GSFC JPSS CMO
08/06/2011
Released

Joint Polar Satellite System (JPSS) Ground Project
Code 474
474-00001-04-03

Joint Polar Satellite System (JPSS) Common Data Format Control Book – External Volume IV Part 3 - Land and Ocean/Water EDRs

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JPSS Common Data Format Control Book – External Volume IV Part 3 - Land and Ocean/Water EDRs

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Preface

This document is under JPSS Ground 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)
Original	03/31/2011	This version incorporates the following CCRs: **ECR-CGS-1096**: Updates QF2 description for the IST EDR for an inconsistency identified in the format definition); **CCR-474-10-0004** (ECR-CGS-0006: 1. Updated QF7 in Table 5.5.5.2-2, VIIRS Ocean Color Chlorophyll Product Profile - Quality Flags as per ECR A-295.; 2. Added XML Product Profiles to coincide with CDFCB-X Volume IV Parts 3.; 3. Correct CDFCB-X Volume IV Part 3 QF update - converted binary representation to decimal.) **CCR-474-11-0015** (ECR-CGS-0025: PCR025302 – Update to correct a typo in a wavelength, changing 8650nm to 865 nm for the VIIRS OCC EDR); and **474-CCR-11-0038 (**ECR-CGS-0043: This ECR provides updates to the CDFCB-X volumes III & IV XMLs to match the documentation. This is in support of the NPP pre-launch baseline documentation (IDPS Mx5). Please look in the ECR Drivers folder to find the change pages for these driving ECRs to compare to the new XML change pages. Drivers: ECR-CGS-0006, Updates to CDFCB-X-Vol-IV-Part-3; ECR-CGS-0025, Updates to CDFCB-X-Vol-IV-Part-3; V1 files include changes in quality flags 2 & 4. “% valid retrievals <” is added between values to match the CDFCB. An additional “=” is added before the value 100. Also, versions G1 and G2 to part 2 were combined to reduce number of documents. V2 adds back in the notes lost from the CCL G1_G2 file when it became V1. It also, at NASA’s request, combines the OMPS_NP_IP G1 and G2 files into a G1_G2 file. The following lists the affected documents for the changes listed above. All are xml updates to match the documentation. D34862-04-03_NPOESS-CDFCB-X-Vol-IV-Part-3_G2_VIIRS-OCC-EDR-PP_Ch_Pg) to create JPSS CDFCB, External, Volume 4, Part 3,(Land and Ocean/Water EDRs) Rev -. This was approved at the JPSS Ground ERB March 31, 2011.

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Engineering & Manufacturing Development (EMD) Phase
Acquisition & Operations Contract

CAGE NO. 11982

NPOESS Common Data Format Control Book - External Volume IV – Part III – Land and Ocean/Water EDRs

Document Date: 04/16/2010

Document Number: D34862-04-03
Revision: F

CDRL A014

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Contract No. F04701-02-C-0502

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Revision/Change Record

For Document No. D34862-04-03

Revision	Document Date	Revision/Change Description	Pages Affected
---	10/21/2005	Incorporation of the following ECRs: ECR 446C provides the Revision --- (initial submission) of this document. The following ECRs are included in this revision: • D34659 CIS ICD ECR 216C – Initial "Draft" Release • D31400-10 SARSAT System OPSCON SYS-020-060 ECR 229B – Rev A • SY15-0007 System Specification ECR 274A - Active Fires classification to an ARP • D34659 CIS ICD ECR 290C – Rev A • D37005 NPP EDR-PR v1.8 ECR 431B – Requirements Updates • D34862-01 CDFCB-X Vol. I ECR 445B – Rev A • D34862-04-03 CDFCB-X Vol. IV Part 3 ECR 446C – Initial Release	All
A	09/10/2007	Incorporation of the following DCOs and ECRs: ECR 617A provides the Revision A of this document. The following ECRs/DCOs are included in this revision: • ECR 515B, NPOESS Restructure Baseline • DCO A1 D34862-04-03 CDFCB-X Vol. IV Part 3 ECR 501C - Net Heat Flux EDR • ECR 530C, Two Sensor EDRs • DCO A2 D34862-04-03 CDFCB-X Vol. IV Part 3 ECR 588 - VIIRS Vegetation Index and Surface Type EDR • DCO A3 D34862-04-03 CDFCB-X Vol. IV Part 3 ECR 593A – OCC and SIC EDR • DCO A4 D34862-04-03 CDFCB-X Vol. IV Part 3 ECR 599A – VIIRS IST, LST, and SST EDR • DCO A5 D34862-04-03 CDFCB-X Vol. IV Part 3 ECR 611B – VIIRS Snow Cover EDRs o Incorporated ECR A-121A, VIIRS Snow Cover Update • ECR 617A CIDP CDFCB-X Vol. III and Vol. IV This revision also incorporates updates to the following: • Product Profile consistency updates	All

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For Document No. D34862-04-03

Revision	Document Date	Revision/Change Description	Pages Affected
B	07/07/2008	Incorporation of the following DCOs and ECRs: ECR 779A provides the Revision B of this document. The following ECRs/DCOs are included in this revision: • DCO B1 D34862-04-03 CDFCB-X Vol. IV Part 3 ECR 677B - SST and OCC EDR Updates • DCO B2 D34862-04-03 CDFCB-X Vol. IV Part 3 ECR 708B – Update of the VIIRS & CrIMSS EDR Geo Prod. Profile XML for the CDFCB-X Vol. IV • DCO B3 D34862-04-03 CDFCB-X Vol. IV Part3 ECR 751A – Update of the VIIRS EDR Prod. Profile XML	All
C	01/23/2009	Incorporation of the following DCOs and ECRs: ECR 898B provides Rev C. This rev incorporates the following DCO and ECR: • DCO C1 D34862-04-03 CDFCB-X Vol. IV Part 3 ECR 876 - Clean up of Clerical Error	All
D	06/04/2009	ECR 959A provides Rev D of this document. No DCOs have been incorporated into this revision.	All
E	12/09/2009	ECR 1014A incorporates the following changes: • Incorporated ECR A-251B, VIIRS SDR Cal & Geolocation Updates • Added (N=Number of Granules) to Aggregate Dimension column in the Product Data Content Summary tables throughout the document based on user request for clarity as to what 'N' is • Updated NHF QF definition to reference MIS in lieu of CMIS • Updated XML Product Profiles based on redlines to accompany document o D34862-04-03_NPOESS-CDFCB-X-Vol-IV-Part-3_E_VIIRS-NHF-EDR-PP.xml o D34862-04-03_NPOESS-CDFCB-X-Vol-IV-Part-3_E_VIIRS-NHF-EDR-GEO-PP.xml	4, 17, 25, 36, 45, 56, 68, 78, 90, 91, 95, 97, 102, 103, 107, 131

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Revision/Change Record

For Document No. D34862-04-03

Revision	Document Date	Revision/Change Description	Pages Affected
F	04/16/2010	ECR 1061D incorporates the following updates: • Removal of Availability Conditions throughout • Updated valid RangeMin/Max values for scaled products to align with CDFCB-X Volume I o VIIRS Land Surface Temperature EDR o VIIRS Snow Cover Fraction EDR o VIIRS Surface Type EDR o VIIRS Vegetation Index EDR o VIIRS Sea Surface Temperature o VIIRS Ice Surface Temperature • Updates to various quality flag descriptions, values, and Quality Summary metadata based on IPAC/Bubble testing results o VIIRS Land Surface Temperature EDR o VIIRS Snow Cover Binary Map o VIIRS Snow Cover Fraction o VIIRS Surface Type EDR o VIIRS Vegetation Index EDR o VIIRS Sea Surface Temperature EDR o VIIRS Ice Surface Temperature EDR o VIIRS Net Heat Flux EDR o VIIRS Ocean Color/Chlorophyll EDR o VIIRS Sea Ice Characterization EDR • Updated Net Heat Flux fill values - these fill values do not follow the standard convention as the convention conflicts with valid data values • Made Granule Size nomenclature consistent – 'Estimated Granule Size' throughout • Updated XML Product Profiles to match the redlines • Incorporation of Algorithm ECR A-277E, Sea Ice Age EDR Update - Table 5.5.7.2.2-2, VIIRS Sea Ice Characterization Product Profile – Quality Flags - updated Input data QF desciption in QF1 • Updated QF2 description for VIIRS SST EDR and VIIRS NHF EDR based on EDRPR approved updates, ECR A-297E	pp. 3, 14, 34, 44, 53, 55, 65, 76, 106, 130 pp. 5, 26, 38, 45, 57, 69 pp. 10-11, 23, 32-33, 40, 43, 52, 63, 74-75, 87-91, 93, 119-120, 124-125, 132, 137 pp. 77, 81-84 pp. 3, 16, 24, 34, 44, 55, 67, 76, 98, 106, 130 p. 133 p. 59

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5.4 Land Environmental Data Records

For an overview of the CDFCB-X and the list of reference documents, see the CDFCB-X Volume I - Overview, D34862-01. For an introduction to this volume, see the CDFCB-X, Volume IV, Part 1 - IPs, ARPs, and Geolocation Data, D34862-04-01.

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5.4.2 Land Surface Temperature

Data Mnemonic	EDRE-VLST-C0030 (Official) EDRE-VLST-C0031 (Substitute)
Description/ Purpose	The VIIRS LST algorithms are based on physical regression methods to retrieve skin LST. They use radiances sensed by VIIRS Infrared (IR) channels. Land Surface Temperature (LST) is defined as the skin temperature of the uppermost layer of the land surface. The LST EDR is required only for horizontal cells that are categorized as “confidently clear” by the cloud mask. Sensors: VIIRS Effectivity: NPP and NPOESS
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.
File Size	Estimated Granule Size: 11.72 MiB This granule size includes VIIRS Land Surface Temperature EDR related fields and quality flags only. Geolocation and metadata attributes are not included. Additional size added by HDF5 packaging is also not included.
File Format Type	HDF5
Data Content and Data Format	See Section 5.4.2.1, VIIRS Land Surface Temperature EDR Data Content Summary See Section 5.4.2.2, VIIRS Land Surface Temperature EDR Product Profile See Section 5.4.2.3, VIIRS Land Surface Temperature EDR HDF5 Details See Section 5.4.2.4, VIIRS Land Surface Temperature EDR HDF5 Metadata Details See Section 5.4.2.5, VIIRS Land Surface Temperature EDR Geolocation Details

5.4.2.1 VIIRS Land Surface Temperature EDR Data Content Summary

Table 5.4.2.1-1, VIIRS Land Surface Temperature EDR Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units

LandSurfaceTemperature	Land Surface Temperature	unsigned 16-bit integer	[N*768, 3200]	[768, 3200]	kelvin
QF1_VIIRSLSTEDR	Pixel level Quality Flags	unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF2_VIIRSLSTEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF3_VIIRSLSTEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
LSTFactors	Scale = First Array Element; Offset = 2nd Array Element	32-bit floating point	[N*2]	[2]	scale = unitless; offset = kelvin

5.4.2.2 VIIRS Land Surface Temperature EDR Product Profile

Table 5.4.2.2-1, VIIRS Land Surface Temperature EDR Product Profile

Name	Data Size	Dimensions
LandSurfaceTemperature	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	
								Name	Value	Name	Value
Land Surface Temperature	0	183.20	350.00	kelvin	Yes	LSTFactors	unsigned 16-bit integer	NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								ELINT_UINT16_FILL	65530		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

Table 5.4.2.2-2, VIIRS Land Surface Temperature EDR Product Profile – Quality Flags

Name	Data Size	Dimensions
QF1_VIIRSLSTEDR	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
LST Quality (Indicates the quality of the pixel level retrieval)	0			unitless	No		2 bit(s)	Name: Value:	Name: High, Value: 0; Name: Medium, Value: 1; Name: Low, Value: 2; Name: No Retrieval, Value: 3
Algorithm (Indicates which algorithm branch was implemented)	2			unitless	No		1 bit(s)	Name: Value:	Name: 4-Band Dual Split Window, Value: 0; Name: 2-Band Split Window, Value: 1
Day/Night	3			unitless	No		1 bit(s)	Name: Value:	Name: Night (Solar Zenith Angle > 85 Degrees), Value: 0; Name: Day (Solar Zenith Angle <= 85 degrees), Value: 1
Bad SWIR Pixel (M12 and M13 band data not available)	4			unitless	No		1 bit(s)	Name: Value:	Name: Both Available, Value: 0; Name: At least one not available, Value: 1
Bad LWIR Pixel (M15 and M16 band data not available)	5			unitless	No		1 bit(s)	Name: Value:	Name: Both Available, Value: 0; Name: At least one not available, Value: 1
Exclusion - Fire detected in pixel (from the VIIRS Cloud Mask)	6			unitless	No		1 bit(s)	Name: Value:	Name: False, Value: 0; Name: True, Value: 1
Exclusion – Thin Cirrus (Retrieval performance exclusion due to thin cirrus detection by VIIRS Cloud Mask)	7			unitless	No		1 bit(s)	Name: Value:	Name: False, Value: 0; Name: True, Value: 1

QF2_VIIRSLSTEDR 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
Degradation - Sensor Zenith Angle > 40 degrees	0			unitless	No		1 bit(s)	Name: Value:	Name: False, Value: 0; Name: True, Value: 1
Out of Expected Range - The LST derived from the algorithm is outside of the NPOESS System Specification Validated Range defined by 213K < BT(M16) < 343K	1			unitless	No		1 bit(s)	Name: Value:	Name: False, Value: 0; Name: True, Value: 1
Cloud Confidence Indicator	2			unitless	No		2 bit(s)	Name: Value:	Name: Confidently Clear, Value: 0; Name: Probably Clear, Value: 1; Name: Probably Cloudy, Value: 2; Name: Confidently Cloudy, Value: 3
Exclusion: AOT > 1.0 (AOT in horizontal cell > 1.0 on the slant path (AOT @550nm))	4			unitless	No		1 bit(s)	Name: Value:	Name: False, Value: 0; Name: True, Value: 1
Exclusion - Horizontal Cell Size > 1.3km (HCS > 1.3 km, swath width > 1700 km, Sensor Zenith Angle > 53.0 degrees)	5			unitless	No		1 bit(s)	Name: Value:	Name: False, Value: 0; Name: True, Value: 1
Sun Glint in pixel (as indicated in the VIIRS Cloud Mask)	6			unitless	No		1 bit(s)	Name: Value:	Name: False, Value: 0; Name: True, Value: 1
Inside Terminator (85 deg < Solar Zenith Angle <= 100 deg)	7			unitless	No		1 bit(s)	Name: Value:	Name: False, Value: 0; Name: True, Value: 1

QF3_VIIRSLSTEDR 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	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor	Data Type	Fill Values	Legend Entries

				Min				Name			
		Land/Water Background	0			unitless	No		3 bit(s)	Name Value	Name Value Land and Desert 0 Land/No Desert 1 Inland Water 2 Sea Water 3 Coastal 5
		Surface Type (of the LST Retrieval)	3			unitless	No		5 bit(s)	Name Value	Name Value Evergreen Needleleaf Forests 1 Evergreen Broadleaf Forests 2 Deciduous Needleleaf Forests 3 Deciduous Broadleaf Forests 4 Mixed Forests 5 Closed Shrublands 6 Open Shrublands 7 Woody Savannahs 8 Savannahs 9 Grasslands 10 Permanent Wetlands 11 Croplands 12 Urban and Build-up 13 Cropland/Natural Vegetation Mosaics 14 Snow and Ice 15 Barren 16 Water 17 Fill 31

Table 5.4.2.2-3, VIIRS Land Surface Temperature EDR Product Profile – Factors

Name	Data Size	Dimensions
LSTFactors	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	
								Name	Value	Name	Value
Scale = First Array Element; Offset = 2nd Array Element	0			scale = unitless; offset = kelvin	No		32-bit floating point				

5.4.2.3 VIIRS Land Surface Temperature EDR HDF5 Details

Figure 5.4.2.3-1, VIIRS Land Surface Temperature EDR UML Diagram, provides details on the contents and data types of the Land Surface Temperature EDR product. This UML provides details at the product level detail only. In addition to this UML, refer to the CDFCB-X, Volume IV, Part 1, D34862-04-01, Figure 1.2.1-1, Figure 1.2.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

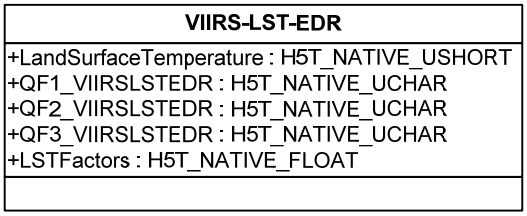

Figure 5.4.2.3-1, VIIRS Land Surface Temperature EDR HDF5 UML Diagram

5.4.2.4 VIIRS Land Surface Temperature EDR HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Land Surface Temperature EDR are listed in the CDFCB-X Volume V – Metadata, D34862-05. 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 5.4.2.4-1, VIIRS Land Surface Temperature EDR N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level 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 Land Surface Temperature EDR.

Table 5.4.2.4-1, VIIRS Land Surface Temperature EDR N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Notes**
Land Surface Temperature EDR Summary Quality	0 – 100	Percent of pixels within granule with high quality of retrieval	

N_Quality_Summary			
Name	**Value**	**Description**	**Notes**
Exclusion Summary	0 – 100	Percent of pixels with excluded conditions	
Summary Range Check	0 – 100	Percent of retrieved pixels outside of expected range (213K to 343K)	
SDR Input Data Quality	0 – 100	Percent of pixels with high quality input values of brightness temperature in VIIRS SDR	
Surface Type Input Data Quality	0 – 100	Percent of pixels with high quality input values for Surface Type	
VCM Input Data Quality	0 – 100	Percent of pixels with high quality input values for the VIIRS Cloud Mask	
AOT Input Data Quality	0 – 100	Percent of pixels with high quality input values for AOT (valid only during day)	
No Land Coverage	0	At least one land pixel in granule	
	1	No land pixels in granule	

5.4.2.5 VIIRS Land Surface Temperature EDR Geolocation Details

VIIRS Land Surface Temperature is produced on the VIIRS Moderate Resolution Geolocation – Terrain Corrected. See the CDFCB-X, Volume IV, Part 1, D34862-04-01, Section 4.9.5, VIIRS Moderate Resolution Geolocation – Terrain Corrected for details.

5.4.3 DELETED

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5.4.5 Snow Cover/Depth

The Snow Cover/Depth EDR provides the horizontal and vertical extent of snow cover. In addition, a binary product will give a “snow/no snow” flag.

A cell is clear for the Snow Cover/Depth EDR if it is classified as “confidently clear” by the cloud mask.

Sensors	VIIRS
Effectivity	For NPP, only the VIIRS EDR is available
EDR Contents	For each pixel, the Snow Cover/Depth EDR contains: Snow fraction data Weight data Quality flags

5.4.5.1 DELETED

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5.4.5.2 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.

5.4.5.2.1 VIIRS Snow Cover Binary Map

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 CDFCB-X Volume I, D34862-01, Section 3.4 for details.
File Size	Estimated Granule Size: 37.5 MiB This granule size includes VIIRS Snow Cover Binary Map related fields and quality flags only. Geolocation and metadata attributes are not included. Additional size added by HDF5 packaging is also not included.
File Format Type	HDF5
Production Frequency	As per request
Data Content and Data Format	See Section 5.4.5.2.1.1, VIIRS Snow Cover Binary Map Data Content Summary See Section 5.4.5.2.1.2, VIIRS Snow Cover Binary Map Product Profile See Section 5.4.5.2.1.3, VIIRS Snow Cover Binary Map HDF5 Details See Section 5.4.5.2.1.4, VIIRS Snow Cover Binary Map HDF5 Metadata Details See Section 5.4.5.2.1.5, VIIRS Snow Cover Binary Map Geolocation Details

5.4.5.2.1.1 VIIRS Snow Cover Binary Map Data Content Summary

Table 5.4.5.2.1.1-1, VIIRS Snow Cover Binary Map Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
SnowCoverBinaryMap	Snow Cover Binary Map	unsigned 8-bit char	[N*1536, 6400]	[1536, 6400]	unitless
QF1_VIIRSSCDBINARYSNOWMAPEDR	Pixel Level Quality Flags	unsigned 8-bit char	[N*1536, 6400]	[1536, 6400]	unitless
QF2_VIIRSSCDBINARYSNOWMAPEDR		unsigned 8-bit char	[N*1536, 6400]	[1536, 6400]	unitless
QF3_VIIRSSCDBINARYSNOWMAPEDR		unsigned 8-bit char	[N*1536, 6400]	[1536, 6400]	unitless

5.4.5.2.1.2 VIIRS Snow Cover Binary Map Product Profile

Table 5.4.5.2.1.2-1, 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			unitless	No		unsigned 8-bit char	**Name**	**Value**	**Name**	**Value**		
										NA_UINT8_FILL	255	Not a Snow Pixel	0		
										MISS_UINT8_FILL	254				
										ONBOARD_PT_UINT8_FILL	253				
										ONGROUND_PT_UINT8_FILL	252	Snow Pixel	1		
										ERR_UINT8_FILL	251				
										ELINT_UINT8_FILL	250				
										VDNE_UINT8_FILL	249				

Table 5.4.5.2.1.2-2, 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			unitless	No		2 bit(s)	Name / Value	Name / Value: High (Green) 0; Medium (Yellow) 1; Low (Red) 2; No Retrieval 3
Input SDR Quality (I1, I2, I3)	2			unitless	No		1 bit(s)	Name / Value	Name / Value: Good 0; Bad 1
Cloud Confidence	3			unitless	No		2 bit(s)	Name / Value	Name / Value: Confidently Clear 0; Probably Clear 1; Probably Cloudy 2; Confidently Cloudy 3
Solar Zenith Angle Exclusion	5			unitless	No		1 bit(s)	Name / Value	Name / Value: No (no exclusion) 0; Yes (exclusion condition: solar zenith angle > 60 deg) 1
Aerosol Optical Thickness Exclusion	6			unitless	No		1 bit(s)	Name / Value	Name / Value: No (no exclusion) 0; Yes (exclusion condition: AOT > 1.0) 1
Snow Fraction Exclusion	7			unitless	No		1 bit(s)	Name / Value	Name / Value: No (no exclusion) **0**; Yes (exclusion condition: snow fraction between 0.2 and 0.7) **1**

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QF2_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**	
		Thin Cirrus (based on VCM thin cirrus quality flag)	0			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**
												No	0
												Yes (thin cirrus detected)	1
		Cloud Shadow	1			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**
												No Cloud Shadow	0
												Cloud Shadow	1
		Cloud Phase	2			unitless	No		2 bit(s)	**Name**	**Value**	**Name**	**Value**
												Clear	0
												Water	1
												Ice	2
												Mixed	3
		Forest (VCM indicates Boreal/Conifor forest within the horizontal cell)	4			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**
												No	0
												Yes	1
		Land/Water	5			unitless	No		2 bit(s)	**Name**	**Value**	**Name**	**Value**
												Land	0
												Coastal	1
												Inland Water	2
												Ocean	3
		Sun Glint	7			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**
												No	0
												Yes	1
QF3_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**	

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		Thermal Threshold Exceeded	0			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**	
												No	0	
												Yes	1	
		NDSI Quality	1			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**	
												Good	0	
												Bad	1	
		NDVI Quality	2			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**	
												Good	0	
												Bad	1	
		Fire	3			Unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**	
												No	0	
												Yes	1	
		spare	4			unitless	No		4 bit(s)	**Name**	**Value**	**Name**	**Value**	

5.4.5.2.1.3 VIIRS Snow Cover Binary Map HDF5 Details

Figure 5.4.5.2.1.3-1, 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 CDFCB-X, Volume IV, Part 1, D34862-04-01, Figure 1.2.1-1, Figure 1.2.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of 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 5.4.5.2.1.3-1, VIIRS Snow Cover Binary Map HDF5 UML Diagram

5.4.5.2.1.4 VIIRS Snow Cover Binary Map HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Snow Cover Binary Map EDR are listed in the CDFCB-X Volume V – Metadata, D34862-05. 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 5.4.5.2.1.4-1, VIIRS Snow Cover Binary Map N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level 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 5.4.5.2.1.4-1, VIIRS Snow Cover Binary Map N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level Metadata Values

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

5.4.5.2.1.5 VIIRS Snow Cover Binary Map Geolocation Details

VIIRS Snow Cover Binary Map is produced on the VIIRS Imagery Resolution Geolocation – Terrain Corrected. See the CDFCB-X, Volume IV, Part 1, D34862-04-01, Section 4.9.5, VIIRS Moderate Resolution Geolocation – Terrain Corrected, for details.

5.4.5.2.2 VIIRS Snow Cover Fraction

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 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. 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.
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.
File Size	Estimated Granule Size: 14.06 MiB 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.
File Format Type	HDF5
Production Frequency	As per request
Data Content and Data Format	See Section 5.4.5.2.2.1, VIIRS Snow Cover Fraction Data Content Summary See Section 5.4.5.2.2.2, VIIRS Snow Cover Fraction Product Profile See Section 5.4.5.2.2.3, VIIRS Snow Cover Fraction HDF5 Details See Section 5.4.5.2.2.4, VIIRS Snow Cover Fraction HDF5 Metadata Details See Section 5.4.5.2.2.5, VIIRS Snow Cover Fraction Geolocation Details

5.4.5.2.2.1 VIIRS Snow Cover Fraction Data Content Summary

Table 5.4.5.2.2.1-1, VIIRS Snow Cover Fraction Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	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

5.4.5.2.2.2 VIIRS Snow Cover Fraction Product Profile

Table 5.4.5.2.2.2-1, 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**	**Value**		**Name**	**Value**			
										NA_UINT16_FILL	65535						
										MISS_UINT16_FILL	65534						
										ONBOARD_PT_UINT16_FILL	65533						
										ONGROUND_PT_UINT16_FILL	65532						
										ERR_UINT16_FILL	65531						
										ELINT_UINT16_FILL	65530						
										VDNE_UINT16_FILL	65529						
										SOUB_UINT16_FILL	65528						
NumberOfAggregatedPixels	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**				
		Number of imagery resolution pixels from the snow	0			unitless	No		unsigned 8-bit char	**Name**	**Value**		**Name**	**Value**			
										NA_UINT8_FILL	255						

		binary map used to calculate the snow fraction (ranges from 0 to 4)								MISS_UINT8_FILL	254	
										ONBOARD_PT_UINT8_FILL	253	
										ONGROUND_PT_UINT8_FILL	252	
										ERR_UINT8_FILL	251	
										ELINT_UINT8_FILL	250	
										VDNE_UINT8_FILL	249	

Table 5.4.5.2.2.2-2, VIIRS Snow Cover Fraction Product Profile – Quality Flags

Fields

Name	Data Size	Dimensions
QF1_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
Overall Pixel Quality	0			unitless	No		2 bit(s)	Name / Value:	Name / Value: High (Green) 0; Medium (Yellow) 1; Low (Red) 2; No Retrieval 3
Input SDR Quality (I1, I2, I3)	2			unitless	No		1 bit(s)	Name / Value:	Name / Value: Good 0; Bad 1
Cloud Confidence	3			unitless	No		2 bit(s)	Name / Value:	Name / Value: Confidently Clear 0; Probably Clear 1; Probably Cloudy 2; Confidently Cloudy 3
Solar Zenith Angle Degradation (70 deg < Solar Zenith Angle <= 85 deg)	5			unitless	No		1 bit(s)	Name / Value:	Name / Value: No (no degradation) 0; Yes (degradation) 1
Forest Exclusion (VCM indicates Boreal/Conifor forest within the horizontal cell)	6			unitless	No		1 bit(s)	Name / Value:	Name / Value: No 0; Yes 1

		Solar Zenith Angle Exclusion	7			unitless	No		1 bit(s)	Name / Value	Name	Value
											No (no exclusion)	0
											Yes (exclusion condition: solar zenith angle > 85 deg)	1

QF2_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
Aerosol Optical Thickness Exclusion	0			unitless	No		1 bit(s)	Name / Value	Name / Value: No (no exclusion) 0; Yes (exclusion condition: AOT > 1.0 based on slant path AOT) 1
Thin Cirrus (based on VCM thin cirrus quality flag)	1			unitless	No		1 bit(s)	Name / Value	Name / Value: No 0; Yes (thin cirrus detected based on VCM thin cirrus quality flag) 1
Cloud Shadow	2			unitless	No		1 bit(s)	Name / Value	Name / Value: No Cloud Shadow 0; Cloud Shadow 1
Cloud Phase	3			unitless	No		2 bit(s)	Name / Value	Name / Value: Clear 0; Water 1; Ice 2; Mixed 3
Land/Water	5			unitless	No		2 bit(s)	Name / Value	Name / Value: Land 0; Coastal 1; Inland Water 2; Ocean 3

		Sun Glint	7			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			unitless	No		3 bit(s)	**Name**	**Value**	**Name**	**Value**	
		Fire	3			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**	
												No	0	
												Yes	1	
		spare	4			unitless	No		4 bit(s)	**Name**	**Value**	**Name**	**Value**	

Table 5.4.5.2.2.2-3, VIIRS Snow Cover Fraction Product Profile – 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			unitless	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**

5.4.5.2.2.3 VIIRS Snow Cover Fraction HDF5 Details

Figure 5.4.5.2.2.3-1, VIIRS Snow Cover Fraction 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 the CDFCB-X, Volume IV, Part 1, D34862-04-01, Figure 1.2.1-1, Figure 1.2.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

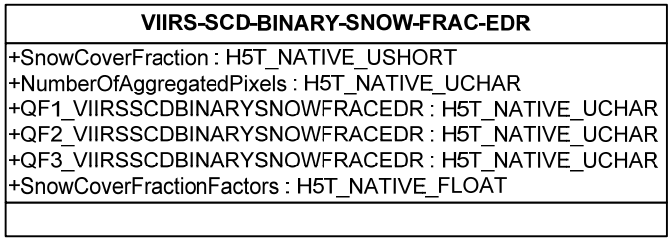

Figure 5.4.5.2.2.3-1, VIIRS Snow Cover Fraction HDF5 UML Diagram

5.4.5.2.2.4 VIIRS Snow Cover Fraction HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Snow Cover Fraction EDR are listed in the CDFCB-X Volume V – Metadata, D34862-05. 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 5.4.5.2.2.4-1, VIIRS Snow Cover Fraction N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level 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 5.4.5.2.2.4-1, VIIRS Snow Cover Fraction N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Notes**
Snow Cover Fraction - Summary Quality	0 – 100	Percent of pixels within granule with high quality of retrieval	

N_Quality_Summary			
Name	**Value**	**Description**	**Notes**
Exclusion Summary	0 – 100	Percent of pixels with exclusion conditions	
Degradation Summary	0 – 100	Percent of pixels with degradation conditions	

5.4.5.2.2.5 VIIRS Snow Cover Fraction Geolocation Details

VIIRS Snow Cover Fraction is produced on the VIIRS Imagery Resolution Geolocation with terrain correction applied. See the CDFCB-X, Volume IV, Part 1, D34862-04-01, Section 4.9.5, VIIRS Moderate Resolution Geolocation – Terrain Corrected, for details.

5.4.6 VIIRS Surface Type EDR

Data Mnemonic	EDRE-VSTV-C0030 (Official) EDRE-VSTV-C0031 (Substitute)
Description/ Purpose	Surface type is defined as one of the seventeen International Geosphere Biosphere Program (IGBP) classes; see Table 5.4.6-1, Land Cover Classifications. The Surface Type EDR consists of a determination of surface types, which are based on the last orbit's data where possible (requires cloud-free pixels, a solar zenith angle of less than 70 degrees, and a sun-glint angle of greater than 36 degrees). The confidence value in QF3_VIIRSSTEDR is provided in percent ranging from 0 – 100. The value of 247 in this field indicates that the surface type is defined by the NIMA Vector Map (VMap) Level 0. Sensors: VIIRS Effectivity: NPP and NPOESS
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.
File Size	Estimated Granule Size: 11.7 MiB This granule size includes VIIRS Surface Type EDR related fields and quality flags only. Geolocation and metadata attributes are not included. Additional size added by HDF5 packaging is also not included.
File Format Type	HDF5
Data Content and Data Format	See Section 5.4.6.1, VIIRS Surface Type EDR Data Content Summary See Section 5.4.6.2, VIIRS Surface Type EDR Product Profile See Section 5.4.6.3, VIIRS Surface Type EDR HDF5 Details See Section 5.4.6.4, VIIRS Surface Type EDR HDF5 Metadata Details See Section 5.4.6.5, VIIRS Surface Type EDR Geolocation Details

Table 5.4.6-1, Land Cover Classifications

Land Cover Class	Definition
Evergreen Needleleaf Forests	Lands dominated by woody vegetation with a percent cover >60% and height exceeding 2 meters. Almost all trees remain green all year. Canopy is never without green foliage.
Deciduous Needleleaf Forests	Lands dominated by woody vegetation with a percent cover >60% and height exceeding 2 meters. Consists of seasonal, needleleaf tree communities with an annual cycle of leaf-on and leaf-off periods.
Evergreen Broadleaf Forests	Lands dominated by woody vegetation with a percent cover >60% and height exceeding 2 meters. Almost all trees and shrubs remain green all year. Canopy is never without green foliage.
Deciduous Broadleaf Forests	Lands dominated by woody vegetation with a percent cover >60% and height exceeding 2 meters. Consists of broadleaf tree communities with an annual cycle of leaf-on and leaf-off periods.
Mixed Forests	Lands dominated by woody vegetation with a percent cover >60% and height exceeding 2 meters. Consists of tree communities with interspersed mixtures or mosaics of the other four forest types. None of the forest types exceeds 60% of landscape.
Closed Shrublands	Lands with woody vegetation less than 2 meters tall and with shrub canopy cover >60%. The shrub foliage can be either evergreen or deciduous.
Open Shrublands	Lands with woody vegetation less than 2 meters tall and with shrub canopy cover between 10-60%. The shrub foliage can be either evergreen or deciduous.
Woody Savannas	Lands with herbaceous and other understory systems and with forest canopy cover between 30-60%. The forest cover height exceeds 2 meters.
Savannas	Lands with herbaceous and other understory systems and with forest canopy cover between 10-30%. The forest cover height exceeds 2 meters.
Grasslands	Lands with herbaceous types of cover. Tree and shrub cover is less than 10%.
Permanent Wetlands	Lands with a permanent mixture of water and herbaceous or woody vegetation. The vegetation can be present in either salt, brackish, or fresh water.
Croplands	Lands covered with temporary crops followed by harvest and a bare soil period (e.g., single and multiple cropping systems). Note that perennial woody crops will be classified as the appropriate forest or shrubland cover type.
Urban and Built-Up	Land covered by buildings and other man-made structures.
Cropland/Natural Vegetation Mosaics	Lands with a mosaic of croplands, forests, shrubland, and grasslands in which no one component comprises more than 60% of the landscape.
Snow and Ice	Lands under snow/ice cover.

Land Cover Class	Definition
Barren	Lands with exposed soil, sand, rocks, or snow and never having more than 10% vegetative cover during any time of the year.
Water Bodies	Oceans, seas, lakes, reservoirs, and rivers. Can be either fresh or salt-water bodies.

5.4.6.1 VIIRS Surface Type EDR Data Content Summary

Table 5.4.6.1-1, VIIRS Surface Type EDR Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
SurfaceType	Surface Type	unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
VegetationFraction	Vegetation Fraction	unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF1_VIIRSSTEDR	Pixel Level Quality Flags	unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF2_VIIRSSTEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
Confidence	QST IP Pixel Confidence (Pixel level confidence in percent for each of the Surface Types). Quality flowed down from QST IP Surface Type Confidence. Confidence associated with IGBP Surface Type Classification. Values 0 – 100 = percent confidence. 247 = Surface Type defined by NIMA Vector Map (VMap) Level 0	unsigned 8-bit char	[N*768, 3200]	[768, 3200]	percent
VegetationFractionFactors	Scale = First Array Element; Offset = 2nd Array Element	32-bit floating point	[N*2]	[2]	unitless

5.4.6.2 VIIRS Surface Type EDR Product Profile

Table 5.4.6.2-1, VIIRS Surface Type EDR Product Profile

Fields															
Name	**Data Size**	**Dimensions**													
SurfaceType	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**	
		Surface Type	0			unitless	No		unsigned 8-bit char	**Name**	**Value**	**Name**	**Value**
										NA_UINT8_FILL	255	Evergreen Needleleaf Forests	1
										MISS_UINT8_FILL	254	Evergreen Broadleaf Forests	2
										ONBOARD_PT_UINT8_FILL	253	Deciduous Needleleaf Forests	3
										ONGROUND_PT_UINT8_FILL	252	Deciduous Broadleaf Forests	4
										ERR_UINT8_FILL	251	Mixed Forests	5
										ELLIPSOID_UINT8_FILL	250	Closed Shrublands	6
										VDNE_UINT8_FILL	249	Open Shrublands	7
										SOUB_UINT8_FILL	248	Woody Savannas	8
												Savannas	9
												Grasslands	10
												Permanent Wetlands	11
												Croplands	12
												Urban and Built-up	13
												Cropland/Natural Vegetation Mosaics	14
												Snow and Ice	15
												Barren or sparsely vegetated	16
												Water	17
VegetationFraction	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		AlongTrack	Yes	No	768	768							

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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
Vegetation Fraction	0	0	1	unitless	Yes	VegetationFractionFactors	unsigned 8-bit char	NA_UINT8_FILL	255		
								MISS_UINT8_FILL	254		
								ONBOARD_PT_UINT8_FILL	253		
								ONGROUND_PT_UINT8_FILL	252		
								ERR_UINT8_FILL	251		
								ELINT_UINT8_FILL	250		
								VDNE_UINT8_FILL	249		
								SOUB_UINT8_FILL	248		

Table 5.4.6.2-2, VIIRS Surface Type EDR Product Profile – Quality Flags

Fields

Name	Data Size	Dimensions
QF1_VIIRSSTEDR	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 (Name / Value)	Legend Entries (Name / Value)
Fire detected in pixel (from the VIIRS Cloud Mask)	0			unitless	No		1 bit(s)		False 0 True 1
Snow or Ice in Pixel (from the VIIRS Cloud Mask)	1			unitless	No		1 bit(s)		False 0 True 1
Vegetation in Pixel (Vegetation fraction detected within the pixel exceeded threshold)	2			unitless	No		1 bit(s)		False 0 True 1
Cloud Confidence Indicator (Indication of whether 'M' band pixel confidently clear, probably clear, probably cloudy or confidently cloudy)	3			unitless	No		2 bit(s)		Confidently Clear 0 Probably Clear 1 Probably Cloudy 2 Confidently Cloudy 3
Exclusion - Sun Glint in pixel (as indicated in the VIIRS Cloud Mask)	5			unitless	No		1 bit(s)		False 0 True 1
Input Data Quality degraded/bad (Quality of Surface Type is degraded or not retrieved due to bad surface reflectance data in horizontal cell)	6			unitless	No		1 bit(s)		False 0 True 1
Spare	7			unitless	No		1 bit(s)		

Name	Data Size	Dimensions
QF2_VIIRSSTEDR	1byte(s)	

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

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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: AOT > 1.0 (AOT in horizontal cell > 1.0 on the slant path (AOT @550nm))	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Vegetation fraction out of range (Veg Frac < 0 or Veg Frac > 1))	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Exclusion: Solar Zenith Angle (Solar Zenith Angle at center of Horizontal Cell. Exclusion condition exists when greater than or equal to 70 degrees but snow/ice flag set up to 85 degrees)	2			unitless	No		2 bit(s)	Name Value	Name Value Solar Zenith Angle < 70 Degrees 0 70 degrees <= Solar Zenith Angle <= 85 degrees 1 Solar Zenith Angle > 85 2
Spare	4			unitless	No		4 bit(s)	Name Value	Name Value

Confidence — 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
QST IP Pixel Confidence (Pixel level confidence in percent for each of the Surface Types). Quality flowed down from QST IP Surface Type Confidence. Confidence associated with IGBP Surface Type Classification. Values 0 – 100 = percent confidence. 247 = Surface Type defined by NIMA Vector Map (VMap) Level 0	0	0	247	percent	No		unsigned 8-bit char	Name Value NA_UINT8_FILL 255 MISS_UINT8_FILL 254 ONBOARD_PT_UINT8_FILL 253 ONGROUND_PT_UINT8_FILL 252 ERR_UINT8_FILL 251 ELLIPSOID_UINT8_FILL 250 VDNE_UINT8_FILL 249 SOUB_UINT8_FILL 248	Name Value

Table 5.4.6.2-3, VIIRS Surface Type EDR Product Profile – Factors

Name	Data Size	Dimensions
VegetationFractionFactors	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			unitless	No		32-bit floating point	Name Value	Name Value

5.4.6.3 VIIRS Surface Type EDR HDF5 Details

Figure 5.4.6.3-1, VIIRS Surface Type EDR UML Diagram, provides details on the contents and data types of the Surface Type EDR product. This UML provides details at the product level detail only. In addition to this UML, refer to the CDFCB-X, Volume IV, Part 1, D34862-04-01, Figure 1.2.1-1, Figure 1.2.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

VIIRS-ST-EDR
+SurfaceType : H5T_NATIVE_UCHAR +VegetationFraction : H5T_NATIVE_UCHAR +QF1_VIIRSSTEDR : H5T_NATIVE_UCHAR +QF2_VIIRSSTEDR : H5T_NATIVE_UCHAR +Confidence : H5T_NATIVE_UCHAR +VegetationFractionFactors : H5T_NATIVE_FLOAT

Figure 5.4.6.3-1, VIIRS Surface Type EDR HDF5 UML Diagram

5.4.6.4 VIIRS Surface Type EDR HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Surface Type EDR are listed in the CDFCB-X Volume V – Metadata, D34862-05

. 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 5.4.6.4-1, VIIRS Surface Type EDR N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level 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 Surface Type EDR.

Table 5.4.6.4-1, VIIRS Surface Type EDR N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Notes**
Surface Type EDR Summary Quality	0 – 100	Percent of pixels not classified as snow or fire within the current granule with high quality	
Surface Type EDR Exclusion Summary	0 – 100	Percent of pixels with one or more exclusion criteria flags	

5.4.6.5 VIIRS Surface Type EDR Geolocation Details

VIIRS Surface Type EDR is produced on the VIIRS Moderate Resolution Geolocation – Terrain Corrected. See the CDFCB-X, Volume IV, Part 1, D34862-04-01, Section 4.9.5, VIIRS Moderate Resolution Geolocation – Terrain Corrected for details.

5.4.7 VIIRS Vegetation Index

Data Mnemonic	EDRE-VRVI-C0030 (Official) EDRE-VRVI-C0031 (Substitute)
Description/ Purpose	Normalized Difference Vegetation Index (NDVI) - Top of the Atmosphere (TOA) is most directly related to absorption of photosynthetically active radiation, but is often correlated with biomass or primary productivity. Red spectral measurements are sensitive to the chlorophyll content of vegetation and the near IR to the mesophyll structure of leaves. The normalized ratio (IR-Red)/(IR+ Red) has a close relationship with the photosynthetic capacity of specific vegetation types. NDVI is defined as follows: $NDVI = (I2_{TOA} – I1_{TOA}) / (I2_{TOA} + I1_{TOA})$ Spectral bands I1 and I2 are 600 - 680 nm and 845.5 - 884.5 nm respectively. TOA subscripts indicate that the values used are TOA reflectance in the respective bands. The Vegetation Index EDR also contains a Top of the Canopy (TOC) Enhanced Vegetation Index (EVI) which is defined as $EVI = (1 + L) * [(r_{NIR} – r_{Red}) / (r_{NIR} + C_1 r_{Red} – C_2 r_{Blue} + L)]$ Where L is a constant to adjust for soil moisture background and C_1 and C_2 are constants derived from minimizing feedback and errors from soil and atmospheric effects. For VIIRS, $C_1 = 6$, $C_2 = 7.5$, and L=1. r_{NIR} is the I2 Band reflectance at 865nm r_{Red} is the I1 Band reflectance at 640nm r_{Blue} is the M3 Band reflectance at 488nm The M3 band has twice the cell size as the I1 and I2 bands, so its value is applied to the 4 horizontal cells. Sensors: VIIRS Effectivity: NPP and NPOESS
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.
File Size	Estimated Granule Size: 65.6 MiB This granule size includes VIIRS Vegetation Index related fields and quality flags only. Geolocation and metadata attributes are not included. Additional size added by HDF5 packaging is also not included.
File Format Type	HDF5

Data Content and Data Format	See Section 5.4.7.1, VIIRS Vegetation Index Data Content Summary See Section 5.4.7.2, VIIRS Vegetation Index Product Profile See Section 5.4.7.3, VIIRS Vegetation Index HDF5 Details See Section 5.4.7.4, VIIRS Vegetation Index HDF5 Metadata Details See Section 5.4.7.5, VIIRS Vegetation Index Geolocation Details

5.4.7.1 VIIRS Vegetation Index Data Content Summary

Table 5.4.7.1-1, VIIRS Vegetation Index Data Content Summary

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

5.4.7.2 VIIRS Vegetation Index Product Profile

Table 5.4.7.2-1, VIIRS Vegetation Index Product Profile

Fields												
Name	**Data Size**	**Dimensions**										
TOA_NDVI	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		AlongTrack	Yes	No	1536	1536						
		CrossTrack	No	No	6400	6400						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Normalized Difference Vegetation Index - Top of Atmosphere	0	-1.00	1.00	unitless	Yes	TOA_NDVI_Factors	unsigned 16-bit integer	**Name**	**Value**	**Name** **Value**
										NA_UINT16_FILL	65535	
										MISS_UINT16_FILL	65534	
										ONBOARD_PT_UINT16_FILL	65533	
										ONGROUND_PT_UINT16_FILL	65532	
										ERR_UINT16_FILL	65531	
										ELINT_UINT16_FILL	65530	
										VDNE_UINT16_FILL	65529	
										SOUB_UINT16_FILL	65528	
TOC_EVI	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		AlongTrack	Yes	No	1536	1536						
		CrossTrack	No	No	6400	6400						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Enhanced Vegetation Index - Top of Canopy	0	-1.00	4.00	unitless	Yes	TOC_EVI_Factors	unsigned 16-bit integer	**Name**	**Value**	**Name** **Value**
										NA_UINT16_FILL	65535	
										MISS_UINT16_FILL	65534	
										ONBOARD_PT_UINT16_FILL	65533	
										ONGROUND_PT_UINT16_FILL	65532	
										ERR_UINT16_FILL	65531	
										ELINT_UINT16_FILL	65530	
										VDNE_UINT16_FILL	65529	
										SOUB_UINT16_FILL	65528	

Table 5.4.7.2-2, VIIRS Vegetation Index Product Profile – Quality Flags

Name	Data Size	Dimensions
QF1_VIIRSVIEDR	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	
								Name	Value	Name	Value
Overall NDVI Quality	0			unitless	No		1 bit(s)			Low	0
										High	1
Overall EVI Quality	1			unitless	No		1 bit(s)			Low	0
										High	1
I1 TOA Reflectance is NOT available	2			unitless	No		1 bit(s)			False	0
										True	1
I2 TOA Reflectance is NOT available	3			unitless	No		1 bit(s)			False	0
										True	1
I1 Surface Reflectance is NOT available	4			unitless	No		1 bit(s)			False	0
										True	1
I2 Surface Reflectance is NOT available	5			unitless	No		1 bit(s)			False	0
										True	1
M3 Surface Reflectance is NOT available	6			unitless	No		1 bit(s)			False	0
										True	1
EVI Range is out of range (EVI < -1.0 or EVI > 4.0)	7			unitless	No		1 bit(s)			False	0
										True	1

QF2_VIIRSVIEDR	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	Unscaled Valid	Unscaled Valid	Measurement	Scaled	Scale	Data	Fill Values	Legend Entries

			Offset	Range Min	Range Max	Units		Factor Name	Type				
		Land/Water	0			unitless	No		3 bit(s)	Name	Value	Name	Value
												Land & Desert	0
												Land/No Desert	1
												Inland Water	2
												Sea Water	3
												Coastal	5
		Cloud Confidence	3			unitless	No		2 bit(s)	Name	Value	Name	Value
												Confidently Clear	0
												Probably Clear	1
												Probably Cloudy	2
												Confidently Cloudy	3
		Sun Glint in pixel (as indicated in the VIIRS Cloud Mask)	5			unitless	No		2 bit(s)	Name	Value	Name	Value
												None	0
												Geometry Based	1
												Wind-Speed Based	2
												Geometry & Wind	3
		Thin Cirrus detected in pixel (from VIIRS Cloud Mask)	7			unitless	No		1 bit(s)	Name	Value	Name	Value
												False	0
												True	1

QF3_VIIRSVIEDR 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	
Degradation Condition: Solar Zenith Angle within Range (65 Deg <= Solar Zenith Angle <= 85 Deg)	0			unitless	No		1 bit(s)	Name	Value	Name	Value
										False	0
										True	1
Exclusion: AOT > 1.0 (AOT in horizontal cell > 1.0 on the slant path (AOT @550nm))	1			unitless	No		1 bit(s)	Name	Value	Name	Value
										False	0

											True	1
		Exclusion: Solar Zenith Angle > 85 Deg	2			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**
											False	0
											True	1
		Spare	3			unitless	No		5 bit(s)	**Name** **Value**	**Name**	**Value**

Table 5.4.7.2-3, VIIRS Vegetation Index Product Profile – Factors

Fields											
Name	**Data Size**	**Dimensions**									
TOA_NDVI_Factors	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**					
		Granule	Yes	No	2	2					
		Datum									
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**
		Scale = First Array Element; Offset = 2nd Array Element	0			unitless	No		32-bit floating point	**Name** **Value**	**Name** **Value**
TOC_EVI_Factors	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**					
		Granule	Yes	No	2	2					
		Datum									
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**
		Scale = First Array Element; Offset = 2nd Array Element	0			unitless	No		32-bit floating point	**Name** **Value**	**Name** **Value**

5.4.7.3 VIIRS Vegetation Index HDF5 Details

Figure 5.4.7.3-1, VIIRS Vegetation Index UML Diagram, provides details on the contents and data types of the Vegetation Index product. This UML provides details at the product level detail only. In addition to this UML, refer to the CDFCB-X, Volume IV, Part 1, D34862-04-01, Figure 1.2.1-1, Figure 1.2.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

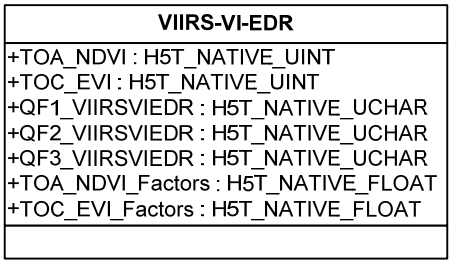

Figure 5.4.7.3-1, VIIRS Vegetation Index HDF5 UML Diagram

5.4.7.4 VIIRS Vegetation Index HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Vegetation Index EDR are listed in the CDFCB-X Volume V – Metadata, D34862-05. 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 5.4.7.4-1, VIIRS Vegetation Index N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level Metadata Values, provides the following items as name/value pairs. The listed name/value pair items in the table are the granule level quality flags for the VIIRS Vegetation Index.

Table 5.4.7.4-1, VIIRS Vegetation Index N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Notes**
EVI Summary Quality	0 – 100	Percent of cells with high quality	

N_Quality_Summary			
Name	**Value**	**Description**	**Notes**
NDVI Summary Quality	0 – 100	Percent of cells with high quality	
EVI Exclusion Summary	0 – 100	Percent of pixels with one or more EVI exclusion criteria flags	
NDVI Exclusion Summary	0 – 100	Percent of pixels with one or more NDVI exclusion criteria flags	
No Land in Granule	0	Land in Granule	
	1	No Land in Granule	

5.4.7.5 VIIRS Vegetation Index Geolocation Details

VIIRS Vegetation Index is produced on the VIIRS Imagery Resolution Geolocation – Terrain Corrected. See the CDFCB-X, Volume IV, Part 1, D34862-04-01, Section 4.9.6, VIIRS Imagery Resolution Geolocation – Terrain Corrected for details.

5.5 Ocean/Water Environmental Data Records

5.5.1 Sea Surface Temperature

Sea Surface Temperature (SST) is defined as a measurement of the temperature of the surface layer (skin) and upper 1 meter (bulk) of ocean water.

A horizontal cell is considered clear for this EDR if the cloud mask indicates “confidently clear” for that cell. Cloud cover for a horizontal cell is considered to be negligible if the following criteria are met:

- The cloud mask indicates “confidently clear” for a horizontal cell and the cells adjacent to it.
- The “thin cirrus” detection flag is not set for that horizontal cell.

The skin temperature is retrieved directly from the satellite radiances and the bulk temperature is derived from the skin.

Sensors	VIIRS
Effectivity	NPP/NPOESS
EDR Contents	For each pixel, the SST EDR contains: Skin temperature Bulk temperature Quality Flags Scale/Offset Factors

5.5.1.1 DELETED

5.5.1.2 VIIRS Sea Surface Temperature

Data Mnemonic	EDRE-SSTE-C1030 (Official) EDRE-SSTE-C1031 (Substitute)
Description/ Purpose	The overall scientific objective of the VIIRS SST retrievals is to provide improved operational measurements of both skin and bulk SST fields by using statistical methods. The VIIRS SST EDR requires a 0.1 K measurement accuracy and a 0.5 K measurement uncertainty. Sea Surface Temperature (SST) is defined as a measurement of the temperature of the surface layer (skin) and upper 1 meter (bulk) of ocean water. The skin temperature is retrieved directly from the satellite radiances and the bulk temperature is derived from the skin. Sensors: VIIRS Effectivity: NPP and NPOESS
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.
File Size	Estimated Granule Size: 18.8 MiB This granule size includes VIIRS Sea Surface Temperature EDR related fields and quality flags only. Geolocation and metadata attributes are not included. Additional size added by HDF5 packaging is also not included.
File Format Type	HDF5
Data Content and Data Format	See Section 5.5.1.2.1, VIIRS Sea Surface Temperature EDR Data Content Summary See Section 5.5.1.2.2, VIIRS Sea Surface Temperature EDR Product Profile See Section 5.5.1.2.3, VIIRS Sea Surface Temperature EDR HDF5 Details See Section 5.5.1.2.4, VIIRS Sea Surface Temperature EDR HDF5 Metadata Details See Section 5.5.1.2.5, VIIRS Sea Surface Temperature EDR Geolocation Details

5.5.1.2.1 VIIRS Sea Surface Temperature EDR Data Content Summary

Table 5.5.1.2.1-1, VIIRS Sea Surface Temperature EDR Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
SkinSST	Sea Surface Skin Temperature	unsigned 16-bit integer	[N*768, 3200]	[768, 3200]	kelvin
BulkSST	Sea Surface Bulk Temperature	unsigned 16-bit integer	[N*768, 3200]	[768, 3200]	kelvin
QF1_VIIRSSSTEDR	Pixel level Quality Flags	unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF2_VIIRSSSTEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF3_VIIRSSSTEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF4_VIIRSSSTEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
SkinSSTFactors	Scale = First Array Element; Offset = 2nd Array Element	32-bit floating point	[N*2]	[2]	scale = unitless; offset = kelvin
BulkSSTFactors	Scale = First Array Element; Offset = 2nd Array Element	32-bit floating point	[N*2]	[2]	scale = unitless; offset = kelvin

5.5.1.2.2 VIIRS Sea Surface Temperature EDR Product Profile

Table 5.5.1.2.2-1, VIIRS Sea Surface Temperature EDR Product Profile

Fields												
Name	**Data Size**	**Dimensions**										
SkinSST	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**
		Sea Surface Skin Temperature	0	265.00	320.00	kelvin	Yes	SkinSSTFactors	unsigned 16-bit integer	**Name**	**Value**	**Name** **Value**
										NA_UINT16_FILL	65535	
										MISS_UINT16_FILL	65534	
										ONBOARD_PT_UINT16_FILL	65533	
										ONGROUND_PT_UINT16_FILL	65532	
										ERR_UINT16_FILL	65531	
										ELINT_UINT16_FILL	65530	
										VDNE_UINT16_FILL	65529	
										SOUB_UINT16_FILL	65528	
BulkSST	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**
		Sea Surface Bulk Temperature	0	265.00	320.00	kelvin	Yes	BulkSSTFactors	unsigned 16-bit integer	**Name**	**Value**	**Name** **Value**
										NA_UINT16_FILL	65535	
										MISS_UINT16_FILL	65534	
										ONBOARD_PT_UINT16_FILL	65533	
										ONGROUND_PT_UINT16_FILL	65532	
										ERR_UINT16_FILL	65531	
										ELINT_UINT16_FILL	65530	
										VDNE_UINT16_FILL	65529	
										SOUB_UINT16_FILL	65528	

Table 5.5.1.2.2-2, VIIRS Sea Surface Temperature EDR Product Profile – Quality Flags

Fields

Name	Data Size	Dimensions
QF1_VIIRSSSTEDR	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
Skin SST Quality (Indicates the quality of the pixel level retrieval)	0			unitless	No		2 bit(s)	Name / Value	Name / Value: Not Retrieved 0; Excluded 1; Degraded 2; High Quality 3
Bulk SST Quality (Indicates the quality of the pixel level retrieval)	2			unitless	No		2 bit(s)	Name / Value	Name / Value: Not Retrieved 0; Excluded 1; Degraded 2; High Quality 3
SST State	4			unitless	No		2 bit(s)	Name / Value	Name / Value: Dry/None 0; Moist 1; Average 2
Algorithm	6			unitless	No		1 bit(s)	Name / Value	Name / Value: Non-linear Split Window 0; Triple Window 1
Day/Night	7			unitless	No		1 bit(s)	Name / Value	Name / Value: Night 0; Day 1

QF2_VIIRSSSTEDR	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	Unscaled Valid Range	Measurement Units	Scaled	Scale Factor	Data Type	Fill Values	Legend Entries

This document has been identified per the NPOESS Common Data Format Control Book – External Volume 5 Metadata, D34862-05, Appendix B as a document to be provided to the NOAA Comprehensive Large Array-data Stewardship System (CLASS) via the delivery of NPOESS Document Release Packages to CLASS.

				Min	Max			Name			
		SST not retrieved due to non-availability of M15 or M16	0			unitless	No		1 bit(s)	Name Value	Name Value Both Available 0 At Least One Not Available 1
		Single split window algorithm used due to non-availability of M12	1			unitless	No		1 bit(s)	Name Value	Name Value Both Available 0 At Least One Not Available 1
		Cloud Confidence	2			unitless	No		2 bit(s)	Name Value	Name Value Confidently Clear 0 Probably Clear 1 Probably Cloudy 2 Confidently Cloudy 3
		Cloud Adjacency Cloud Confidence Value	4			unitless	No		2 bit(s)	Name Value	Name Value Confidently Clear 0 Probably Clear 1 Probably Cloudy 2 Confidently Cloudy 3
		Thin Cirrus detected in pixel	6			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		Ice Concentration Threshold Exceeded (SST not retrieved due to ice concentration exceeding threshold in System Spec)	7			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
QF3_VIIRSSSTEDR	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
Sun Glint present in pixel	0			unitless	No		1 bit(s)	Name Value	Name Value False 0

This document has been identified per the NPOESS Common Data Format Control Book – External Volume 5 Metadata, D34862-05, Appendix B as a document to be provided to the NOAA Comprehensive Large Array-data Stewardship System (CLASS) via the delivery of NPOESS Document Release Packages to CLASS.

											True	1
		Exclusion: AOT > 1.0 (AOT in horizontal cell > 1.0 on the slant path (AOT @550nm))	1			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**
											False	0
											True	1
		Degradation: AOT > 0.6 (AOT in horizontal cell > 0.6 on the slant path (AOT @550nm))	2			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**
											False	0
											True	1
		Exclusion: No Ocean in pixel	3			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**
											False	0
											True	1
		Degradation - Horizontal Cell Size > 1.3km (HCS > 1.3 km, swath width > 1700 km, Sensor Zenith Angle > 53.0 degrees)	4			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**
											False	0
											True	1
		Sensor Zenith Angle > 40 Degrees (Pixel is not within 40 degrees of Nadir and therefore is not of high quality)	5			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**
											False	0
											True	1
		Skin SST outside of validation range	6			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**
											False	0
											True	1
		Bulk SST outside of validation range	7			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**
											False	0
											True	1
QF4_VIIRSSSTEDR	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**
Skin SST Degraded, T > 305K	0			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value**
									False 0
									True 1
Bulk SST Degraded, T > 305K	1			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value**
									False 0
									True 1
Spare	2			unitless	No		6 bit(s)	**Name** **Value**	**Name** **Value**

Table 5.5.1.2.2-3, VIIRS Sea Surface Temperature EDR Product Profile – Factors

SkinSSTFactors	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			scale = unitless; offset = kelvin	No		32-bit floating point	**Name** **Value**	**Name** **Value**
BulkSSTFactors	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			scale = unitless; offset = kelvin	No		32-bit floating point	**Name** **Value**	**Name** **Value**

5.5.1.2.3 VIIRS Sea Surface Temperature EDR HDF5 Details

Figure 5.5.1.2.3-1, VIIRS Sea Surface Temperature EDR UML Diagram, provides details on the contents and data types of the Sea Surface Temperature EDR product. This UML provides details at the product level detail only. In addition to this UML, refer to the CDFCB-X, Volume IV, Part 1, D34862-04-01, Figure 1.2.1-1, Figure 1.2.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

VIIRS-SST-EDR
+SkinSST : H5T_NATIVE_UINT +BulkSST : H5T_NATIVE_UINT +QF1_VIIRSSSTEDR : H5T_NATIVE_UCHAR +QF2_VIIRSSSTEDR : H5T_NATIVE_UCHAR +QF3_VIIRSSSTEDR : H5T_NATIVE_UCHAR +QF4_VIIRSSSTEDR : H5T_NATIVE_UCHAR +SkinSSTFactors : H5T_NATIVE_FLOAT +BulkSSTFactors : H5T_NATIVE_FLOAT

Figure 5.5.1.2.3-1, VIIRS Sea Surface Temperature EDR HDF5 UML Diagram

5.5.1.2.4 VIIRS Sea Surface Temperature EDR HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Sea Surface Temperature EDR are listed in the CDFCB-X Volume V – Metadata, D34862-05. 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 5.5.1.2.4-1, VIIRS Sea Surface Temperature EDR N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level 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 Sea Surface Temperature EDR.

Table 5.5.1.2.4-1, VIIRS Sea Surface Temperature EDR N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Notes**
Skin Summary Quality	0 – 100	Percent of pixels with High Quality Skin SST retrievals	
Bulk Summary Quality	0 – 100	Percent of pixels with High Quality Bulk SST retrievals	
Skin Exclusion Summary	0 – 100	Percent of pixels with one or more Skin SST exclusion criteria flags	
Bulk Exclusion Summary	0 – 100	Percent of pixels with one or more Bulk SST exclusion criteria flags	
Skin Degraded Summary	0 – 100	Percent of pixels with Skin SST Degraded Quality	
Bulk Degraded Summary	0 – 100	Percent of pixels with Bulk SST Degraded Quality	
Skin Summary Range Check	0 – 100	Percent of Skin SST retrievals excluded due to Skin SST value being outside of the range required by the System Spec.	
Bulk Summary Range Check	0 – 100	Percent of Bulk SST retrievals excluded due to Skin SST value being outside of the range required by the System Spec.	

5.5.1.2.5 VIIRS Sea Surface Temperature EDR Geolocation Details

VIIRS Sea Surface Temperature is produced on the VIIRS Moderate Resolution Geolocation – Terrain Corrected. See the CDFCB-X, Volume IV, Part 1, D34862-04-01, Section 4.9.5, VIIRS Moderate Resolution Geolocation – Terrain Corrected for details.

5.5.2 DELETED

5.5.3 Ice Surface Temperature

Clear for the Ice Surface Temperature EDR is when the cloud mask classifies a particular horizontal cell as “confidently clear.”

Sensors	VIIRS
Effectivity	NPP/NPOESS
EDR Contents	For each pixel, the Ice Surface Temperature EDR contains: Ice surface temperature Quality Flags

5.5.3.1 DELETED

This document has been identified per the NPOESS Common Data Format Control Book – External Volume 5 Metadata, D34862-05, Appendix B as a document to be provided to the NOAA Comprehensive Large Array-data Stewardship System (CLASS) via the delivery of NPOESS Document Release Packages to CLASS.

5.5.3.2 VIIRS Ice Surface Temperature EDR

Data Mnemonic	EDRE-ICST-C1030 (Official) EDRE-ICST-C1031 (Substitute)
Description/ Purpose	The Ice Surface Temperature EDR using VIIRS data. The overall scientific objective of the VIIRS IST retrievals is to provide improved measures of global and regional IST fields. The VIIRS IST EDR requires a 0.5 K measurement uncertainty. The requirements are met, provided accurate cloud/ice discrimination is available.
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.
File Size	Estimated Granule Size: 11.7 MiB This granule size includes VIIRS Ice Surface Temperature EDR related fields and quality flags only. Geolocation and metadata attributes are not included. Additional size added by HDF5 packaging is also not included.
File Format Type	HDF5
Data Content and Data Format	See Section 5.5.3.2.1, VIIRS Ice Surface Temperature EDR Data Content Summary See Section 5.5.3.2.2, VIIRS Ice Surface Temperature EDR Product Profile See Section 5.5.3.2.3, VIIRS Ice Surface Temperature EDR HDF5 Details See Section 5.5.3.2.4, VIIRS Ice Surface Temperature EDR HDF5 Metadata Details See Section 5.5.3.2.5, VIIRS Ice Surface Temperature EDR Geolocation Details

5.5.3.2.1 VIIRS Ice Surface Temperature EDR Data Content Summary

Table 5.5.3.2.1-1, VIIRS Ice Surface Temperature EDR Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
IceSurfaceTemperature	Ice Surface	unsigned 16-bit	[N*768,	[768, 3200]	kelvin

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
	Temperature	integer	3200]		
QF1_VIIRSISTEDR	Pixel level quality flags	unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF2_VIIRSISTEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF3_VIIRSISTEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
ISTFactors	Scale = First Array Element; Offset = 2nd Array Element	32-bit floating point	[N*2]	[2]	scale = unitless; offset = kelvin

5.5.3.2.2 VIIRS Ice Surface Temperature EDR Product Profile

Table 5.5.3.2.2-1, VIIRS Ice Surface Temperature EDR Product Profile

Fields																
Name	**Data Size**	**Dimensions**														
IceSurfaceTemperature	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**				
		Ice Surface Temperature	0	183.20	275.00	kelvin	Yes	ISTFactors	unsigned 16-bit integer	**Name**	**Value**	**Name**	**Value**			
										NA_UINT16_FILL	65535					
										MISS_UINT16_FILL	65534					
										ONBOARD_PT_UINT16_FILL	65533					
										ONGROUND_PT_UINT16_FILL	65532					
										ERR_UINT16_FILL	65531					
										ELINT_UINT16_FILL	65530					
										VDNE_UINT16_FILL	65529					
										SOUB_UINT16_FILL	65528					

Table 5.5.3.2.2-2, VIIRS Ice Surface Temperature EDR Product Profile – Quality Flags

Fields

Name	Data Size	Dimensions
QF1_VIIRSISTEDR	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
IST Quality (Indicates the quality of the pixel level retrieval)	0			unitless	No		2 bit(s)	Name / Value	Name / Value: High 0; Medium 1; Low 2; No Retrieval 3
Algorithm (Indicates which algorithm branch was implemented)	2			unitless	No		1 bit(s)	Name / Value	Name / Value: 2-Band Split Window 0; Single Band (12-micrometer) Retrieval 1
Day/Night	3			unitless	No		1 bit(s)	Name / Value	Name / Value: Night (Solar Zenith Angle > 85 Degrees) 0; Day (Solar Zenith Angle <= 85 degrees) 1
Band M15 Brightness Temperature is out of System Spec Range (BT(M15) <= 190K or BT(M15) >= 343K)	4			unitless	No		1 bit(s)	Name / Value	Name / Value: False 0; True 1
Band M16 Brightness Temperature is out of System Spec Range (BT(M16) <= 190K or BT(M16) >= 340K)	5			unitless	No		1 bit(s)	Name / Value	Name / Value: False 0; True 1
Fire detected in pixel	6			unitless	No		1 bit(s)	Name / Value	Name / Value: False 0; True 1
Pixel is outside of Ice Coverage Zone (Ice Coverage Zone is defined to be:	7			unitless	No		1 bit(s)	Name / Value	Name / Value: False 0

		Latitude is North of 36N or Latitude is South of 50S)									True	1

QF2_VIIRSISTEDR 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	
								Name	Value	Name	Value
Ice Fraction	0			unitless	No		2 bit(s)			Ice Fraction = 1.00	0
										0.95 <= Ice Fraction < 1.00	1
										0.00 < Ice Fraction < 0.95	2
										Ice Fraction = 0.00	3
Cloud Confidence Indicator	2			unitless	No		2 bit(s)			Confidently Clear	0
										Probably Clear	1
										Probably Cloudy	2
										Confidently Cloudy	3
Adjacent Pixel Cloud Confidence Indicator	4			unitless	No		2 bit(s)			Confidently Clear	0
										Probably Clear	1
										Probably Cloudy	2
										Confidently Cloudy	3
Exclusion - Thin Cirrus Detected	6			unitless	No		1 bit(s)			False	0
										True	1
Spare	7			unitless	No		1 bit(s)				

QF3_VIIRSISTEDR 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	Unscaled Valid Range	Measurement Units	Scaled	Scale Factor	Data Type	Fill Values	Legend Entries

				Min	Max			Name					
		Exclusion - Land/Water Background (Identifies the type of Earth surface that lies along the instrument's line of sight. All land types except Sea Water are excluded from processing)	0			unitless	No		3 bit(s)	Name Value	Name	Value	
											Land and Desert	0	
											Land/No Desert	1	
											Inland Water	2	
											Sea Water	3	
											Coastal	5	
											Invalid Land/Water	7	
		Snow or Ice detected in pixel	3			unitless	No		1 bit(s)	Name Value	Name	Value	
											False	0	
											True	1	
		Shadow detected in pixel	4			unitless	No		1 bit(s)	Name Value	Name	Value	
											False	0	
											True	1	
		Exclusion: AOT > 1.0 (AOT in horizontal cell > 1.0 on the slant path (AOT @550nm))	5			unitless	No		1 bit(s)	Name Value	Name	Value	
											False	0	
											True	1	
		Ice Surface Temperature is Out of the System Spec Validated Range. (IST < 213K or IST > 275K)	6			unitless	No		1 bit(s)	Name Value	Name	Value	
											False	0	
											True	1	
		Spare	7			unitless	No		1 bit(s)	Name Value	Name	Value	

Table 5.5.3.2.2-3, VIIRS Ice Surface Temperature EDR Product Profile – Factors

Fields											
Name	**Data Size**	**Dimensions**									
ISTFactors	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			scale = unitless; offset = kelvin	No		32-bit floating point	**Name** **Value**	**Name** **Value**

5.5.3.2.3 VIIRS Ice Surface Temperature EDR HDF5 Details

Figure 5.5.3.2.3-1, VIIRS Ice Surface Temperature EDR UML Diagram, provides details on the contents and data types of the Ice Surface Temperature EDR product. This UML provides details at the product level detail only. In addition to this UML, refer to the CDFCB-X, Volume IV, Part 1, D34862-04-01, Figure 1.2.1-1, Figure 1.2.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

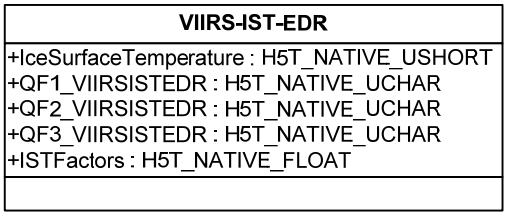

Figure 5.5.3.2.3-1, VIIRS Ice Surface Temperature EDR HDF5 UML Diagram

5.5.3.2.4 VIIRS Ice Surface Temperature EDR HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Ice Surface Temperature EDR are listed in the CDFCB-X Volume V – Metadata, D34862-05. 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 5.5.3.2.4-1, VIIRS Ice Surface Temperature EDR N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level 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 Ice Surface Temperature EDR.

Table 5.5.3.2.4-1, VIIRS Ice Surface Temperature EDR N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Notes**
Ice Surface Temperature EDR Summary Quality	0 – 100	Percent of pixels within granule with high quality of retrieval	

N_Quality_Summary			
Name	**Value**	**Description**	**Notes**
Exclusion Summary	0 – 100	Percent of pixels with excluded conditions	
Summary Range Check	0 – 100	Percent of retrieved pixels outside of expected range (213K to 275K)	
SDR Input Data Quality	0 – 100	Percent of pixels with high quality input values of brightness temperature in VIIRS SDR	
Ice Concentration IP Input Data Quality	0 – 100	Percent of pixels with high quality input values for Ice Concentration IP	
VCM Input Data Quality	0 – 100	Percent of pixels with high quality input values for the VIIRS Cloud Mask	
AOT Input Data Quality	0 – 100	Percent of pixels with high quality input values for AOT (valid for day only)	
No Ocean Coverage	0	At least one ocean pixel in granule	
	1	No Ocean pixels in granule	
No Land Coverage	0	At least one land pixel in granule	
	1	No land pixels in granule	

5.5.3.2.5 VIIRS Ice Surface Temperature EDR Geolocation Details

VIIRS Ice Surface Temperature is produced on the VIIRS Moderate Resolution Geolocation – Terrain Corrected. See the CDFCB-X, Volume IV, Part 1, D34862-04-01, Section 4.9.5, VIIRS Moderate Resolution Geolocation – Terrain Corrected for details.

5.5.4 Net Heat Flux

Data Mnemonic	EDRE-VNHF-C0030 (Official) EDRE-VNHF-C0031 (Substitute)
Description/ Purpose	Net heat flux refers to net surface flux over oceans (including ice covered). Components are longwave and shortwave radiation, latent heat flux and sensible heat flux. Note: The term ‘water’ is synonymous with ‘ocean water’ in the description fields for this product. The term ‘ice’ is synonymous with ‘ocean ice’. Net Heat Flux values are not retrieved over large inland bodies of water/ice. Sensors: VIIRS Effectivity: NPP and NPOESS
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.
File Size	Estimated Granule Size: 0.7 MiB This granule size includes Net Heat Flux related fields and quality flags only. Geolocation and metadata attributes are not included. Additional size added by HDF5 packaging is also not included. Geolocation Estimated Granule Size: 0.39 MiB
File Format Type	HDF5

Data Content and Data Format	For each aggregated area, the Net Heat Flux EDR contains: Net Heat Flux Latent and Sensible Heat Fluxes Longwave and Shortwave Fluxes Number of pixels in cell (total, clear, water, and ice) Quality Flags Associated Geolocation fields for this EDR are also listed Note: The Net Heat Flux EDR implements a special set fill values in order to avoid conflict with the valid range of values. See Section 5.5.4.1, Net Heat Flux Data Content Summary See Section 5.5.4.2 Net Heat Flux Product Profile See Section 5.5.4.3, Net Heat Flux HDF5 Details See Section 5.5.4.4 Net Heat Flux HDF5 Metadata See Section 5.5.4.5, Net Heat Flux Geolocation Details See Section 5.5.4.6, Net Heat Flux Geolocation Product Profile See Section 5.5.4.7, Net Heat Flux Geolocation HDF5 Details See Section 5.5.4.8, Net Heat Flux Geolocation HDF5 Metadata Details

5.5.4.1 Net Heat Flux Data Content Summary

Table 5.5.4.1-1, Net Heat Flux Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
NetHeatFlux_Total	Total net heat flux (positive = transfer from surface to atmosphere) from water and ice surfaces	32-bit floating point	[N*48, 254]	[48, 254]	W/m^2
NetHeatFlux_Water	Total net heat flux (positive = transfer from surface to atmosphere) from water surfaces	32-bit floating point	[N*48, 254]	[48, 254]	W/m^2
NetHeatFlux_Ice	Total net heat flux (positive = transfer from surface to atmosphere) from ice surfaces.	32-bit floating point	[N*48, 254]	[48, 254]	W/m^2
LatentHeatFlux_Water	Latent heat flux (positive = transfer from surface to atmosphere) from water surfaces	32-bit floating point	[N*48, 254]	[48, 254]	W/m^2
LatentHeatFlux_Ice	Latent heat flux (positive = transfer from surface to atmosphere) from ice surfaces	32-bit floating point	[N*48, 254]	[48, 254]	W/m^2
SensibleHeatFlux_Water	Sensible heat flux (positive = transfer from surface to atmosphere) from water	32-bit floating point	[N*48, 254]	[48, 254]	W/m^2

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
	surfaces				
SensibleHeatFlux_Ice	Sensible heat flux (positive = transfer from surface to atmosphere) from ice surfaces	32-bit floating point	[N*48, 254]	[48, 254]	W/m^2
LW_Flux_Water	Longwave flux (positive = transfer from surface to atmosphere) from water surfaces	32-bit floating point	[N*48, 254]	[48, 254]	W/m^2
LW_Flux_Ice	Longwave flux (positive = transfer from surface to atmosphere) from ice surfaces	32-bit floating point	[N*48, 254]	[48, 254]	W/m^2
SW_Flux_Water	Shortwave flux (positive = transfer from surface to atmosphere) from water surfaces	32-bit floating point	[N*48, 254]	[48, 254]	W/m^2
SW_Flux_Ice	Shortwave flux (positive = transfer from surface to atmosphere) from ice surfaces	32-bit floating point	[N*48, 254]	[48, 254]	W/m^2
Total_Number_Of_Pixels_In_Cell	Total number of pixels included in the aggregated cell (nTotal)	16-bit integer	[N*48, 254]	[48, 254]	pixels
Number_Of_Clear_Pixels_In_Cell	Number of clear pixels included in the aggregated cell	16-bit integer	[N*48, 254]	[48, 254]	pixels

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
	(nClear)				
Number_Of_Water_Pixels_In_Cell	Number of pixels over water included in the aggregated cell (nWater)	16-bit integer	[N*48, 254]	[48, 254]	pixels
Number_Of_Ice_Pixels_In_Cell	Number of pixels over ice included in the aggregated cell (nIce)	16-bit integer	[N*48, 254]	[48, 254]	pixels
QF1_VIIRSNHFEDR	Net Heat Flux Quality Flags	unsigned 8-bit char	[N*48, 254]	[48, 254]	unitless
QF2_VIIRSNHFEDR		unsigned 8-bit char	[N*48, 254]	[48, 254]	unitless
QF3_VIIRSNHFEDR		unsigned 8-bit char	[N*48, 254]	[48, 254]	unitless
QF4_VIIRSNHFEDR		unsigned 8-bit char	[N*48, 254]	[48, 254]	unitless
QF5_VIIRSNHFEDR		unsigned 8-bit char 8	[N*48, 254]	[48, 254]	unitless

5.5.4.2 Net Heat Flux Product Profile

Table 5.5.4.2-1, Net Heat Flux Product Profile – Flux Values

Fields												
Name	**Data Size**	**Dimensions**										
NetHeatFlux_Total	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		AlongTrack	Yes	No	48	48						
		CrossTrack	No	No	254	254						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Total net heat flux (positive = transfer from surface to atmosphere) from water and ice surfaces	0	-2000	2000	W/m^2	No		32-bit floating point	**Name**	**Value**	**Name** **Value**
										NA_FLOAT32_FILL	-9999.9	
										MISS_FLOAT32_FILL	-9999.8	
										ERR_FLOAT32_FILL	-9999.5	
										ELINT_FLOAT32_FILL	-9999.4	
										VDNE_FLOAT32_FILL	-9999.3	
NetHeatFlux_Water	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		AlongTrack	Yes	No	48	48						
		CrossTrack	No	No	254	254						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Total net heat flux (positive = transfer from surface to atmosphere) from water surfaces	0	-2000	2000	W/m^2	No		32-bit floating point	**Name**	**Value**	**Name** **Value**
										NA_FLOAT32_FILL	-9999.9	
										MISS_FLOAT32_FILL	-9999.8	
										ERR_FLOAT32_FILL	-9999.5	
										ELINT_FLOAT32_FILL	-9999.4	
										VDNE_FLOAT32_FILL	-9999.3	
NetHeatFlux_Ice	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		AlongTrack	Yes	No	48	48						
		CrossTrack	No	No	254	254						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**

					Max							
		Total net heat flux (positive = transfer from surface to atmosphere) from ice surfaces.	0	-2000	2000	W/m^2	No		32-bit floating point	Name / Value NA_FLOAT32_FILL / -9999.9 MISS_FLOAT32_FILL / -9999.8 ERR_FLOAT32_FILL / -9999.5 ELINT_FLOAT32_FILL / -9999.4 VDNE_FLOAT32_FILL / -9999.3	Name / Value

LatentHeatFlux_Water	4byte(s)	Name / Granule Boundary / Dynamic / Min Array Size / Max Array Size AlongTrack / Yes / No / 48 / 48 CrossTrack / No / No / 254 / 254									
		Datum									
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
		Latent heat flux (positive = transfer from surface to atmosphere) from water surfaces	0	-2000	2000	W/m^2	No		32-bit floating point	Name / Value NA_FLOAT32_FILL / -9999.9 MISS_FLOAT32_FILL / -9999.8 ERR_FLOAT32_FILL / -9999.5 ELINT_FLOAT32_FILL / -9999.4 VDNE_FLOAT32_FILL / -9999.3	Name / Value

LatentHeatFlux_Ice	4byte(s)	Name / Granule Boundary / Dynamic / Min Array Size / Max Array Size AlongTrack / Yes / No / 48 / 48 CrossTrack / No / No / 254 / 254									
		Datum									
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
		Latent heat flux (positive = transfer from surface to atmosphere) from ice surfaces	0	-2000	2000	W/m^2	No		32-bit floating point	Name / Value NA_FLOAT32_FILL / -9999.9 MISS_FLOAT32_FILL / -9999.8 ERR_FLOAT32_FILL / -9999.5 ELINT_FLOAT32_FILL / -9999.4 VDNE_FLOAT32_FILL / -9999.3	Name / Value

SensibleHeatFlux_Water	4byte(s)	Name / Granule Boundary / Dynamic / Min Array Size / Max Array Size AlongTrack / Yes / No / 48 / 48 CrossTrack / No / No / 254 / 254									
		Datum									
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

					Max								
		Sensible heat flux (positive = transfer from surface to atmosphere) from water surfaces	0	-2000	2000	W/m^2	No		32-bit floating point	Name / Value NA_FLOAT32_FILL / -9999.9 MISS_FLOAT32_FILL / -9999.8 ERR_FLOAT32_FILL / -9999.5 ELINT_FLOAT32_FILL / -9999.4 VDNE_FLOAT32_FILL / -9999.3	Name / Value	
SensibleHeatFlux_Ice	4byte(s)	Name / Granule Boundary / Dynamic / Min Array Size / Max Array Size AlongTrack / Yes / No / 48 / 48 CrossTrack / No / No / 254 / 254											
		Datum											
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Sensible heat flux (positive = transfer from surface to atmosphere) from ice surfaces	0	-2000	2000	W/m^2	No		32-bit floating point	Name / Value NA_FLOAT32_FILL / -9999.9 MISS_FLOAT32_FILL / -9999.8 ERR_FLOAT32_FILL / -9999.5 ELINT_FLOAT32_FILL / -9999.4 VDNE_FLOAT32_FILL / -9999.3		Name / Value
LW_Flux_Water	4byte(s)	Name / Granule Boundary / Dynamic / Min Array Size / Max Array Size AlongTrack / Yes / No / 48 / 48 CrossTrack / No / No / 254 / 254											
		Datum											
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Longwave flux (positive = transfer from surface to atmosphere) from water surfaces	0	-2000	2000	W/m^2	No		32-bit floating point	Name / Value NA_FLOAT32_FILL / -9999.9 MISS_FLOAT32_FILL / -9999.8 ERR_FLOAT32_FILL / -9999.5 ELINT_FLOAT32_FILL / -9999.4 VDNE_FLOAT32_FILL / -9999.3		Name / Value
LW_Flux_Ice	4byte(s)	Name / Granule Boundary / Dynamic / Min Array Size / Max Array Size AlongTrack / Yes / No / 48 / 48 CrossTrack / No / No / 254 / 254											
		Datum											
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	

					Max							
		Longwave flux (positive = transfer from surface to atmosphere) from ice surfaces	0	-2000	2000	W/m^2	No		32-bit floating point	Name / Value NA_FLOAT32_FILL / -9999.9 MISS_FLOAT32_FILL / -9999.8 ERR_FLOAT32_FILL / -9999.5 ELINT_FLOAT32_FILL / -9999.4 VDNE_FLOAT32_FILL / -9999.3		Name / Value

SW_Flux_Water	4byte(s)	Name / Granule Boundary / Dynamic / Min Array Size / Max Array Size AlongTrack / Yes / No / 48 / 48 CrossTrack / No / No / 254 / 254										
		Datum										
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries
		Shortwave flux (positive = transfer from surface to atmosphere) from water surfaces	0	-2000	2000	W/m^2	No		32-bit floating point	Name / Value NA_FLOAT32_FILL / -9999.9 MISS_FLOAT32_FILL / -9999.8 ERR_FLOAT32_FILL / -9999.5 ELINT_FLOAT32_FILL / -9999.4 VDNE_FLOAT32_FILL / -9999.3		Name / Value

SW_Flux_Ice	4byte(s)	Name / Granule Boundary / Dynamic / Min Array Size / Max Array Size AlongTrack / Yes / No / 48 / 48 CrossTrack / No / No / 254 / 254										
		Datum										
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries
		Shortwave flux (positive = transfer from surface to atmosphere) from ice surfaces	0	-2000	2000	W/m^2	No		32-bit floating point	Name / Value NA_FLOAT32_FILL / -9999.9 MISS_FLOAT32_FILL / -9999.8 ERR_FLOAT32_FILL / -9999.5 ELINT_FLOAT32_FILL / -9999.4 VDNE_FLOAT32_FILL / -9999.3		Name / Value

Total_Number_Of_Pixels_In_Cell	2byte(s)	Name / Granule Boundary / Dynamic / Min Array Size / Max Array Size AlongTrack / Yes / No / 48 / 48 CrossTrack / No / No / 254 / 254										
		Datum										
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries

		Total number of pixels included in the aggregated cell (nTotal)	0			pixels	No		16-bit integer	**Name** / **Value**: NA_INT16_FILL -999; MISS_INT16_FILL -998; ERR_INT16_FILL -995; ELINT_INT16_FILL -994; VDNE_INT16_FILL -993	**Name** / **Value**		
Number_Of_Clear_Pixels_In_Cell	2byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size**: AlongTrack, Yes, No, 48, 48; CrossTrack, No, No, 254, 254											
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Number of clear pixels included in the aggregated cell (nClear)	0			pixels	No		16-bit integer	**Name** / **Value**: NA_INT16_FILL -999; MISS_INT16_FILL -998; ERR_INT16_FILL -995; ELINT_INT16_FILL -994; VDNE_INT16_FILL -993	**Name** / **Value**		
Number_Of_Water_Pixels_In_Cell	2byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size**: AlongTrack, Yes, No, 48, 48; CrossTrack, No, No, 254, 254											
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Number of pixels over water included in the aggregated cell (nWater)	0			pixels	No		16-bit integer	**Name** / **Value**: NA_INT16_FILL -999; MISS_INT16_FILL -998; ERR_INT16_FILL -995; ELINT_INT16_FILL -994; VDNE_INT16_FILL -993	**Name** / **Value**		
Number_Of_Ice_Pixels_In_Cell	2byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size**: AlongTrack, Yes, No, 48, 48; CrossTrack, No, No, 254, 254											
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Number of pixels over ice included in the aggregated cell	0			pixels	No		16-bit integer	**Name** / **Value**: NA_INT16_FILL -999	**Name** / **Value**		

		(nIce)								MISS_INT16_FILL -998 ERR_INT16_FILL -995 ELINT_INT16_FILL -994 VDNE_INT16_FILL -993	

Table 5.5.4.2-2, Net Heat Flux Product Profile – Quality Flags

Name	Data Size	Dimensions
QF1_VIIRSNHFEDR	1byte(s)	

Name	Attribute Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	N_Rows	Yes	No	48	48
CrossTrack	N_Columns	No	No	254	254

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Net Heat Flux Pixel Quality (Indicates quality of retrieved value)	0			unitless	No		2 bit(s)	Name / Value	Name / Value: Good 0; Invalid 1; Out of Range 2; Exclusion 3
Net Heat Flux Over Water Quality (Indicates quality of retrieved value)	2			unitless	No		2 bit(s)	Name / Value	Name / Value: Good 0; Invalid 1; Out of Range 2; Exclusion 3
Net Heat Flux Over Ice Quality (Indicates quality of retrieved value)	4			unitless	No		2 bit(s)	Name / Value	Name / Value: Good 0; Invalid 1; Out of Range 2; Exclusion 3
Latent Heat Flux Over Water Quality (Indicates quality of retrieved value)	6			unitless	No		2 bit(s)	Name / Value	Name / Value: Good 0; Invalid 1; Out of Range 2; Exclusion 3

QF2_VIIRSNHFEDR	1byte(s)	**Name**	**Attribute Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**				
		AlongTrack	N_Rows	Yes	No	48	48				
		CrossTrack	N_Columns	No	No	254	254				
		Datum									
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**
		Latent Heat Flux Over Ice Quality (Indicates quality of retrieved value)	0			unitless	No		2 bit(s)	**Name** **Value**	**Name** **Value** Good 0 Invalid 1 Out of Range 2 Exclusion 3
		Sensible Heat Flux Over Water Quality (Indicates quality of retrieved value)	2			unitless	No		2 bit(s)	**Name** **Value**	**Name** **Value** Good 0 Invalid 1 Out of Range 2 Exclusion 3
		Sensible Heat Flux Over Ice Quality (Indicates quality of retrieved value)	4			unitless	No		2 bit(s)	**Name** **Value**	**Name** **Value** Good 0 Invalid 1 Out of Range 2 Exclusion 3
		Shortwave Flux Over Water Quality (Indicates quality of retrieved value)	6			unitless	No		2 bit(s)	**Name** **Value**	**Name** **Value** Good 0 Invalid 1 Out of Range 2 Exclusion 3
QF3_VIIRSNHFEDR	1byte(s)	**Name**	**Attribute Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**				
		AlongTrack	N_Rows	Yes	No	48	48				
		CrossTrack	N_Columns	No	No	254	254				
		Datum									
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**

		Shortwave Flux Over Ice Quality (Indicates quality of retrieved value)	0			unitless	No		2 bit(s)	**Name** / **Value**	**Name**	**Value**	
											Good	0	
											Invalid	1	
											Out of Range	2	
											Exclusion	3	
		Longwave Flux Over Water Quality (Indicates quality of retrieved value)	2			unitless	No		2 bit(s)	**Name** / **Value**	**Name**	**Value**	
											Good	0	
											Invalid	1	
											Out of Range	2	
											Exclusion	3	
		Longwave Flux Over Ice Quality (Indicates quality of retrieved value)	4			unitless	No		2 bit(s)	**Name** / **Value**	**Name**	**Value**	
											Good	0	
											Invalid	1	
											Out of Range	2	
											Exclusion	3	
		Sea Surface Temperature Input is of poor quality	6			unitless	No		1 bit(s)	**Name** / **Value**	**Name**	**Value**	
											False	0	
											True	1	
		Ice Surface Temperature Input is of poor quality	7			unitless	No		1 bit(s)	**Name** / **Value**	**Name**	**Value**	
											False	0	
											True	1	
QF4_VIIRSNHFEDR	1byte(s)												

Name	**Attribute Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
AlongTrack	N_Rows	Yes	No	48	48
CrossTrack	N_Columns	No	No	254	254

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 Interpolation and Climatology/NAAPS Processing Used. NAAPS or Climatology used in processing identified in EDR	0			unitless	No		2 bit(s)	**Name** / **Value**	**Name**	**Value**
									Direct VIIRS retrieval	0
									Interpolation Only	1
									Interpolation & Climatology/NAAPS	2
									Climatology/NAAPS	3

		metadata.											
		Suspended Matter Index Input is of poor quality	2			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**
											False	0
											True	1
		Chlorophyll Input is of poor quality	3			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**
											False	0
											True	1
		Sea Ice Age Input is of poor quality	4			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**
											False	0
											True	1
		Exclusion - Cloud Present (80% or more of the moderate resolution pixels in the horizontal cell are not assigned “Confidently Clear” by the VIIRS Cloud Mask (VCM))	5			unitless	No		2 bit(s)	**Name** **Value**	**Name**	**Value**
											Clear Ocean (Water or Ice) Fraction >= 0.8	0
											0.8 > Clear Ocean Fraction > 0.1	1
											Clear Ocean Fraction <= 0.1 or Land	2
		Sun Glint detected in horizontal cell (sun glint in horizontal cell < 36 degrees for more than 50% of aggregated pixels)	7			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**
											False	0
											True	1

QF5_VIIRSNHFEDR	1byte(s)	**Name**	**Attribute Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
		AlongTrack	N_Rows	Yes	No	48	48
		CrossTrack	N_Columns	No	No	254	254

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

		Wind Speed Source/Exclusion (Indicates the source of wind speed if less than exclusion condition or indicates that the average wind speed in horizontal cell exceeds 25 m/s)	0			unitless	No		2 bit(s)	**Name** **Value**	**Name**	**Value**
											Not Used	0
											NWP	1
											Exclusion (> 25 m/s)	2
											MIS	3
		Exclusion: If average AOT in horizontal cell > 1.0 (AOT @550nm), the exclusion condition is exceeded	2			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**
											AOT within Range	0
											AOT out of range	1
		Spare	3			unitless	No		5 bit(s)	**Name** **Value**	**Name**	**Value**

5.5.4.3 Net Heat Flux HDF5 Details

Figure 5.5.4.3-1, VIIRS Net Heat Flux UML Diagram, provides details on the content and datatypes of the NHF product. This UML provides details at the product level detail only. In addition to this UML, refer to the CDFCB-X, Volume IV, Part 1, D34862-04-01, Figure 1.2.1-1, Figure 1.2.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

VIIRS-NHF-EDR
+NetHeatFlux_Total : H5T_NATIVE_FLOAT +NetHeatFlux_Water : H5T_NATIVE_FLOAT +NetHeatFlux_Ice : H5T_NATIVE_FLOAT +LatentHeatFlux_Water : H5T_NATIVE_FLOAT +LatentHeatFlux_Ice : H5T_NATIVE_FLOAT +SensibleHeatFlux_Water : H5T_NATIVE_FLOAT +SensibleHeatFlux_Ice : H5T_NATIVE_FLOAT +LW_Flux_Water : H5T_NATIVE_FLOAT +LW_Flux_Ice : H5T_NATIVE_FLOAT +SW_Flux_Water : H5T_NATIVE_FLOAT +SW_Flux_Ice : H5T_NATIVE_FLOAT +Total_Number_Pixels_In_Cell : H5T_NATIVE_SHORT +Number_Clear_Pixels_In_Cell : H5T_NATIVE_SHORT +Number_Water_Pixels_In_Cell : H5T_NATIVE_SHORT +Number_Ice_Pixels_In_Cell : H5T_NATIVE_SHORT +QF1_VIIRSNHFEDR : H5T_NATIVE_UCHAR +QF2_VIIRSNHFEDR : H5T_NATIVE_UCHAR +QF3_VIIRSNHFEDR : H5T_NATIVE_UCHAR +QF4_VIIRSNHFEDR : H5T_NATIVE_UCHAR +QF5_VIIRSNHFEDR : H5T_NATIVE_UCHAR

Figure 5.5.4.3-1, VIIRS Net Heat Flux UML Diagram

5.5.4.4 Net Heat Flux HDF5 Metadata Details

The HDF5 metadata elements associated with the Net Heat Flux EDR are listed in the CDFCB-X Volume V – Metadata, D34862-05, Section 4.3, HDF5 (Metadata) Hierarchy. The NHF metadata includes all common metadata at the root, product, aggregation, and granule level.

In addition to the common metadata items for Net Heat Flux, the following items are included as name/value pairs under the granule level metadata attribute "N_Quality_Summary":

Table 5.5.4.4-1, VIIRS NHF N_Quality_Summary Granule Level Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Notes**
Total Net Heat Flux Product Quality	0 – 100%	Percent of cells within this granule with a high quality of retrieval	
Exclusion Summary	0 – 100%	Percent of cells in this granule that have one or more of the exclusion criteria met	
Exclusion – No Ocean Coverage	0 = “Ocean Present in Granule”	This horizontal cell is/is not characterized as over ocean	
	1 = “No Ocean Present in Granule”		

5.5.4.5 Net Heat Flux Geolocation Details

Data Mnemonic	None
Description/ Purpose	The Net Heat Flux Geolocation is produced at the same resolution as the Net Heat Flux Product.
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.
File Size	Geolocation Estimated Granule Size: 395.77 KiB This granule size includes Net Heat Flux related fields and quality flags only. Geolocation and metadata attributes are not included. Additional size added by HDF5 packaging is also not included.
File Format Type	HDF5
Data Content and Data Format	For each aggregated area, the Net Heat Flux Geolocation contains: Time Fields Geolocation Angular Fields Height and Satellite Range Spacecraft Position, Velocity, and Attitude Spacecraft Solar Zenith and Azimuth Angles Geolocation Quality Flags See Section 5.5.4.5, Net Heat Flux Geolocation Data Details See Section 5.5.4.6, Net Heat Flux Geolocation Product Profile See Section 5.5.4.7, Net Heat Flux Geolocation HDF5 Details See Section 5.5.4.8, Net Heat Flux Geolocation HDF5 Metadata Details

Table 5.5.4.5-1, Net Heat Flux Geolocation Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
StartTime	Starting Time of each scan in IET (1/1/1958)	64-bit integer	[N*48]	[48]	microsecond
MidTime	Mid-Time of each scan in IET (1/1/1958)	64-bit integer	[N*48]	[48]	microsecond
Latitude	Latitude of each cell (positive North)	32-bit floating point	[N*48, 254]	[48, 254]	degree
Longitude	Longitude of each cell (positive East)	32-bit floating point	[N*48, 254]	[48, 254]	degree
SolarZenithAngle	Zenith angle of sun at each cell position	32-bit floating point	[N*48, 254]	[48, 254]	degree
SolarAzimuthAngle	Azimuth angle of sun (measured clockwise positive from North) at each cell position	32-bit floating point	[N*48, 254]	[48, 254]	degree
SatelliteZenithAngle	Zenith angle to Satellite at each cell position	32-bit floating point	[N*48, 254]	[48, 254]	degree
SatelliteAzimuthAngle	Azimuth angle (measured clockwise positive from North) to Satellite at each cell position	32-bit floating point	[N*48, 254]	[48, 254]	degree
Height	Height above Mean Sea Level	32-bit floating point	[N*48, 254]	[48, 254]	meter
SatelliteRange	Line of sight distance from the ellipsoid intersection to the satellite	32-bit floating point	[N*48, 254]	[48, 254]	meter

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
SCPosition	Spacecraft position in ECR Coordinates (X, Y, Z) at the mid-time of scan	32-bit floating point	[N*48, 3]	[48, 3]	meter
SCVelocity	Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the mid-time of scan	32-bit floating point	[N*48, 3]	[48, 3]	m/s
SCAttitude	Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at the midtime of scan	32-bit floating point	[N*48, 3]	[48, 3]	arcsecond
SCSolarZenithAngle	The angle from the normal vector of the Solar Diffuser surface (z-axis of the solar diffuser frame) to the solar vector	32-bit floating point	[N*48]	[48]	degree
SCSolarAzimuthAngle	The angle from the Solar Diffuser reference frame x-axis to the projection of the solar vector onto the solar diffuser surface (x-y plane), measured counterclockwise (observer looking toward the SD surface)	32-bit floating point	[N*48]	[48]	degree
QF1_SCAN_VIIRSNHFGEO	Scan Level Geolocation Quality Flags	unsigned 8-bit char	[N*48]	[48]	unitless
QF2_VIIRSNHFGEO	Cell Level Geolocation Quality Flags	unsigned 8-bit char	[N*48, N*254]	[48, 254]	unitless

5.5.4.6 Net Heat Flux Geolocation Product Profile

Table 5.5.4.6-1, Net Heat Flux Geolocation Product Profile Summary

Fields																	
Name	**Data Size**	**Dimensions**															
StartTime	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**											
		Scan	Yes	No	48	48											
		Datum															
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**					
		Starting Time of each scan in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**				
										NA_INT64_FILL	-999						
										MISS_INT64_FILL	-998						
										ERR_INT64_FILL	-995						
										VDNE_INT64_FILL	-993						
MidTime	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**											
		Scan	Yes	No	48	48											
		Datum															
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**					
		Mid-Time of each scan in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**				
										NA_INT64_FILL	-999						
										MISS_INT64_FILL	-998						
										ERR_INT64_FILL	-995						
										VDNE_INT64_FILL	-993						
Latitude	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**											
		AlongTrack	Yes	No	48	48											
		CrossTrack	No	No	254	254											
		Datum															
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**					
		Latitude of each cell (positive North)	0			degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**				
										NA_FLOAT32_FILL	-999.9						
										MISS_FLOAT32_FILL	-999.8						
										ERR_FLOAT32_FILL	-999.5						
										ELINT_FLOAT32_FILL	-999.4						
										VDNE_FLOAT32_FILL	-999.3						

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Longitude	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**								
		AlongTrack	Yes	No	48	48								
		CrossTrack	No	No	254	254								
		Datum												
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**		
		Longitude of each cell (positive East)	0			degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**	
										NA_FLOAT32_FILL	-999.9			
										MISS_FLOAT32_FILL	-999.8			
										ERR_FLOAT32_FILL	-999.5			
										ELINT_FLOAT32_FILL	-999.4			
										VDNE_FLOAT32_FILL	-999.3			
SolarZenithAngle	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**								
		AlongTrack	Yes	No	48	48								
		CrossTrack	No	No	254	254								
		Datum												
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**		
		Zenith angle of sun at each cell position	0			degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**	
										NA_FLOAT32_FILL	-999.9			
										MISS_FLOAT32_FILL	-999.8			
										ERR_FLOAT32_FILL	-999.5			
										ELINT_FLOAT32_FILL	-999.4			
										VDNE_FLOAT32_FILL	-999.3			
SolarAzimuthAngle	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**								
		AlongTrack	Yes	No	48	48								
		CrossTrack	No	No	254	254								
		Datum												
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**		
		Azimuth angle of sun (measured clockwise positive from North) at each cell position	0			degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**	
										NA_FLOAT32_FILL	-999.9			
										MISS_FLOAT32_FILL	-999.8			
										ERR_FLOAT32_FILL	-999.5			
										ELINT_FLOAT32_FILL	-999.4			
										VDNE_FLOAT32_FILL	-999.3			
SatelliteZenithAngle	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**								
		AlongTrack	Yes	No	48	48								
		CrossTrack	No	No	254	254								

		Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Zenith angle to Satellite at each cell position	0			degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								ELINT_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		

SatelliteAzimuthAngle	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	48	48
CrossTrack	No	No	254	254

Datum

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

Height	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	48	48
CrossTrack	No	No	254	254

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Height above Mean Sea Level	0			meter	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								ELINT_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		

SatelliteRange	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	48	48
CrossTrack	No	No	254	254

Datum

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

		Line of sight distance from the ellipsoid intersection to the satellite	0			meter	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; ELINT_FLOAT32_FILL -999.4; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**		
SCPosition	4byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size**: Scan, Yes, No, 48, 48; ECRCoordinate, No, No, 3, 3											
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Spacecraft position in ECR Coordinates (X, Y, Z) at the mid-time of scan	0			meter	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**		
SCVelocity	4byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size**: Scan, Yes, No, 48, 48; ECRCoordinate, No, No, 3, 3											
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the mid-time of scan	0			m/s	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**		
SCAttitude	4byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size**: Scan, Yes, No, 48, 48; GRFCoordinate, No, No, 3, 3											
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at the midtime of	0			arcsecond	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5	**Name** / **Value**		

		scan								VDNE_FLOAT32_FILL	-999.3	

SCSolarZenithAngle — 4byte(s)

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

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
The angle from the normal vector of the Solar Diffuser surface (z-axis of the solar diffuser frame) to the solar vector	0			degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SCSolarAzimuthAngle — 4byte(s)

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

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
The angle from the Solar Diffuser reference frame x-axis to the projection of the solar vector onto the solar diffuser surface (x-y plane), measured counterclockwise (observer looking toward the SD surface)	0			degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Table 5.5.4.6-2, Net Heat Flux Geolocation Product Profile – Quality Flags

Fields

Name	Data Size	Dimensions
QF1_SCAN_VIIRSNHFGEO	1byte(s)	

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

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Attitude and Ephemeris Availability Status	0			unitless	No		2 bit(s)	Name / Value	Name / Value Nominal - E&A data available / 0 Missing Data <= Small Gap / 1 Small Gap < Missing Data < Granule Boundary / 2 Missing Data >= Granule Boundary / 3
HAM/RTA Encoder Flag - (Indicates the quality of the HAM and RTA encoder timestamps	2			unitless	No		2 bit(s)	Name / Value	Name / Value Good Data / 0 Bad Data – either HAM, RTA, or both are bad for the entire scan / 1 Degraded Data – either HAM, RTA, or both are corrupted within the scan. / 2 Missing Data – Missing encoder data for the scan / 3
Within South Atlantic Anomaly	4			unitless	No		1 bit(s)	Name / Value	Name / Value False / 0 True / 1
Solar Eclipse during Earth view scan	5			unitless	No		1 bit(s)	Name / Value	Name / Value False / 0 True / 1
Spare	6			unitless	No		2 bit(s)	Name / Value	Name / Value

Name	Data Size	Dimensions
QF2_VIIRSNHFGEO	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size

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AlongTrack	Yes	No	48	48
CrossTrack	Yes	No	254	254

Datum

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

5.5.4.7 Net Heat Flux Geolocation HDF5 Details

The Net Heat Flux Geolocation is based on the average position of the (12km x 12km) aggregated cells, each of which is based on the VIIRS moderate resolution SDR, terrain corrected. Figure 5.5.4.7-1, VIIRS Net Heat Flux Geolocation UML Diagram, provides details on the contents and datatypes of the NHF geolocation.

VIIRS-NHF-EDR-GEO
+StartTime : H5T_NATIVE_LLONG +MidTime : H5T_NATIVE_LLONG +Latitude : H5T_NATIVE_FLOAT +Longitude : H5T_NATIVE_FLOAT +SolarZenithAngle : H5T_NATIVE_FLOAT +SolarAzimuthAngle : H5T_NATIVE_FLOAT +SatelliteZenithAngle : H5T_NATIVE_FLOAT +SatelliteAzimuthAngle : H5T_NATIVE_FLOAT +Height : H5T_NATIVE_FLOAT +SatelliteRange : H5T_NATIVE_FLOAT +SCPosition : H5T_NATIVE_FLOAT +SCVelocity : H5T_NATIVE_FLOAT +SCAttitude : H5T_NATIVE_FLOAT +SCSolarZenithAngle : H5T_NATIVE_FLOAT +SCSolarAzimuthAngle : H5T_NATIVE_FLOAT +QF1_SCAN_VIIRSNHFGEO : H5T_NATIVE_UCHAR +QF2_VIIRSNHFGEO : H5T_NATIVE_UCHAR

Figure 5.5.4.7-1, VIIRS Net Heat Flux Geolocation UML Diagram

5.5.4.8 Net Heat Flux Geolocation HDF5 Metadata Details

The HDF5 metadata elements associated with the Net Heat Flux Geolocation EDR are listed in the CDFCB-X Volume V – Metadata, D34862-05, Section 4.3, HDF5 (Metadata) Hierarchy. The NHF Geolocation metadata includes all common metadata at the root, product, aggregation, and granule level.

In addition to the common metadata items for Net Heat Flux, the following items are included as name/value pairs under the granule level metadata attribute "N_Quality_Summary":

Table 5.5.4.8-1, VIIRS NHF Geolocation N_Quality_Summary Granule Level Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Notes**
QA Percent Missing Data	0 – 100%	Contains the percentage of missing data equal to the quotient of the number of pixels with missing data over the total number of pixels in the granule.	
QA Percent Out of Bounds Data	0 – 100%	Contains the percentage of out of bounds data equal to the quotient of the number of pixels with out of bounds data over the total number of pixels in the granule.	
Automatic Quality Flag	0 = “Retrieval Successful” 1 = “Retrieval not Successful” (one or more geolocation subroutines failed)	String containing “Retrieval Successful” or “Retrieval not Successful” depending on granule level quality assurance metadata retrieval success	

5.5.5 Ocean Color/Chlorophyll

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} μm^{-1} sr^{-1} Ocean optical properties, absorption and backscattering, are estimated at each measured visible wavelength, and have units of m^{-1} while chlorophyll-α 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: NPP and NPOESS
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.
File Size	Estimated Granule Size: 166.4 MiB 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 5.5.5.1, VIIRS Ocean Color Chlorophyll Data Content Summary See Section 5.5.5.2, VIIRS Ocean Color Chlorophyll Product Profile See Section 5.5.5.3, VIIRS Ocean Color Chlorophyll HDF5 Details See Section 5.5.5.4, VIIRS Ocean Color Chlorophyll HDF5 Metadata Details See Section 5.5.5.5, VIIRS Ocean Color Chlorophyll Geolocation

	Details

5.5.5.1 VIIRS Ocean Color Chlorophyll Data Content Summary

Table 5.5.5.1-1, VIIRS Ocean Color Chlorophyll Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	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

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
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 µm sr)
nLw_445nm	Normalized Water Leaving Radiance at 445nm	32-bit floating point	[N*768, 3200]	[768, 3200]	W/(m^2 µm sr)
nLw_488nm	Normalized Water Leaving Radiance at 488nm	32-bit floating point	[N*768, 3200]	[768, 3200]	W/(m^2 µm sr)
nLw_555nm	Normalized Water Leaving Radiance at 555nm	32-bit floating point	[N*768, 3200]	[768, 3200]	W/(m^2 µm sr)
nLw_672nm	Normalized Water Leaving Radiance at 672nm	32-bit floating point	[N*768, 3200]	[768, 3200]	W/(m^2 µm sr)
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

5.5.5.2 VIIRS Ocean Color Chlorophyll Product Profile

Table 5.5.5.2-1, 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**
		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	**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	
										ELINT_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**
		Inherent Optical Properties - Absorption at 412nm	0	0.01	10	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	
										ELINT_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**	**Unscaled**	**Unscaled**	**Measurement**	**Scaled**	**Scale**	**Data**	**Fill Values**		**Legend**

This document has been identified per the NPOESS Common Data Format Control Book – External Volume 5 Metadata, D34862-05, Appendix B as a document to be provided to the NOAA Comprehensive Large Array-data Stewardship System (CLASS) via the delivery of NPOESS Document Release Packages to CLASS.

			Offset	Valid Range Min	Valid Range Max	Units		Factor Name	Type			Entries	
		Inherent Optical Properties - Absorption at 445nm	0	0.01	10	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		
										ELINT_FLOAT32_FILL	-999.4		
										VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
IOP_a_488nm	4byte(s)	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 - Absorption at 488nm	0	0.01	10	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		
								ELINT_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
IOP_a_555nm	4byte(s)	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 - Absorption at 555nm	0	0.01	10	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		
								ELINT_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
IOP_a_672nm	4byte(s)	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 - Absorption at 672nm	0	0.01	10	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		
								ELINT_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	
Inherent Optical Properties - Backscattering at 412nm	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		
								ELINT_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	
Inherent Optical Properties - Backscattering at 445nm	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		
								ELINT_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	
Inherent Optical Properties - Backscattering at 488nm	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		
								ELINT_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		
								ELINT_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	
										ELINT_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 µm sr)	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		
								ELINT_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 µm sr)	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		
								ELINT_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 µm sr)	No		32-bit floating point	**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 ELINT_FLOAT32_FILL / -999.4 VDNE_FLOAT32_FILL / -999.3	**Name** / **Value**
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 µm sr)	No		32-bit floating point	**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 ELINT_FLOAT32_FILL / -999.4 VDNE_FLOAT32_FILL / -999.3	**Name** / **Value**
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 µm sr)	No		32-bit floating point	**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 ELINT_FLOAT32_FILL / -999.4 VDNE_FLOAT32_FILL / -999.3	**Name** / **Value**

Table 5.5.5.2-2, 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	
								Name	Value	Name	Value
Ocean Color Quality at 412nm (Indicates pixel level Normalized Water-Leaving Radiance quality at M1) This flag is set to “Poor” if (1) The M5-Band RSR values indicate Turbid Water OR (2) The 412nm (M1-Band) nLw is out of the system spec range OR (3) Coccolithophores are present. A Bright Pixel also sets this flag to “Poor”.	0			unitless	No		1 bit(s)			Good	0
										Poor	1
Ocean Color Quality at 445nm (Indicates pixel level Normalized Water-Leaving Radiance quality at M2) This flag is set to “Poor” if (1) The M5-Band RSR values indicate Turbid Water OR (2) The 445nm (M2-Band) nLw is out of the system spec range OR (3) Coccolithophores are present. A Bright Pixel also sets this flag to “Poor”.	1			unitless	No		1 bit(s)	Name	Value	Name	Value
										Good	0
										Poor	1
Ocean Color Quality at 488nm (Indicates pixel level Normalized Water-Leaving Radiance quality at M3) This flag is set to “Poor” if (1) The M5-Band RSR values indicate Turbid Water OR (2) The 488nm (M3-Band) nLw is out of the system spec range OR (3) Coccolithophores are present. A Bright Pixel also sets this flag to “Poor”.	2			unitless	No		1 bit(s)	Name	Value	Name	Value
										Good	0
										Poor	1
Ocean Color Quality at 555nm (Indicates pixel level Normalized Water-Leaving Radiance quality at M4) This flag is set to “Poor” if (1) The M5-Band RSR values indicate Turbid Water OR (2) The 555 (M4-Band) nm nLw is out of the system spec range OR (3) Coccolithophores are present. A Bright Pixel also sets this flag to “Poor”.	3			unitless	No		1 bit(s)	Name	Value	Name	Value
										Good	0
										Poor	1

		Ocean Color Quality at 672nm (Indicates pixel level Normalized Water-Leaving Radiance quality at M5) This flag is set to “Poor” if (1) The M5-Band RSR values indicate Turbid Water OR (2) The 672nm (M5-Band) nLw is out of the system spec range OR (3) The M5-Band RSR is out of the system spec range OR (3) Coccolithophores are present. A Bright Pixel also sets this flag to “Poor”.	4			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**	Good	0
													Poor	1
		Chlorophyll a Concentration Quality (Indicates pixel level chlorophyll a concentration quality) This flag is set to “Poor” if: (1) The Chlorophyll-a is out of the system spec range OR (2) Any band’s IOP-a or IOP-s value is outside the system spec range OR (3) Coccolithophores are present. A Bright Pixel also sets this flag to “Poor”.	5			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**	Good	0
													Poor	1
		IOP_a Quality at 412nm (Indicates pixel level IOP-a quality at M1) This flag is set to “Poor” if (1) The M5-Band RSR values indicate Turbid Water OR (2) The 412nm nLw is out of the system spec range OR (3) Coccolithophores are present. A Bright Pixel also sets this flag to “Poor”.	6			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**	Good	0
													Poor	1
		IOP_s Quality at 412nm (Indicates pixel level IOP-s quality at M1) This flag is set to “Poor” if (1) The M5-Band RSR values indicate Turbid Water OR (2) The 412nm nLw is out of the system spec range OR (3) Coccolithophores are present. A Bright Pixel also sets this flag to “Poor”.	7			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**
IOP_a Quality at 445nm (Indicates pixel level IOP-a quality at M2) This flag is set to “Poor” if (1) The M5-Band RSR values indicate Turbid Water OR (2) The 445nm (M2-Band) nLw is out of the system spec range OR (3) Coccolithophores are present. A Bright Pixel also sets this flag to “Poor”.	0			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** Good 0 Poor 1
IOP_s Quality at 445nm (Indicates pixel level IOP-s quality at M2) This flag is set to “Poor” if (1) The M5-Band RSR values indicate Turbid Water OR (2) The 445nm (M2-Band) nLw is out of the system spec range OR (3) Coccolithophores are present. A Bright Pixel also sets this flag to “Poor”.	1			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** Good 0 Poor 1

		IOP_a Quality at 488nm (Indicates pixel level IOP-a quality at M3) This flag is set to “Poor” if (1) The M5-Band RSR values indicate Turbid Water OR (2) The 488nm (M3-Band) nLw is out of the system spec range OR (3) Coccolithophores are present. A Bright Pixel also sets this flag to “Poor”.	2			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** Good 0 Poor 1
		IOP_s Quality at 488nm (Indicates pixel level IOP-s quality at M3) This flag is set to “Poor” if (1) The M5-Band RSR values indicate Turbid Water OR (2) The 488nm (M3-Band) nLw is out of the system spec range OR (3) Coccolithophores are present. A Bright Pixel also sets this flag to “Poor”.	3			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** Good 0 Poor 1
		IOP_a Quality at 555nm (Indicates pixel level IOP-a quality at M4) This flag is set to “Poor” if (1) The M5-Band RSR values indicate Turbid Water OR (2) The 555nm (M4-Band) nLw is out of the system spec range OR (3) Coccolithophores are present. A Bright Pixel also sets this flag to “Poor”.	4			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** Good 0 Poor 1
		IOP_s Quality at 555nm (Indicates pixel level IOP-s quality at M4) This flag is set to “Poor” if (1) The M5-Band RSR values indicate Turbid Water OR (2) The 555nm (M4-Band) nLw is out of the system spec range OR (3) Coccolithophores are present. A Bright Pixel also sets this flag to “Poor”.	5			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** Good 0 Poor 1
		IOP_a Quality at 672nm (Indicates pixel level IOP-a quality at M5) This flag is set to “Poor” if (1) The M5-Band RSR values indicate Turbid Water OR (2) The 672nm (M5-Band) nLw is out of the system spec range OR (3) Coccolithophores are present. A Bright Pixel also sets this flag to “Poor”.	6			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** Good 0 Poor 1
		IOP_s Quality at 672nm (Indicates pixel level IOP-s quality at M5) This flag is set to “Poor” if (1) The M5-Band RSR values indicate Turbid Water OR (2) The 672nm (M5-Band) nLw is out of the system spec range OR (3) Coccolithophores are present. A Bright Pixel also sets this flag to “Poor”.	7			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			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			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**	
												Good	0	
												Poor	1	
		Wind speed exceeds threshold of 8 m/s (Whitecap formation)	2			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			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			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			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			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			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			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			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			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**	
											False	0	
											True	1	
		Degradation - Horizontal cell contains shallow water; Depth < 50 meters	6			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**	
											False	0	
											True	1	
		Spare	7			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			unitless	No		2 bit(s)	**Name**	**Value**	**Name**	**Value**
										Confidently clear	0
										Confidently clear	1
										Probably cloudy	2
										Confidently cloudy	3

		Adjacent Pixel is not confidently clear (as determined by the VIIRS Cloud Mask)	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		Thin Cirrus Cloud Detected in Pixel as determined by the VIIRS Cloud Mask	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		Exclusion: Cloud Shadow detected in Pixel (as determined by the VIIRS Cloud Mask	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		Non-Cloud Obstruction detected in Pixel (Heavy Aerosol) - as determined by the VIIRS Cloud Mask	5			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		Exclusion: Strongly absorbing aerosol detected in pixel (Single scattering albedo at M4 wavelength (555nm) <0.7)	6			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		Exclusion: AOT > 0.3 (AOT in horizontal cell > 0.3 on the slant path (AOT @865nm, M7))	7			unitless	No		1 bit(s)	Name Value	Name Value 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			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Coccolithophores detected in Pixel : (nLw(M2)>=1.1 & nLw(M4)>=0.81 & Laero(M6)<= 1.1 & 0.6<=nLw(M2)/nLw(M4)<=1.1)	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Exclusion: Dissolved organic matter absorption at 410nm > 2/meter	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1

		Range of Chlorophyll Concentration	3			unitless	No		2 bit(s)	**Name** **Value**	**Name**	**Value**		
											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			unitless	No		3 bit(s)	**Name** **Value**	**Name**	**Value**		
											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		
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			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			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			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			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**		
											False	0		
											True	1		
		Input Skin SST EDR Quality (Input Skin SST EDR Quality)	4			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			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**
												Not Bright (bpflag <= 0.002)	0
												Bright	1
		Chlorophyll Algorithm Branching	6			unitless	No		2 bit(s)	**Name**	**Value**	**Name**	**Value**
												Carder algorithm with Carder empitical	0
												Carder algorithm with OC3V default	1
												OC3V algorithm	2
												No Retrieval	3

5.5.5.3 VIIRS Ocean Color Chlorophyll HDF5 Details

Figure 5.5.5.3-1, VIIRS Ocean Color Chlorophyll UML Diagram, provides details on the contents and data types of the Ocean Color Chlorophyll product. This UML provides details at the product level detail only. In addition to this UML, refer to the CDFCB-X, Volume IV, Part 1, D34862-04-01, Figure 1.2.1-1, Figure 1.2.1-1, 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 +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 +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 +QF7_VIIRSOCCEDR : H5T_NATIVE_UCHAR

Figure 5.5.5.3-1, VIIRS Ocean Color Chlorophyll HDF5 UML Diagram

5.5.5.4 VIIRS Ocean Color Chlorophyll HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Ocean Color Chlorophyll are listed in the CDFCB-X Volume V – Metadata, D34862-05. 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 5.5.5.4-1, VIIRS Ocean Color Chlorophyll N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level 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 Surface Type EDR.

Table 5.5.5.4-1, VIIRS Ocean Color Chlorophyll N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Notes**
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	
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	

N_Quality_Summary			
Name	**Value**	**Description**	**Notes**
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	
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	
Exclusion Summary	0 – 100	Percent of pixels in one or more exclusion conditions	
Summary Ocean Color Range Check	0 – 100	Percent of Ocean Color Retrievals (all bands) that are out of expected range	
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	
Exclusion – No Ocean Present	0 or 1	Granule contains no ocean coverage	0 = Ocean present 1 = No ocean present

5.5.5.5 VIIRS Ocean Color Chlorophyll EDR Geolocation Details

VIIRS Ocean Color Chlorophyll EDR is produced on the VIIRS Moderate Resolution Geolocation – Terrain Corrected. See the CDFCB-X, Volume IV, Part 1, D34862-04-01, Section 4.9.5, VIIRS Moderate Resolution Geolocation – Terrain Corrected for details.

This document has been identified per the NPOESS Common Data Format Control Book – External Volume 5 Metadata, D34862-05, Appendix B as a document to be provided to the NOAA Comprehensive Large Array-data Stewardship System (CLASS) via the delivery of NPOESS Document Release Packages to CLASS.

5.5.6 DELETED

This document has been identified per the NPOESS Common Data Format Control Book – External Volume 5 Metadata, D34862-05, Appendix B as a document to be provided to the NOAA Comprehensive Large Array-data Stewardship System (CLASS) via the delivery of NPOESS Document Release Packages to CLASS.

5.5.7 Sea Ice Characterization

Sea ice age is defined as the time that has passed since the formation of the surface layer of an ice covered region of the ocean. The content of the Sea Ice Characterization EDR is the typing of areas of sea ice by age.

This document has been identified per the NPOESS Common Data Format Control Book – External Volume 5 Metadata, D34862-05, Appendix B as a document to be provided to the NOAA Comprehensive Large Array-data Stewardship System (CLASS) via the delivery of NPOESS Document Release Packages to CLASS.

5.5.7.1 DELETED

This document has been identified per the NPOESS Common Data Format Control Book – External Volume 5 Metadata, D34862-05, Appendix B as a document to be provided to the NOAA Comprehensive Large Array-data Stewardship System (CLASS) via the delivery of NPOESS Document Release Packages to CLASS.

5.5.7.2 VIIRS Sea Ice Characterization

Data Mnemonic	EDRE-SICH-C1030 (Official) EDRE-SICH-C1031 (Substitute)
Description/ Purpose	Sea ice age is defined as the time that has passed since the formation of the surface layer of an ice covered region of the ocean. The content of the Sea Ice Characterization EDR is the typing of areas of sea ice by age. Sensors: VIIRS Effectivity: NPP and NPOESS
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.
File Size	Estimated Granule Size: 18.75 MiB This granule size includes Sea Ice Age 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 5.5.7.2.1, VIIRS Sea Ice Characterization Data Content Summary See Section 5.5.7.2.2, VIIRS Sea Ice Characterization Product Profile See Section 5.5.7.2.3, VIIRS Sea Ice Characterization HDF5 Details See Section 5.5.7.2.4, VIIRS Sea Ice Characterization HDF5 Metadata Details See Section 5.5.7.2.5, VIIRS Sea Ice Characterization Geolocation Data Content Summary

5.5.7.2.1 VIIRS Sea Ice Characterization Data Content Summary

Table 5.5.7.2.1-1, VIIRS Sea Ice Characterization Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
IceAgeWeight	Ice Age Weighting Factors derived from Ice Age LUT and scene conditions (fire, clouds,	32-bit floating point	[N*768, 3200]	[768, 3200]	unitless

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
	sunglint, I-Band quality, etc.)				
IceAge	Various classifications of ice for I1, I2, Surface Temperature IP, and weighted cell total	unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF1_VIIRSSICEDR	Pixel level quality flags	unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF2_VIIRSSICEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF3_VIIRSSICEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless

5.5.7.2.2 VIIRS Sea Ice Characterization Product Profile

Table 5.5.7.2.2-1, VIIRS Sea Ice Characterization Product Profile

Fields

Name	Data Size	Dimensions
IceAgeWeight	4byte(s)	
IceAge	1byte(s)	

IceAgeWeight — Dimensions

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

IceAgeWeight — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type
Ice Age Weighting Factors derived from Ice Age LUT and scene conditions (fire, clouds, sunglint, I-Band quality, etc.)	0			unitless	No		32-bit floating point

IceAgeWeight — Fill Values

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
ELINT_FLOAT32_FILL	-999.4
VDNE_FLOAT32_FILL	-999.3

IceAgeWeight — Legend Entries

Name	Value

IceAge — Dimensions

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

IceAge — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type
Various classifications of ice for I1, I2, Surface Temperature IP, and weighted cell total	0			unitless	No		unsigned 8-bit char

IceAge — Fill Values

Name	Value
NA_UINT8_FILL	255
MISS_UINT8_FILL	254
ONBOARD_PT_UINT8_FILL	253
ONGROUND_PT_UINT8_FILL	252
ERR_UINT8_FILL	251
ELINT_UINT8_FILL	250
ELINT_UINT8_FILL	249

IceAge — Legend Entries

Name	Value
Unclassified	0
Ice Free	1
New or Young Ice	2
All Other Ice	4
Land Fill	10
Cloud Fill	12

Table 5.5.7.2.2-2, VIIRS Sea Ice Characterization Product Profile – Quality Flags

Fields

Name	Data Size	Dimensions
QF1_VIIRSSICEDR	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	
								Name	Value	Name	Value
Ice Age Overall Quality	0			unitless	No		2 bit(s)			Green (good quality)	0
										Yellow (degraded quality)	1
										Red (bad quality)	2
										No Retrieval (Fill)	3
Input Data Quality	2			unitless	No		1bit(s)			Good	0
										Bad	1
Cloud Confidence	3			unitless	No		2 bit(s)			Confidently clear	0
										Probably clear	1
										Probably cloudy	2
										Confidently cloudy	3
Thermal Contrast Degradation: 1.5K < Thermal contrast < 2.2K	5			unitless	No		1 bit(s)			False	0
										True	1
Sea Ice Valid Region Exclusion: Pixel is outside of valid region. Valid region is latitude > 36 degrees N or latitude > 50 degrees S	6			unitless	No		1 bit(s)			False	0
										True	1

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		Exclusion: Aerosol Optical Thickness slant path at 550nm > 1.0	7			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1

QF2_VIIRSSICEDR 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: Thermal Contrast < 1.5K	0			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1
No Ice detected in horizontal cell (Ice concentration is <= 0.1)	1			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1
Exclusion: No Ocean present in horizontal cell	2			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1
Algorithm Branching	3			unitless	No		2 bit(s)	**Name** **Value**	**Name** **Value** Unclassified 0 RT:Reflectance Threshold Method 1 THB:Thermal Heat Balance Method 2
Heavy Aerosol present in horizontal cell	5			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1
Spare	6			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value**
Thin Cirrus detected in horizontal cell	7			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1

QF3_VIIRSSICEDR	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
Shadow detected in horizontal cell	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Cloud Phase	1			unitless	No		2 bit(s)	Name Value	Name Value Clear 0 Water 1 Ice 2 Mixed 3
Fire detected in horizontal cell (from the VIIRS Cloud Mask)	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Sun Glint detected in horizontal cell	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Coast Line present within horizontal cell	5			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Spare	6			unitless	No		2 bit(s)	Name Value	Name Value

5.5.7.2.3 VIIRS Sea Ice Characterization HDF5 Details

Figure 5.5.7.2.3-1, VIIRS Sea Ice Characterization UML Diagram, provides details on the contents and data types of the Sea Ice Characterization product. This UML provides details at the product level detail only. In addition to this UML, refer to the CDFCB-X, Volume IV, Part 1, D34862-04-01, Figure 1.2.1-1, Figure 1.2.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

VIIRS-SIC-EDR
+IceAgeWeight : H5T_NATIVE_FLOAT +IceAge : H5T_NATIVE_UCHAR +QF1_VIIRSSICEDR : H5T_NATIVE_UCHAR +QF2_VIIRSSICEDR : H5T_NATIVE_UCHAR +QF3_VIIRSSICEDR : H5T_NATIVE_UCHAR

Figure 5.5.7.2.3-1, VIIRS Sea Ice Characterization HDF5 UML Diagram

5.5.7.2.4 VIIRS Sea Ice Characterization HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Sea Ice Characterization are listed in the CDFCB-X Volume V – Metadata, D34862-05. 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 5.5.7.2.4-1, VIIRS Sea Ice Characterization N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level 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 Surface Type EDR.

Table 5.5.7.2.4-1, VIIRS Sea Ice Characterization N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Notes**
Summary Ice Age Quality	0 – 100	Percent of horizontal cells within granule with high quality of retrieval	
Exclusion Summary	0 – 100	Percent of horizontal cells in exclusion conditions,	
Sea Ice Granule out of range	0	At least one pixel is in the valid region	
	1	Entire Granule is outside of valid region. Valid region is > +36 (36N) latitude OR < -50 (50S) latitude (Valid Region must also be over ocean)	
Exclusion – No Ocean Coverage	0	Ocean in horizontal cell	
	1	No Ocean in horizontal cell	

5.5.7.2.5 VIIRS Sea Ice Characterization Geolocation Details

VIIRS Sea Ice Age EDR is produced on the VIIRS Moderate Resolution Geolocation – Terrain Corrected. See the CDFCB-X, Volume IV, Part 1, D34862-04-01, Section 4.9.5, VIIRS Moderate Resolution Geolocation – Terrain Corrected for details.

5.5.8 DELETED

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