forest (VCM indicates Boreal/Conifer forest within the horizontal cell)	4	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No</td><td>0</td></tr><tr><td>Yes</td><td>1</td></tr></table>	Name	Value	No	0	Yes	1	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No</td><td>0</td></tr><tr><td>Yes</td><td>1</td></tr></table>	Name	Value	No	0	Yes	1								
Name	Value																												
No	0																												
Yes	1																												
Name	Value																												
No	0																												
Yes	1																												
Land/Water	5	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>Land</td><td>0</td></tr><tr><td>Coastal</td><td>1</td></tr><tr><td>Inland Water</td><td>2</td></tr><tr><td>Ocean</td><td>3</td></tr></table>	Name	Value	Land	0	Coastal	1	Inland Water	2	Ocean	3	<table><tr><td>Name</td><td>Value</td></tr><tr><td>Land</td><td>0</td></tr><tr><td>Coastal</td><td>1</td></tr><tr><td>Inland Water</td><td>2</td></tr><tr><td>Ocean</td><td>3</td></tr></table>	Name	Value	Land	0	Coastal	1	Inland Water	2	Ocean	3
Name	Value																												
Land	0																												
Coastal	1																												
Inland Water	2																												
Ocean	3																												
Name	Value																												
Land	0																												
Coastal	1																												
Inland Water	2																												
Ocean	3																												
Sun Glint	7	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No</td><td>0</td></tr><tr><td>Yes</td><td>1</td></tr></table>	Name	Value	No	0	Yes	1	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No</td><td>0</td></tr><tr><td>Yes</td><td>1</td></tr></table>	Name	Value	No	0	Yes	1								
Name	Value																												
No	0																												
Yes	1																												
Name	Value																												
No	0																												
Yes	1																												
QF3_VIIRSSCDBINARYSNOWMAPEDR	1byte(s)	<table><tr><td>Name</td><td>Granule Boundary</td><td>Dynamic</td><td>Min Array Size</td><td>Max Array Size</td></tr><tr><td>AlongTrack</td><td>Yes</td><td>No</td><td>1536</td><td>1536</td></tr><tr><td>CrossTrack</td><td>No</td><td>No</td><td>6400</td><td>6400</td></tr></table>	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size	AlongTrack	Yes	No	1536	1536	CrossTrack	No	No	6400	6400												
		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																		
		Thin Cirrus (based on VCM thin cirrus quality flag)	0	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No</td><td>0</td></tr><tr><td>Yes (thin cirrus detected)</td><td>1</td></tr></table>	Name	Value	No	0	Yes (thin cirrus detected)	1	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No</td><td>0</td></tr><tr><td>Yes (thin cirrus detected)</td><td>1</td></tr></table>	Name	Value	No	0	Yes (thin cirrus detected)	1						
		Name	Value																										
		No	0																										
		Yes (thin cirrus detected)	1																										
		Name	Value																										
		No	0																										
Yes (thin cirrus detected)	1																												
Cloud Shadow	1	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No Cloud Shadow</td><td>0</td></tr><tr><td>Cloud Shadow</td><td>1</td></tr></table>	Name	Value	No Cloud Shadow	0	Cloud Shadow	1	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No Cloud Shadow</td><td>0</td></tr><tr><td>Cloud Shadow</td><td>1</td></tr></table>	Name	Value	No Cloud Shadow	0	Cloud Shadow	1								
Name	Value																												
No Cloud Shadow	0																												
Cloud Shadow	1																												
Name	Value																												
No Cloud Shadow	0																												
Cloud Shadow	1																												
Cloud Phase	2	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>Clear</td><td>0</td></tr><tr><td>Water</td><td>1</td></tr><tr><td>Ice</td><td>2</td></tr><tr><td>Mixed</td><td>3</td></tr></table>	Name	Value	Clear	0	Water	1	Ice	2	Mixed	3	<table><tr><td>Name</td><td>Value</td></tr><tr><td>Clear</td><td>0</td></tr><tr><td>Water</td><td>1</td></tr><tr><td>Ice</td><td>2</td></tr><tr><td>Mixed</td><td>3</td></tr></table>	Name	Value	Clear	0	Water	1	Ice	2	Mixed	3
Name	Value																												
Clear	0																												
Water	1																												
Ice	2																												
Mixed	3																												
Name	Value																												
Clear	0																												
Water	1																												
Ice	2																												
Mixed	3																												
Forest (VCM indicates Boreal/Conifer forest within the horizontal cell)	4	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No</td><td>0</td></tr><tr><td>Yes</td><td>1</td></tr></table>	Name	Value	No	0	Yes	1	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No</td><td>0</td></tr><tr><td>Yes</td><td>1</td></tr></table>	Name	Value	No	0	Yes	1								
Name	Value																												
No	0																												
Yes	1																												
Name	Value																												
No	0																												
Yes	1																												
Land/Water	5	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>Land</td><td>0</td></tr><tr><td>Coastal</td><td>1</td></tr><tr><td>Inland Water</td><td>2</td></tr><tr><td>Ocean</td><td>3</td></tr></table>	Name	Value	Land	0	Coastal	1	Inland Water	2	Ocean	3	<table><tr><td>Name</td><td>Value</td></tr><tr><td>Land</td><td>0</td></tr><tr><td>Coastal</td><td>1</td></tr><tr><td>Inland Water</td><td>2</td></tr><tr><td>Ocean</td><td>3</td></tr></table>	Name	Value	Land	0	Coastal	1	Inland Water	2	Ocean	3
Name	Value																												
Land	0																												
Coastal	1																												
Inland Water	2																												
Ocean	3																												
Name	Value																												
Land	0																												
Coastal	1																												
Inland Water	2																												
Ocean	3																												
Sun Glint	7	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No</td><td>0</td></tr><tr><td>Yes</td><td>1</td></tr></table>	Name	Value	No	0	Yes	1	<table><tr><td>Name</td><td>Value</td></tr><tr><td>No</td><td>0</td></tr><tr><td>Yes</td><td>1</td></tr></table>	Name	Value	No	0	Yes	1								
Name	Value																												
No	0																												
Yes	1																												
Name	Value																												
No	0																												
Yes	1																												

		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
		Thermal Threshold Exceeded (based on brightness temperature > tunable threshold)	0	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value
										No	0
										Yes	1
		NDSI Quality	1	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value
										Good	0
										Bad	1
		NDVI Quality	2	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value
										Good	0
										Bad	1
		Fire	3	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value
										No	0
										Yes	1
		Spare	4	MIN_VAL	MAX_VAL	unitless	No		4 bit(s)	Name Value	Name Value

5.1.1.3 VIIRS Snow Cover Binary Map EDR HDF5 Details

Figure 3.1-1, VIIRS Snow Cover Binary Map UML Diagram, provides details on the contents and data types of the Snow Cover Binary Map product. This UML provides details at the product level detail only. In addition to this UML, refer to the Figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product, where the contents of Figure 5.1.1.3-1 are the 'Reference Regions' for the '<EDR/IP Collection Short Name>_Gran_n' class, where '<EDR/IP Collection Short Name>_Gran_n' would be 'VIIRS-SCD-BINARY-SNOW-MAP-EDR' for this product.

VIIRS-SCD-BINARY-SNOW-MAP-EDR
+SnowCoverBinaryMap : H5T_NATIVE_UCHAR
+QF1_VIIRSSCDBINARYSNOWMAPEDR : H5T_NATIVE_UCHAR
+QF2_VIIRSSCDBINARYSNOWMAPEDR : H5T_NATIVE_UCHAR
+QF3_VIIRSSCDBINARYSNOWMAPEDR : H5T_NATIVE_UCHAR

Figure: 5.1.1.3-1 VIIRS Snow Cover Binary Map EDR HDF5 UML Diagram

5.1.1.4 VIIRS Snow Cover Binary Map EDR HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Snow Cover Binary Map 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 5.1.1.4-1, VIIRS Snow Cover Binary Map 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 Snow Cover Binary Map.

Table: 5.1.1.4-1 VIIRS Snow Cover Binary Map Quality Summary Metadata Values

N_Quality_Summary			
Name	Value	Description	Comments
Exclusion Summary	0 - 100	Percent of pixels with exclusion conditions	
SnowCoverBinaryMap - Summary Quality	0 - 100	Percent of pixels within granule with high quality of retrieval	

5.1.1.5 VIIRS Snow Cover Binary Map EDR Geolocation Details

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

5.1.2 VIIRS Snow Cover Fraction EDR

Data Mnemonic	EDRE-SNCD-C1030 (Official) EDRE-SNCD-C1031 (Substitute)
Description/ Purpose	The VIIRS Snow Cover Fraction EDR is output at the VIIRS moderate resolution. The snow cover fraction is based off of the VIIRS Snow Cover

	<p>Binary Map and is calculated using a 2x2 pixel aggregation of the Snow Binary Map. Up to four imagery resolution snow/no snow pixels are used to calculate the snow fraction for a single moderate resolution pixel. The number of pixels used is provided in the “numberOfAggregatedPixels” field.</p> <p>Only those imagery resolution pixels that are designated as “snow” or “no snow” are used in the calculation. Those snow/no snow imagery resolution pixels that are filled (cloudy condition or other exclusion exists) are not used in the snow fraction calculation and are not counted in the “numberOfAggregatedPixels” field.</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: 5.1.2.1-1 VIIRS Snow Cover Fraction EDR Data Content Summary.</p> <p>This granule size includes VIIRS Snow Cover Fraction 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
Production Frequency	As per request
Data Content and Data Format	<p>See Section 5.1.2.1, VIIRS Snow Cover Fraction EDR Data Content Summary</p> <p>See Section 5.1.2.2, VIIRS Snow Cover Fraction EDR Product Profile</p> <p>See Section 5.1.2.3, VIIRS Snow Cover Fraction EDR HDF5 Details</p> <p>See Section 5.1.2.4, VIIRS Snow Cover Fraction EDR HDF5 Metadata Details</p> <p>See Section 5.1.2.5, VIIRS Snow Cover Fraction EDR Geolocation Details</p>

5.1.2.1 VIIRS Snow Cover Fraction EDR Data Content Summary**Table: 5.1.2.1-1 VIIRS Snow Cover Fraction EDR Data Content Summary**

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
SnowCoverFraction	Snow Cover Fraction calculated using the Snow Binary Map	unsigned 16-bit integer	[N*768, 3200]	[768, 3200]	unitless
NumberOfAggregatedPixels	Number of imagery resolution pixels from the snow binary map used to calculate the snow fraction (ranges from 0 to 4)	unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF1_VIIRSSCDBINARYSNOWFRACEDR	Pixel Level Quality Flags	unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF2_VIIRSSCDBINARYSNOWFRACEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF3_VIIRSSCDBINARYSNOWFRACEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
SnowCoverFractionFactors	Scale = First Array Element; Offset = 2nd Array Element	32-bit floating point	[N*2]	[2]	unitless
File Size	14,745,608 Bytes				

5.1.2.2 Snow Cover Fraction EDR Product Profile**Table: 5.1.2.2-1 VIIRS Snow Cover Fraction EDR Product Profile****VIIRS Snow Cover Fraction Product Profile**

Fields														
Name	Data Size	Dimensions												
SnowCoverFraction	2byte(s)													
		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size								
		AlongTrack	Yes	No	768	768								
		CrossTrack	No	No	3200	3200								
		Datum												
		Description			Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries
		Snow Cover Fraction calculated using the Snow Binary Map			0	0.00	1.00	unitless	Yes	SnowCoverFractionFactors	unsigned 16-bit integer	Name NA_UINT16_FILL	Value 65535	Name Value

VIIRS Snow Cover Fraction Product Profile - Quality Flags

17

QF2_VIIRSSCDBINARYSNOWFRACEDR	1byte(s)	<table><tr><td>Name</td><td>Granule Boundary</td><td>Dynamic</td><td>Min Array Size</td><td>Max Array Size</td></tr><tr><td>AlongTrack</td><td>Yes</td><td>No</td><td>768</td><td>768</td></tr><tr><td>CrossTrack</td><td>No</td><td>No</td><td>3200</td><td>3200</td></tr></table>	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size	AlongTrack	Yes	No	768	768	CrossTrack	No	No	3200	3200										
		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																
		Aerosol Optical Thickness Exclusion (based on slant path AOT > tunable threshold)	0	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name	Value															
											No (no exclusion)	0															
											Yes (exclusion condition)	1															
		Thin Cirrus (based on VCM thin cirrus quality flag)	1	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value																
											No	0															
											Yes	1															
		Cloud Shadow	2	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name	Value															
											No Cloud Shadow	0															
											Cloud Shadow	1															
		Cloud Phase	3	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	Name Value	Name	Value															
											Clear	0															
											Water	1															
											Ice	2															
											Mixed	3															
		Land/Water	5	MIN_VAL	MAX_VAL	unitless	No		2 bit(s)	Name Value	Name	Value															
											Land	0															
											Coastal	1															
											Inland Water	2															
											Ocean	3															
		Sun Glint	7	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name Value	Name Value																
											No	0															
	Yes									1																	

 QF3_VIIRSSCDBINARYSNOWFRACEDR | 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			
Spare	0	MIN_VAL	MAX_VAL	unitless	No		3 bit(s)	Name	Value	Name	Value	
Fire	3	MIN_VAL	MAX_VAL	unitless	No		1 bit(s)	Name	Value	Name	Value	
	No	0										
	Yes	1										
Spare	4	MIN_VAL	MAX_VAL	unitless	No		4 bit(s)	Name	Value	Name	Value	

VIIRS Snow Cover Fraction Product Profile - Scale Factors

Fields															
Name	Data Size	Dimensions													
SnowCoverFractionFactors	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

5.1.2.3 VIIRS Snow Cover Fraction EDR HDF5 Details

Figure 5.1.2.3-1, VIIRS Snow Cover Fraction UML Diagram, and equivalent Figure 5.1.1.3-1, VIIRS Snow Cover Binary Map EDR HDF5 UML Diagram, provides details on the contents and data types of the Snow Cover Fraction product. This UML provides details at the product level detail only. In addition to this UML, refer to Figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product, where the contents of Figure 5.1.2.3-1 are the 'Reference Regions' for the '<EDR/IP Collection Short Name>_Gran_n' class, where '<EDR/IP Collection Short Name>_Gran_n' would be 'VIIRS-SCD-BINARY-SNOW-FRAC-EDR' for this product.

VIIRS-SCD-BINARY-SNOW-FRAC-EDR	
+SnowCoverFraction :	H5T_NATIVE_USHORT
+NumberOfAggregatedPixels :	H5T_NATIVE_UCHAR
+QF1_VIIRSSCDBINARYSNOWFRACEDR :	H5T_NATIVE_UCHAR
+QF2_VIIRSSCDBINARYSNOWFRACEDR :	H5T_NATIVE_UCHAR
+QF3_VIIRSSCDBINARYSNOWFRACEDR :	H5T_NATIVE_UCHAR
+SnowCoverFractionFactors :	H5T_NATIVE_FLOAT

Figure: 5.1.2.3-1 VIIRS Snow Cover Fraction HDF5 UML Diagram

5.1.2.4 VIIRS Snow Cover Fraction EDR HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Snow Cover Fraction EDR are listed in the JPSS Algorithm Specification Vol 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 5.1.2.4-1, VIIRS Snow Cover Fraction 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 Snow Cover Fraction.

Table: 5.1.2.4-1 VIIRS Snow Cover Fraction Quality Summary Metadata Values

Quality Summary			
Name	Value	Description	Comments
Degradation Summary	0 - 100	Percent of pixels with degradation conditions	
Exclusion Summary	0 - 100	Percent of pixels with exclusion conditions	
Snow Cover Fraction - Summary Quality	0 - 100	Percent of pixels within granule with high quality of retrieval	

5.1.2.5 VIIRS Snow Cover Fraction EDR Geolocation Details

VIIRS Snow Cover Fraction is produced on the VIIRS Moderate Resolution Geolocation with terrain correction applied. See the JPSS Algorithm Specification Vol II: Data Dictionary for the VIIRS RDR/SDR (474-00448-02-06) Section 6.2, VIIRS Moderate 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 Snow Cover LUTs

7.1.1.1 VIIRS SCD Snow Cover Quality LUT

Data Mnemonic	NP_NU-LM0233-072
----------------------	------------------

Description/ Purpose	The VIIRS SCD Snow Cover Quality LUT file contains weight reduction factors for cloud contamination and degradation/ exclusion threshold limits. This file is used in the VIIRS Snow Cover EDR 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.
File Size	See Table: 7.1.1.1-1 VIIRS SCD Snow Cover Quality 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 SCD Snow Cover Quality LUT Data Format

Table: 7.1.1.1-1 VIIRS SCD Snow Cover Quality LUT Data Format

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
nbands_i	4	unsigned 32-bit integer	0 - MAX_VAL > 0	unitless	Number of Imagery Resolution Bands
nbands_m	4	unsigned 32-bit integer	0 - MAX_VAL > 0	unitless	Number of Moderate Resolution Bands
band_wgt	36	32-bit floating point	0.0 - 1.0	unitless	Default Moderate Resolution Band Weights 1 Dimensional Array: SCD_NBANDS_M Size of Dimension(s): 9
num_aot_bins	4	unsigned 32-bit integer	0 - MAX_VAL > 0	unitless	Number of AOT bins, corresponding to the number of AOT values used for thresholding (aot_bins, this table)
aot_bins	16	32-bit floating point	0.0 - 1.0	unitless	AOT Bin Boundary Values 1 Dimensional Array: SCD_NUM_AOT_BINS Size of Dimension(s): 4
num_thresh	4	unsigned 32-bit integer	0 - MAX_VAL > 0	unitless	Number of Solar Zenith Angle Thresholds
q_aot_sza	384	32-bit floating point	$0.0 \leq \text{sza} \leq (\pi)/2$	Radians	Solar Zenith Angle values that correspond to the Solar Zenith Angle quality regimes The order for each num_aot_bin x num_thresh matrix of angles is: I1, I2, I3, M1, M2, M3, M4, M5, M7, M8, M10, and M11 3 Dimensional Array:

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
					SCD_NUM_THRESH x SCD_NUM_AOT_BIN S x SCD_NBANDS_TOTAL Size of Dimension(s): 2 x 4 x 12
cot_switch	4	unsigned 32-bit integer	0 - 1	unitless	Switch to flag the availability of the Cloud Optical Thickness IP 0 = COT Not Available (Use VCM mode) 1 = COT Available (Use COT mode) Initially a placeholder - cot_switch is used in the code, but not from this field in this table. The cot_switch used in the code has been placed in the VIIRS Snow Cover/Depth Ephemeral PC, Table 3.2.2.5.17-1
num_cloud_types	4	unsigned 32-bit integer	0 - MAX_VAL > 0	unitless	Number of Cloud Types
cloud_wgts	336	32-bit floating point	0.0 - 1.0	unitless	Cloud weights corresponding to the 3 imagery bands + 9 moderate bands and the 7 cloud properties - 4 phases = Default (1), Water (2), Ice (3), Mixed (4), and 3 types = cirrus (5), shadow

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
					(6), adjacency (7); the parenthetical values correspond to the rows of the matrix shown in the "Range" cell, the column represent the bands I1, I2, I3, M1, M2, M3, M4, M5, M7, M8, M10, and M11 in this order. 2 Dimensional Array: SCD_NBANDS_TOT AL x SCD_NUM_CLOUD_TYPES Size of Dimension(s): 12 x 7
cot_gy	336	32-bit floating point	MIN_VAL - MAX_VAL	unitless	Cloud Optical Thickness 'GREEN/YELLOW' quality threshold values 2 Dimensional Array: SCD_NBANDS_TOT AL x SCD_NUM_CLOUD_TYPES Size of Dimension(s): 7 x 12
cot_yr	336	32-bit floating point	MIN_VAL - MAX_VAL	unitless	Cloud Optical Thickness 'YELLOW/RED' quality threshold values 2 Dimensional Array: SCD_NBANDS_TOT AL x SCD_NUM_CLOUD_TYPES

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
					Size of Dimension(s): 7 x 12
qwgt_r	48	32-bit floating point	0.0 - 1.0	unitless	Quality weight values for Solar Zenith Angle boundaries 'RED' 1 Dimensional Array: SCD_NBANDS_TOTAL Size of Dimension(s): 12
qwgt_y	48	32-bit floating point	0.0 - 1.0	unitless	Quality weight values for Solar Zenith Angle boundaries 'YELLOW' 1 Dimensional Array: SCD_NBANDS_TOTAL Size of Dimension(s): 12
qwgt_g	48	32-bit floating point	0.0 - 1.0	unitless	Quality weight values for Solar Zenith Angle boundaries 'GREEN' 1 Dimensional Array: SCD_NBANDS_TOTAL Size of Dimension(s): 12
frac_wgt_yr	4	32-bit floating point	0 - 1	unitless	Fractional Weight 'YELLOW/RED' Threshold
frac_wgt_gy	4	32-bit floating point	0 - 1	unitless	Fractional Weight 'GREEN/YELLOW' Threshold
sfrac_bmap_excl_thresh1	4	32-bit floating point	0 - 1	unitless	Tunable Snow fraction threshold lower limit for binary map exclusion

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
sfrac_bmap_excl_thres h2	4	32-bit floating point	0.0 - 1.0	unitless	Tunable Snow fraction threshold upper limit for binary map exclusion
sza_sfrac_degrad_thres h1	4	32-bit floating point	$0.0 \leq \text{sza} \leq (\pi)/2$	Radians	Tunable Solar zenith angle threshold lower limit for degraded snow fraction condition
sza_sfrac_degrad_thres h2	4	32-bit floating point	$0.0 \leq \text{sza} \leq (\pi)/2$	Radians	Tunable Solar zenith angle threshold upper limit for degraded snow fraction condition
sza_bmap_excl_thresh	4	32-bit floating point	$0.0 \leq \text{sza} \leq (\pi)/2$	Radians	Tunable Solar zenith angle threshold for binary map exclusion
sza_sfrac_excl_thresh	4	32-bit floating point	$0.0 \leq \text{sza} \leq (\pi)/2$	Radians	Tunable Solar zenith angle threshold for snow fraction exclusion
aot_excl_thresh	4	32-bit floating point	>0.0	unitless	Tunable Aerosol optical thickness exclusion threshold
sza_daynight_thresh	4	32-bit floating point	$0.0 \leq \text{sza} \leq (\pi)/2$	Radians	Tunable Solar zenith angle threshold for day to night transition
File Size	1,652 Bytes				

7.1.1.2 VIIRS SCD Snow Cover LUT

Data Mnemonic	NP_NU-LM0233-073
Description/ Purpose	The VIIRS SCD Snow Cover LUT file contains thresholds, switches, and coefficients used to derive TOA reflectance for each of the nine moderate resolution bands used for snow fraction. This file is used in the VIIRS Snow Cover EDR 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.
File Size	See Table: 7.1.1.2-1 VIIRS SCD Snow Cover 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 SCD Snow Cover LUT Data Format

Table: 7.1.1.2-1 VIIRS SCD Snow Cover LUT Data Format

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
nbands_m	4	unsigned 32-bit integer	1 - 9	unitless	Number of moderate resolution bands SCD_NBANDS_M
band_m	36	unsigned 32-bit integer	1 - 11	unitless	Band Numbers (nbands_m in size) 1 Dimensional Array: SCD_NBANDS_M Size of Dimension(s): 9
num_r_water	4	unsigned 32-bit integer	0 - MAX_VAL > 0	unitless	Number of water reflectance thresholds (For I1 and I2) SCD_NUM_R_WATER
r_water	8	32-bit floating point	0.0 - 1.0	unitless	Water Reflectance Thresholds (For I1 and I2) 1 Dimensional Array: SCD_NUM_R_WATER Size of Dimension(s): 2
ndsi_thre1	4	32-bit floating point	1.0 - 1.0	unitless	First NDSI Threshold
ndsi_thr2	4	32-bit floating point	1.0 - 1.0	unitless	Second NDSI Threshold
n_max_coeff	4	unsigned 32-bit integer	0 - MAX_VAL > 0	unitless	Number of NDVI Maximum Coefficients SCD_N_MAX_COEFF
ndvi_max_coeff	16	32-bit floating point	MIN_VAL - MAX_VAL	unitless	NDVI Maximum Coefficients 1 Dimensional Array: SCD_N_MAX_COEFF Size of Dimension(s): 4
n_min_coeff	4	unsigned 32-bit integer	0 - MAX_VAL > 0	unitless	Number of NDVI Minimum Coefficients SCD_N_MIN_COEFF

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
ndvi_min_coeff	8	32-bit floating point	MIN_VAL - MAX_VAL	unitless	NDVI Minimum Coefficients 1 Dimensional Array: SCD_N_MIN_COEFF Size of Dimension(s): 2
btmax	4	32-bit floating point	> 0.0	Kelvin	Tunable Brightness Temperature Threshold
ntypes	4	unsigned 32-bit integer	1 - 24	unitless	Number of Snow Types (6 grain size * 4 impurities = 24 types) (Initially a placeholder - Not used in code)
frac_option	4	unsigned 32-bit integer	0 - 2	unitless	Flag which determines which snow fraction algorithm to run 0 = Spectral Mixing Algorithm 1 = Binary Snow Map Aggregation 2 = Both Initially set to 1 as default
File Size	104 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 Coefficient

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 Snow Cover Automated PCs

The Snow Cover 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 Snow Cover Initialization PCs

The Snow Cover product currently uses no Initialization PCs.

7.2.2.2 VIIRS Snow Cover/Depth EDR Ephemeral PC

Data Mnemonic	DP_NU-LM2020-026
Description/ Purpose	The VIIRS Snow Cover/Depth 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 Snow Cover/Depth EDR Ephemeral PC.
File Format Type	Little Endian Binary

Production Frequency	As needed
Data Content and Data Format	For details see Table 7.2.2.2-1, VIIRS Snow Cover/Depth EDR Ephemeral PC Data Format

Table: 7.2.2.2-1 VIIRS Snow Cover/Depth EDR Ephemeral PC

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
cot_switch	4	unsigned 32-bit integer	0 - 1	unitless	Switch to flag the availability of the Cloud Optical Thickness IP 0 = COT Not Available (Use VCM mode) 1 = COT Available (Use COT mode) Initially set to zero
File Size	4 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 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	Test ID	Quality Flag
VIIRS Snow Cover	VIIRS-SCD-BINARY-SNOW-FRAC-EDR	900	Snow Cover Fraction - Summary Quality
VIIRS Snow Cover	VIIRS-SCD-BINARY-SNOW-FRAC-EDR	901	Degradation Summary
VIIRS Snow Cover	VIIRS-SCD-BINARY-SNOW-FRAC-EDR	902	Exclusion Summary
VIIRS Snow Cover	VIIRS-SCD-BINARY-SNOW-MAP-EDR	903	Snow Cover - Binary Map Quality
VIIRS Snow Cover	VIIRS-SCD-BINARY-SNOW-MAP-EDR	904	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	474-00448-02-29_JPSS-Snow-Cover-DD-Part-29_0200E_VIIRS-SCD-BINARY-SNOW-FRAC-EDR-PP.xml
2	474-00448-02-29_JPSS-Snow-Cover-DD-Part-29_0200E_VIIRS-SCD-BINARY-SNOW-MAP-EDR-PP.xml