



NATIONAL POLAR-ORBITING OPERATIONAL ENVIRONMENTAL SATELLITE SYSTEM (NPOESS)

**Common Data Format Control Book - External
Volume IV – Part III – Land and Ocean/Water EDRs
D34862-04-03 Rev C
CDRL No. A014**

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Volume IV – Part III – Land and Ocean/Water EDRs
D34862-04-03 Rev C
CDRL No. A014**

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Revision/Change Record

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A	09/10/2007	<p>Incorporation of the following DCOs and ECRs:</p> <p>ECR 617A provides the Revision A of this document. The following ECRs/DCOs are included in this revision:</p> <ul style="list-style-type: none"> • DCO A1 D34862-04-03 CDFCB-X Vol. IV Part 3 ECR 501A - 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 • ECR 617A CIDP CDFCB-X Vol. III and Vol. IV <p>This revision also incorporates updates to the following:</p> <ul style="list-style-type: none"> • Product Profile consistency updates 	



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C	01/23/2009	Incorporation of the following DCOs and ECRs: ECR 898B provides Rev C. This rev incorporates the following DCO and ECR: <ul style="list-style-type: none"> • DCO C1 D34862-04-03 CDFCB-X Vol. IV Part 3 ECR 876 - Clean up of Clerical Error 	All

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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.

5.4.1 DELETED

5.4.2 Land Surface Temperature

Data Mnemonic	EDRE-VLST-C0030 (Official) EDRE-VLST-C0031 (Substitute)
Description/ Purpose	<p>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.</p> <p>The LST EDR is required only for horizontal cells that are categorized as “confidently clear” by the cloud mask.</p> <p>Availability Conditions:</p> <ul style="list-style-type: none"> Day Night (Solar Zenith Angle > 85°) Clear Land <p>Sensors:</p> <ul style="list-style-type: none"> VIIRS <p>Effectivity: NPP and NPOESS</p>
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.
File Size	<p>Estimated Data Granule Sizes: 11.72 MiB</p> <p>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.</p>
File Format Type	HDF5

Data Content and Data Format	<p>See Section 5.4.2.1, VIIRS Land Surface Temperature EDR Data Content Summary</p> <p>See Section 5.4.2.2, VIIRS Land Surface Temperature EDR Product Profile</p> <p>See Section 5.4.2.3, VIIRS Land Surface Temperature EDR HDF5 Details</p> <p>See Section 5.4.2.4, VIIRS Land Surface Temperature EDR Metadata Details</p> <p>See Section 5.4.2.5, VIIRS Land Surface Temperature EDR Geolocation Details</p>
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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	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	
		Land Surface Temperature	0	213.0	343.0	kelvin	Yes	LSTFactors	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 5.4.2.2-2, 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	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
											4-Band Dual Split Window	0
										2-Band Split Window	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	
Bad SWIR Pixel (M12 and M13 band data not available)	4				unitless	No		1 bit(s)	Name Value	Name	Value	
										Both Available	0	
										At least one not available	1	
Bad LWIR Pixel (M15 and M16 band data not available)	5				unitless	No		1 bit(s)	Name Value	Name	Value	
										Both Available	0	
										At least one not available	1	
Exclusion - Fire detected in pixel (from the VIIRS Cloud Mask)	6				unitless	No		1 bit(s)	Name Value	Name	Value	
										False	0	
										True	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	Value	
										False	0	
										True	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 Value	False	0	

											True	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 Value	False 0
		Cloud Confidence Indicator	2			unitless	No		2 bit(s)	Name Value	Name Value	True 1
		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 Value	Confidently Clear 0
		Exclusion - Horizontal Cell Size > 1.3km (HCS > 1.3 km, swath width > 1700 km, Sensor Zenith Angle > 50.3 degrees)	5			unitless	No		1 bit(s)	Name Value	Name Value	Probably Clear 1
		Sun Glint in pixel (as indicated in the VIIRS Cloud Mask)	6			unitless	No		1 bit(s)	Name Value	Name Value	Probably Cloudy 2
		Inside Terminator (85 deg < Solar Zenith Angle <= 100 deg)	7			unitless	No		1 bit(s)	Name Value	Name Value	Confidently Cloudy 3
												False 0
												True 1
												False 0
												True 1
												False 0
												True 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 Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries	
		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	3			unitless	No		5 bit(s)	Name Value	Name Value	

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, Generalized UML Diagram for HDF5 IP/ARP/EDR Files, for a complete UML rendering of this product.

VIIRS-LST-EDR
+LandSurfaceTemperature : H5T_NATIVE_USHORT
+QF1_VIIRSLSTEDR : H5T_NATIVE_UCHAR
+QF2_VIIRSLSTEDR : H5T_NATIVE_UCHAR
+QF3_VIIRSLSTEDR : H5T_NATIVE_UCHAR
+LSTFactors : H5T_NATIVE_FLOAT

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 retrieved pixels within granule with high quality of retrieval	

N_Quality_Summary			
Name	Value	Description	Notes
SDR Input Data Quality	0 – 100	Percent of pixels with high quality input values of brightness temperature in VIIRS SDR	
Exclusion Summary	0 – 100	Percent of retrieved pixels with excluded conditions	
Summary Range Check	0 – 100	Percent of retrieved pixels outside of expected range (213K to 343K)	
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	
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

5.4.4 DELETED

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.

Availability Conditions	Day Clear Land
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

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 Data Granule Sizes: 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 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	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 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	
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/Conifer 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				
		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, Generalized UML Diagram for HDF5 IP/ARP/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 retrieved pixels within granule with high quality of retrieval	
Exclusion Summary	0 – 100	Percent of retrieved 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 Data Granule Sizes: 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 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	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	0.0	1.0	unitless	Yes	SnowCoverFractionFactors	unsigned 16-bit integer	<table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>NA_UINT16_FILL</td> <td>65535</td> <td></td> <td></td> </tr> <tr> <td>MISS_UINT16_FILL</td> <td>65534</td> <td></td> <td></td> </tr> <tr> <td>ONBOARD_PT_UINT16_FILL</td> <td>65533</td> <td></td> <td></td> </tr> <tr> <td>ONGROUND_PT_UINT16_FILL</td> <td>65532</td> <td></td> <td></td> </tr> <tr> <td>ERR_UINT16_FILL</td> <td>65531</td> <td></td> <td></td> </tr> <tr> <td>ELINT_UINT16_FILL</td> <td>65530</td> <td></td> <td></td> </tr> <tr> <td>VDNE_UINT16_FILL</td> <td>65529</td> <td></td> <td></td> </tr> <tr> <td>SOUB_UINT16_FILL</td> <td>65528</td> <td></td> <td></td> </tr> </tbody> </table>	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				
		Name	Value	Name	Value																																											
		NA_UINT16_FILL	65535																																													
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		ONBOARD_PT_UINT16_FILL	65533																																													
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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 binary map used to calculate the snow fraction (ranges from 0 to 4)	0			unitless	No		unsigned 8-bit char	<table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>NA_UINT8_FILL</td> <td>255</td> <td></td> <td></td> </tr> <tr> <td>MISS_UINT8_FILL</td> <td>254</td> <td></td> <td></td> </tr> <tr> <td>ONBOARD_PT_UINT8_FILL</td> <td>253</td> <td></td> <td></td> </tr> <tr> <td>ONGROUND_PT_UINT8_FILL</td> <td>252</td> <td></td> <td></td> </tr> <tr> <td>ERR_UINT8_FILL</td> <td>251</td> <td></td> <td></td> </tr> <tr> <td>ELINT_UINT8_FILL</td> <td>250</td> <td></td> <td></td> </tr> <tr> <td>VDNE_UINT8_FILL</td> <td>249</td> <td></td> <td></td> </tr> </tbody> </table>	Name	Value	Name	Value	NA_UINT8_FILL	255			MISS_UINT8_FILL	254			ONBOARD_PT_UINT8_FILL	253			ONGROUND_PT_UINT8_FILL	252			ERR_UINT8_FILL	251			ELINT_UINT8_FILL	250			VDNE_UINT8_FILL	249								
		Name	Value	Name	Value																																											
		NA_UINT8_FILL	255																																													
		MISS_UINT8_FILL	254																																													
		ONBOARD_PT_UINT8_FILL	253																																													
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ERR_UINT8_FILL	251																																															
ELINT_UINT8_FILL	250																																															
VDNE_UINT8_FILL	249																																															

Table 5.4.5.2.2-2, 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/Conifer 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 No (no exclusion) Yes (exclusion condition: solar zenith angle > 85 deg)	Value 0 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 No (no exclusion) Yes (exclusion condition: AOT > 1.0 based on slant path AOT)	Value 0 1
		Thin Cirrus (based on VCM thin cirrus quality flag)	1			unitless	No		1 bit(s)	Name Value	Name No Yes (thin cirrus detected based on VCM thin cirrus quality flag)	Value 0 1
		Cloud Shadow	2			unitless	No		1 bit(s)	Name Value	Name No Cloud Shadow Cloud Shadow	Value 0 1
		Cloud Phase	4			unitless	No		2 bit(s)	Name Value	Name Clear Water Ice Mixed	Value 0 1 2 3
		Land/Water	5			unitless	No		2 bit(s)	Name Value	Name Land Coastal Inland Water Ocean	Value 0 1 2 3

		Sun Glint	6			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 5.4.5.2.2-3, 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, Generalized UML Diagram for HDF5 IP/ARP/EDR Files, for a complete UML rendering of this product.

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

Figure 5.4.5.2.2.3-1, 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 retrieved pixels within granule with high quality of retrieval	

N_Quality_Summary			
Name	Value	Description	Notes
Degradation Summary	0 – 100	Percent of retrieved pixels with degradation conditions	
Exclusion Summary	0 – 100	Percent of retrieved pixels with exclusion 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	<p>Surface type is defined as one of the seventeen International Geosphere Biosphere Program (IGBP) classes; see Table 5.4.6-1, Land Cover Classifications.</p> <p>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).</p> <p>The confidence value in QF3_VIIRSSTEDR is provided in percent ranging from 0 – 100. The value of 254 in this field indicates that the surface type is defined by the NIMA Vector Map (VMap) Level 0.</p> <p>Availability Conditions:</p> <ul style="list-style-type: none"> Day Night Clear <p>Land (Note: Surface Type is primarily a designation of Land Type, but one class is “water” which includes Oceans)</p> <p>Sensors:</p> <ul style="list-style-type: none"> VIIRS <p>Effectivity: NPP and NPOESS</p>
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.
File Size	<p>Estimated Data Granule Sizes: 11.7 MiB</p> <p>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.</p>
File Format Type	HDF5

Data Content and Data Format	<p>See Section 5.4.6.1, VIIRS Surface Type EDR Data Content Summary</p> <p>See Section 5.4.6.2, VIIRS Surface Type EDR Product Profile</p> <p>See Section 5.4.6.3, VIIRS Surface Type EDR HDF5 Details</p> <p>See Section 5.4.6.4, VIIRS Surface Type EDR Metadata Details</p> <p>See Section 5.4.6.5, VIIRS Surface Type EDR Geolocation Details</p>
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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%.

Land Cover Class	Definition
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.
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	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
QF3_VIIRSSTEDR		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										
flags	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		5 bits(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 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		
									Fill	31		

		Snow Detected in Pixel	5			unitless	No		1 bit(s)	Name Value	Name	Value
											False	0
											True	1
		Fire or Burn Mask Detected in Pixel	6			unitless	No		1 bit(s)	Name Value	Name	Value
											False	0
											True	1
		Vegetation Detected in Pixel	7			unitless	No		1 bit(s)	Name Value	Name	Value
											False	0
											True	1
VegetationFraction	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	
		Vegetation Fraction	0	0.0	1.0	unitless	Yes	VegetationFractionFactors	unsigned 8-bit char	Name	Value	Name Value
										NA_UINT8_FILL	255	
										MISS_UINT8_FILL	254	
										ONBOARD_PT_UINT8_FILL	253	
										ONGROUND_PT_UINT8_FILL	252	
										ERR_UINT8_FILL	251	
										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	Legend Entries	

		Fire detected in pixel (from the VIIRS Cloud Mask)	0			unitless	No		1 bit(s)	Name Value	Name Value	
											False 0	True 1
		Snow or Ice in Pixel (from the VIIRS Cloud Mask)	1			unitless	No		1 bit(s)	Name Value	Name Value	
											False 0	True 1
		Vegetation in Pixel (Vegetation fraction detected within the pixel exceeded threshold)	2			unitless	No		1 bit(s)	Name Value	Name Value	
											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)	Name Value	Name	Value
											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)	Name Value	Name Value	
											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)	Name Value	Name Value	
											False 0	True 1
		Spare	7			unitless	No		1 bit(s)	Name Value	Name Value	
QF2_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	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	2			unitless	No		2	Name Value	Name	Value

		Zenith Angle at center of Horizontal Cell. Exclusion condition exists when greater than 70 degrees but snow/ice flag set up to 85 degrees)										bit(s)		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	
QF3_VIIRSTEDR	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)	0	0	100	percent	No		unsigned 8-bit char	Name Value	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, Generalized UML Diagram for HDF5 IP/ARP/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
+QF3_VIIRSSTEDR : 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 retrieved pixels with one or more exclusion or degradation 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	<p>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.</p> <p>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.</p> <p>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 C₁ and C₂ are constants derived from minimizing feedback and errors from soil and atmospheric effects. For VIIRS, C₁ = 6, C₂ = 7.5, and L=1.</p> <p>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</p> <p>The M3 band has twice the cell size as the I1 and I2 bands, so its value is applied to the 4 horizontal cells.</p> <p>Availability Conditions: Day Clear Land</p> <p>Sensors: VIIRS</p> <p>Effectivity: NPP and NPOESS</p>
File-Naming	See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.

Construct	
File Size	Estimated Data Granule Sizes: 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 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	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	1	unitless	Yes	TOA_NDVI_Factors	unsigned 16-bit integer	Name	Value		
										NA_UINT16_FILL	65535		
										MISS_UINT16_FILL	65534		
										ONBOARD_PT_UINT16_FILL	65533		
										ONGROUND_PT_UINT16_FILL	65532		
ERR_UINT16_FILL	65531												
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	4	unitless	Yes	TOC_EVI_Factors	unsigned 16-bit integer	Name	Value		
										NA_UINT16_FILL	65535		
										MISS_UINT16_FILL	65534		
										ONBOARD_PT_UINT16_FILL	65533		
										ONGROUND_PT_UINT16_FILL	65532		
ERR_UINT16_FILL	65531												
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									
		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size					
QF1_VIIRSVIEDR	1byte(s)	AlongTrack	Yes	No	1536	1536					
		CrossTrack	No	No	6400	6400					
		Datum									
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
		Overall NDVI Quality	0			unitless	No		1 bit(s)	Name Value	Name Value Low 0 High 1
		Overall EVI Quality	1			unitless	No		1 bit(s)	Name Value	Name Value Low 0 High 1
		I1 TOA Reflectance is NOT available	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		I2 TOA Reflectance is NOT available	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		I1 Surface Reflectance is NOT available	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		I2 Surface Reflectance is NOT available	5			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
M3 Surface Reflectance is NOT available	6			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
EVI Range is out of range (EVI < -1.0 or EVI > 4.0)	7			unitless	No		1 bit(s)	Name Value	Name Value 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 Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		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 (70 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	Data Type	Fill Values	Legend Entries

		Scale = First Array Element; 0 Offset = 2nd Array Element			unitless	No		32-bit floating	Name Value	Name Value
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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, Generalized UML Diagram for HDF5 IP/ARP/EDR Files, for a complete UML rendering of this product.

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

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 retrieved pixels with one or more exclusion or degradation criteria flags	
NDVI Exclusion Summary	0 – 100	Percent of retrieved pixels with one or more exclusion or degradation 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.

Availability Conditions	Day Night Clear Ocean
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)
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Description/ Purpose	<p>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.</p> <p>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.</p> <p>The skin temperature is retrieved directly from the satellite radiances and the bulk temperature is derived from the skin.</p> <p>Availability Conditions:</p> <ul style="list-style-type: none"> Day Night Clear Ocean <p>Sensors:</p> <ul style="list-style-type: none"> VIIRS <p>Effectivity: NPP and NPOESS</p>
File-Naming Construct	<p>See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.</p>
File Size	<p>Estimated Data Granule Sizes: 18.8 MiB</p> <p>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.</p>
File Format Type	<p>HDF5</p>

Data Content and Data Format	<p>See Section 5.5.1.2.1, VIIRS Sea Surface Temperature EDR Data Content Summary</p> <p>See Section 5.5.1.2.2, VIIRS Sea Surface Temperature EDR Product Profile</p> <p>See Section 5.5.1.2.3, VIIRS Sea Surface Temperature EDR HDF5 Details</p> <p>See Section 5.5.1.2.4, VIIRS Sea Surface Temperature EDR Metadata Details</p> <p>See Section 5.5.1.2.5, VIIRS Sea Surface Temperature EDR Geolocation Details</p>
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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	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	271.0	313.0	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	271.0	313.0	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	0		
										Split Window			
										Triple Window	1		
Day/Night	7			unitless	No		1 bit(s)	Name	Value	Name	Value		
										Night	0		
										Day	1		

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		
Bad LWIR SDR (SST not retrieved due to poor quality or non-availability of M15 or M16 SDRs)	0			unitless	No		1 bit(s)	Name Value	Name	Value	
									Both Available	0	
									At Least One Not Available	1	
Bad SWIR SDR (Single Split Window algorithm used due to poor quality or non-availability of M12 or M13 SDRs)	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
											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 > 50.3 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, Generalized UML Diagram for HDF5 IP/ARP/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 Skin SST retrievals with High Quality	EDFCB4-TBR-10502
Bulk Summary Quality	0 – 100	Percent of Bulk SST retrievals with High Quality	EDFCB4-TBR-10502
Skin Degraded Summary	0 – 100	Percent of Skin SST retrievals with Degraded Quality	EDFCB4-TBR-10502
Bulk Degraded Summary	0 – 100	Percent of Bulk SST retrievals with Degraded Quality	EDFCB4-TBR-10502
Skin Exclusion Summary	0 – 100	Percent of retrieved pixels with one or more exclusion or degradation criteria flags	
Bulk Exclusion Summary	0 – 100	Percent of retrieved pixels with one or more exclusion or degradation criteria flags	

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.”

Availability	Day
Conditions	Night
	Clear
	Ocean
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

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. For VIIRS Ice Surface Temperature, Solar Zenith Angles > 80° define nighttime conditions.
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.
File Size	Estimated Data Granule Sizes: 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 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	Granule Dimension	Units
IceSurfaceTemperature	Ice Surface Temperature	unsigned 16-bit integer	[N*768, 3200]	[768, 3200]	kelvin
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	213.0	275.0	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)	<table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>2-Band Split Window</td> <td>0</td> <td>Single Band (12-micrometer) Retrieval</td> <td>1</td> </tr> </tbody> </table>	Name	Value	Name	Value	2-Band Split Window	0	Single Band (12-micrometer) Retrieval	1																																													
Name	Value	Name	Value																																																												
2-Band Split Window	0	Single Band (12-micrometer) Retrieval	1																																																												
		Day/Night	3			unitless	No		1 bit(s)	<table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Night (Solar Zenith Angle > 85 Degrees)</td> <td>0</td> <td>Day (Solar Zenith Angle <= 85 degrees)</td> <td>1</td> </tr> </tbody> </table>	Name	Value	Name	Value	Night (Solar Zenith Angle > 85 Degrees)	0	Day (Solar Zenith Angle <= 85 degrees)	1																																													
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)	<table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>False</td> <td>0</td> <td>True</td> <td>1</td> </tr> </tbody> </table>	Name	Value	Name	Value	False	0	True	1																																													
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)	<table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>False</td> <td>0</td> <td>True</td> <td>1</td> </tr> </tbody> </table>	Name	Value	Name	Value	False	0	True	1																																													
Name	Value	Name	Value																																																												
False	0	True	1																																																												
		Fire detected in pixel	6			unitless	No		1 bit(s)	<table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>False</td> <td>0</td> <td>True</td> <td>1</td> </tr> </tbody> </table>	Name	Value	Name	Value	False	0	True	1																																													
Name	Value	Name	Value																																																												
False	0	True	1																																																												
		Pixel is outside of Ice Coverage Zone (Ice Coverage Zone is defined to be: Latitude is North of 36N or Latitude is South of 50S)	7			unitless	No		1 bit(s)	<table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>False</td> <td>0</td> <td>True</td> <td>1</td> </tr> </tbody> </table>	Name	Value	Name	Value	False	0	True	1																																													
Name	Value	Name	Value																																																												
False	0	True	1																																																												
QF2_VIIRSISTEDR	1byte(s)	<table border="1"> <thead> <tr> <th>Name</th> <th>Granule Boundary</th> <th>Dynamic</th> <th>Min Array Size</th> <th>Max Array Size</th> </tr> </thead> <tbody> <tr> <td>AlongTrack</td> <td>Yes</td> <td>No</td> <td>768</td> <td>768</td> </tr> <tr> <td>CrossTrack</td> <td>No</td> <td>No</td> <td>3200</td> <td>3200</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="10">Datum</th> </tr> <tr> <th>Description</th> <th>Datum Offset</th> <th>Unscaled Valid Range Min</th> <th>Unscaled Valid Range Max</th> <th>Measurement Units</th> <th>Scaled</th> <th>Scale Factor Name</th> <th>Data Type</th> <th>Fill Values</th> <th>Legend Entries</th> </tr> </thead> <tbody> <tr> <td>Ice Fraction</td> <td>0</td> <td></td> <td></td> <td>unitless</td> <td>No</td> <td></td> <td>2 bit(s)</td> <td> <table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Ice Fraction = 1.00</td> <td>0</td> <td>0.95 <= Ice Fraction < 1.00</td> <td>1</td> </tr> </tbody> </table> </td> <td></td> </tr> </tbody> </table>									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 Fraction	0			unitless	No		2 bit(s)	<table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Ice Fraction = 1.00</td> <td>0</td> <td>0.95 <= Ice Fraction < 1.00</td> <td>1</td> </tr> </tbody> </table>	Name	Value	Name	Value	Ice Fraction = 1.00	0	0.95 <= Ice Fraction < 1.00	1	
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 Fraction	0			unitless	No		2 bit(s)	<table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Ice Fraction = 1.00</td> <td>0</td> <td>0.95 <= Ice Fraction < 1.00</td> <td>1</td> </tr> </tbody> </table>	Name	Value	Name	Value	Ice Fraction = 1.00	0	0.95 <= Ice Fraction < 1.00	1																																															
Name	Value	Name	Value																																																												
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)	Name Value	Name Confidently Clear	Value 0
											Probably Clear	1
											Probably Cloudy	2
											Confidently Cloudy	3
		Adjacent Pixel Cloud Confidence Indicator	4			unitless	No		2 bit(s)	Name Value	Name Confidently Clear	Value 0
											Probably Clear	1
											Probably Cloudy	2
											Confidently Cloudy	3
		Exclusion - Thin Cirrus Detected by Solar Band	6			unitless	No		1 bit(s)	Name Value	Name False	Value 0
											True	1
		Spare	7			unitless	No		1 bit(s)	Name Value	Name Value	
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 Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries	
		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 Land and Desert	Value 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 False	Value 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, Generalized UML Diagram for HDF5 IP/ARP/EDR Files, for a complete UML rendering of this product.

VIIRS-IST-EDR
+IceSurfaceTemperature : H5T_NATIVE_USHORT
+QF1_VIIRSISTEDR : H5T_NATIVE_UCHAR
+QF2_VIIRSISTEDR : H5T_NATIVE_UCHAR
+QF3_VIIRSISTEDR : H5T_NATIVE_UCHAR
+ISTFactors : H5T_NATIVE_FLOAT

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 retrieved pixels within granule with high quality of retrieval	
SDR Input Data Quality	0 – 100	Percent of pixels with high quality input values of brightness temperature in VIIRS SDR	

N_Quality_Summary			
Name	Value	Description	Notes
Exclusion Summary	0 – 100	Percent of retrieved pixels with excluded conditions	
Summary Range Check	0 – 100	Percent of retrieved pixels outside of expected range (213K to 275K)	
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	
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	<p>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.</p> <p>Availability Conditions:</p> <p>Day Night Clear Ocean</p> <p>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.</p> <p>Sensors: VIIRS</p> <p>Effectivity: NPP and NPOESS</p>
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.
File Size	<p>Data Granule Size: 0.7 MiB</p> <p>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.</p> <p>Geolocation Granule Size: 0.39 MiB</p>
File Format Type	HDF5

Data Content and Data Format	<p>For each aggregated area, the Net Heat Flux EDR contains:</p> <ul style="list-style-type: none">Net Heat FluxLatent and Sensible Heat FluxesLongwave and Shortwave FluxesNumber of pixels in cell (total, clear, water, and ice)Quality Flags <p>Associated Geolocation fields for this EDR are also listed</p> <ul style="list-style-type: none">See Section 5.5.4.1, Net Heat Flux Data Content SummarySee Section 5.5.4.2 Net Heat Flux Product ProfileSee Section 5.5.4.3, Net Heat Flux HDF5 DetailsSee Section 5.5.4.4 Net Heat Flux HDF5 MetadataSee Section 5.5.4.5, Net Heat Flux Geolocation DetailsSee Section 5.5.4.6, Net Heat Flux Geolocation Product ProfileSee Section 5.5.4.7, Net Heat Flux Geolocation HDF5 DetailsSee Section 5.5.4.8, Net Heat Flux Geolocation HDF5 Metadata Details
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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	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 surfaces	32-bit floating point	[N*48, 254]	[48, 254]	W/m^2
SensibleHeatFlux_Ice	Sensible heat flux (positive = transfer from	32-bit floating point	[N*48, 254]	[48, 254]	W/m^2

Name	Description	Data Type	Aggregate Dimension	Granule Dimension	Units
	surface to atmosphere) from ice surfaces				
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 (nClear)	16-bit integer	[N*48, 254]	[48, 254]	pixels
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

Name	Description	Data Type	Aggregate Dimension	Granule Dimension	Units
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	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										ELINT_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3				
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	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										ELINT_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3				

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 Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries																
		Total net heat flux (positive = transfer from surface to atmosphere) from ice surfaces.	0	-2000	2000	W/m^2	No		32-bit floating point	<table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>NA_FLOAT32_FILL</td> <td>-999.9</td> </tr> <tr> <td>MISS_FLOAT32_FILL</td> <td>-999.8</td> </tr> <tr> <td>ERR_FLOAT32_FILL</td> <td>-999.5</td> </tr> <tr> <td>ELINT_FLOAT32_FILL</td> <td>-999.4</td> </tr> <tr> <td>VDNE_FLOAT32_FILL</td> <td>-999.3</td> </tr> </tbody> </table>	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	<table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	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																										
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	<table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>NA_FLOAT32_FILL</td> <td>-999.9</td> </tr> <tr> <td>MISS_FLOAT32_FILL</td> <td>-999.8</td> </tr> <tr> <td>ERR_FLOAT32_FILL</td> <td>-999.5</td> </tr> <tr> <td>ELINT_FLOAT32_FILL</td> <td>-999.4</td> </tr> <tr> <td>VDNE_FLOAT32_FILL</td> <td>-999.3</td> </tr> </tbody> </table>	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	<table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	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																										
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	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												
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 Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries		
		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	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												

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	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												
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	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												

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 Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries			
		Longwave flux (positive = transfer from surface to atmosphere) from ice surfaces	0	-2000	2000	W/m^2	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													
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	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													

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	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											
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	Name Value
										NA_INT16_FILL	-999	
										MISS_INT16_FILL	-998	
										ERR_INT16_FILL	-995	
										ELINT_INT16_FILL	-994	
VDNE_INT16_FILL	-993											
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	Name Value
										NA_INT16_FILL	-999	
										MISS_INT16_FILL	-998	
										ERR_INT16_FILL	-995	
										ELINT_INT16_FILL	-994	
VDNE_INT16_FILL	-993											

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	Name Value
										NA_INT16_FILL	-999	
										MISS_INT16_FILL	-998	
										ERR_INT16_FILL	-995	
										ELINT_INT16_FILL	-994	
								VDNE_INT16_FILL	-993			
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 (nIce)	0			pixels	No		16-bit integer	Name	Value	Name Value
										NA_INT16_FILL	-999	
										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
-------------	------------------	-------------------

Name	Attribute Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size	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			
AlongTrack	N_Rows	Yes	No	48	48															
CrossTrack	N_Columns	No	No	254	254															
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 (missing data)	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 (missing data)	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 (missing data)	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 (missing data)	3

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 (missing data)	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 (missing data)	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 (missing data)	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		

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 Input Quality (Indicates the quality of the Aerosol Optical Thickness input value)	0			unitless	No		2 bit(s)	Name	Value	Name	Value
										Available (from VIIRS AOT)	0
										Climatology	1
										Exclusion (missing data)	2
										Not Used	3
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)	0
										Cloudy	1
										Land	2
										Not Used	3

		Sun Glint detected in horizontal cell (Average sun glint in horizontal cell < 36 degrees – AOT and APSP cannot be determined)	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		
												CMIS	0		
												NWP	1		
												Exclusion (> 25 m/s)	2		
												Not Used	3		
		Exclusion: AOT > 1.0 (AOT in horizontal cell > 1.0 on the slant path (AOT @550nm))	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		

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, Generalized UML Diagram for HDF5 IP/ARP/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 retrieved pixels within this granule with a high quality of retrieval	
Exclusion Summary	0 – 100%	Percent of pixels 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 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	<p>For each aggregated area, the Net Heat Flux Geolocation contains:</p> <ul style="list-style-type: none"> Time Fields Geolocation Angular Fields Height and Satellite Range Spacecraft Position, Velocity, and Attitude Spacecraft Solar Zenith and Azimuth Angles Geolocation Quality Flags <p>See Section 5.5.4.5, Net Heat Flux Geolocation Data Content Summary</p> <p>See Section 5.5.4.6, Net Heat Flux Geolocation Product Profile</p> <p>See Section 5.5.4.7, Net Heat Flux Geolocation HDF5 Details</p> <p>See Section 5.5.4.8, Net Heat Flux Geolocation HDF5 Metadata Details</p>

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

Name	Description	Data Type	Aggregate Dimension	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	Ellipsoid-Geoid separation	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
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

Name	Description	Data Type	Aggregate Dimension	Granule Dimension	Units
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 EDFCB4-TBR-10496
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 Data Content 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	-90	90	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			
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	-180	180	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	0	180	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	-180	180	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	0	180	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	-180	180	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	
		Ellipsoid-Geoid separation	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	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			
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	Name Value
										NA_FLOAT32_FILL	-999.9	
										MISS_FLOAT32_FILL	-999.8	
										ERR_FLOAT32_FILL	-999.5	
										VDNE_FLOAT32_FILL	-999.3	

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	<table border="1"> <tr> <td>Name</td> <td>Value</td> <td>Name</td> <td>Value</td> </tr> <tr> <td>NA_FLOAT32_FILL</td> <td>-999.9</td> <td></td> <td></td> </tr> <tr> <td>MISS_FLOAT32_FILL</td> <td>-999.8</td> <td></td> <td></td> </tr> <tr> <td>ERR_FLOAT32_FILL</td> <td>-999.5</td> <td></td> <td></td> </tr> <tr> <td>VDNE_FLOAT32_FILL</td> <td>-999.3</td> <td></td> <td></td> </tr> </table>	Name	Value	Name	Value	NA_FLOAT32_FILL	-999.9			MISS_FLOAT32_FILL	-999.8			ERR_FLOAT32_FILL	-999.5			VDNE_FLOAT32_FILL	-999.3			
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VDNE_FLOAT32_FILL	-999.3																														
SCAttitude	4byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size																									
		Scan	Yes	No	48	48																									
		GRFCoordinate	No	No	3	3																									
		Datum																													
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries																				
		Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at the midtime of scan	0			arcsecond EDFCB4-TBR-10496	No		32-bit floating point	<table border="1"> <tr> <td>Name</td> <td>Value</td> <td>Name</td> <td>Value</td> </tr> <tr> <td>NA_FLOAT32_FILL</td> <td>-999.9</td> <td></td> <td></td> </tr> <tr> <td>MISS_FLOAT32_FILL</td> <td>-999.8</td> <td></td> <td></td> </tr> <tr> <td>ERR_FLOAT32_FILL</td> <td>-999.5</td> <td></td> <td></td> </tr> <tr> <td>VDNE_FLOAT32_FILL</td> <td>-999.3</td> <td></td> <td></td> </tr> </table>	Name	Value	Name	Value	NA_FLOAT32_FILL	-999.9			MISS_FLOAT32_FILL	-999.8			ERR_FLOAT32_FILL	-999.5			VDNE_FLOAT32_FILL	-999.3			
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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																		
		The angle from the normal vector of the Solar Diffuser surface (z-axis of the solar diffuser frame) to the solar vector	0	0	180	degree	No		32-bit floating point	<table border="1"> <tr> <td>Name</td> <td>Value</td> <td>Name</td> <td>Value</td> </tr> <tr> <td>NA_FLOAT32_FILL</td> <td>-999.9</td> <td></td> <td></td> </tr> <tr> <td>MISS_FLOAT32_FILL</td> <td>-999.8</td> <td></td> <td></td> </tr> <tr> <td>ERR_FLOAT32_FILL</td> <td>-999.5</td> <td></td> <td></td> </tr> <tr> <td>VDNE_FLOAT32_FILL</td> <td>-999.3</td> <td></td> <td></td> </tr> </table>	Name	Value	Name	Value	NA_FLOAT32_FILL	-999.9			MISS_FLOAT32_FILL	-999.8			ERR_FLOAT32_FILL	-999.5			VDNE_FLOAT32_FILL	-999.3			
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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														
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	-180	180	degree	No		32-bit floating point	<table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>NA_FLOAT32_FILL</td> <td>-999.9</td> </tr> <tr> <td>MISS_FLOAT32_FILL</td> <td>-999.8</td> </tr> <tr> <td>ERR_FLOAT32_FILL</td> <td>-999.5</td> </tr> <tr> <td>VDNE_FLOAT32_FILL</td> <td>-999.3</td> </tr> </tbody> </table>	Name	Value	NA_FLOAT32_FILL	-999.9	MISS_FLOAT32_FILL	-999.8	ERR_FLOAT32_FILL	-999.5	VDNE_FLOAT32_FILL	-999.3	<table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	Name	Value		
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MISS_FLOAT32_FILL	-999.8																							
ERR_FLOAT32_FILL	-999.5																							
VDNE_FLOAT32_FILL	-999.3																							
Name	Value																							

Table 5.5.4.6-2, Net Heat Flux Geolocation Data Content Summary – 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 Impulse Flag (Indicates whether the number of encoder pulse values per delta time is as expected (Good Data) or not (Bad Data))	2			unitless	No		1 bit(s)	Name	Value	Name	Value
										Good Data	0		
										Bad Data	1		
Within South Atlantic Anomaly	3			unitless	No		1 bit(s)	Name	Value	Name	Value		
										False	0		
										True	1		
Solar Eclipse during Earth view scan	4			unitless	No		1 bit(s)	Name	Value	Name	Value		
										False	0		
										True	1		
Spare	5			unitless	No		3 bit(s)	Name	Value	Name	Value		

QF2_VIIRSNHFGEO	1byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size						
		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)	0			unitless	No		1 bit(s)	Name Value	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	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	Name Value
									False 0	True 1		
Invalid Solar Angles	3			unitless	No		1 bit(s)	Name Value	Name Value	Name Value		
									False 0	True 1		
Spare	4			unitless	No		4 bit(s)	Name Value	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
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	
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.	

5.5.5 Ocean Color/Chlorophyll

Data Mnemonic	EDRE-VROC-C0030 (Official) EDRE-VROC-C0031 (Substitute)
Description/ Purpose	<p>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 nL_w values.</p> <p>Normalized water-leaving radiances are measured in $W\ m^{-2}\ \mu m^{-1}\ sr^{-1}$</p> <p>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 $mg\ m^{-3}$.</p> <p>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.</p> <p>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.</p> <p>Availability Conditions:</p> <ul style="list-style-type: none"> Day Clear Ocean <p>Sensors:</p> <ul style="list-style-type: none"> VIIRS <p>Effectivity: NPP and NPOESS</p>
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.
File Size	<p>Estimated Data Granule Sizes: 166.4 MiB</p> <p>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.</p>
File Format Type	HDF5
Data Content	See Section 5.5.5.1, VIIRS Ocean Color Chlorophyll Data

and Data Format	<p>Content Summary</p> <p>See Section 5.5.5.2, VIIRS Ocean Color Chlorophyll Product Profile</p> <p>See Section 5.5.5.3, VIIRS Ocean Color Chlorophyll HDF5 Details</p> <p>See Section 5.5.5.4, VIIRS Ocean Color Chlorophyll Metadata Details</p> <p>See Section 5.5.5.5, VIIRS Ocean Color Chlorophyll Geolocation Details</p>
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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	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

Name	Description	Data Type	Aggregate Dimension	Granule Dimension	Units
IOP_s_488nm	Inherent Optical Properties – Backscattering at 488nm	32-bit floating point	[N*768, 3200]	[768, 3200]	m ⁻¹
IOP_s_555nm	Inherent Optical Properties - Backscattering at 555nm	32-bit floating point	[N*768, 3200]	[768, 3200]	m ⁻¹
IOP_s_672nm	Inherent Optical Properties - Backscattering at 672nm	32-bit floating point	[N*768, 3200]	[768, 3200]	m ⁻¹
nLw_412nm	Normalized Water Leaving Radiance at 412nm	32-bit floating point	[N*768, 3200]	[768, 3200]	W/(m ² 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 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 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												
IOP_a_488nm	4byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size							
		AlongTrack	Yes	No	768	768							
		CrossTrack	No	No	3200	3200							
		Datum											
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		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												

IOP_a_555nm	4byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size							
		AlongTrack	Yes	No	768	768							
		CrossTrack	No	No	3200	3200							
		Datum											
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		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												
IOP_a_672nm	4byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size							
		AlongTrack	Yes	No	768	768							
		CrossTrack	No	No	3200	3200							
		Datum											
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		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	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_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	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_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	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			

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	
		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)	Name Value	Name Value	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_VIIRSOCEDR	1byte(s)	<table border="1"> <thead> <tr> <th>Name</th> <th>Granule Boundary</th> <th>Dynamic</th> <th>Min Array Size</th> <th>Max Array Size</th> </tr> </thead> <tbody> <tr> <td>AlongTrack</td> <td>Yes</td> <td>No</td> <td>768</td> <td>768</td> </tr> <tr> <td>CrossTrack</td> <td>No</td> <td>No</td> <td>3200</td> <td>3200</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="11">Datum</th> </tr> <tr> <th>Description</th> <th>Datum Offset</th> <th>Unscaled Valid Range Min</th> <th>Unscaled Valid Range Max</th> <th>Measurement Units</th> <th>Scaled</th> <th>Scale Factor Name</th> <th>Data Type</th> <th>Fill Values</th> <th>Legend Entries</th> </tr> </thead> <tbody> <tr> <td>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".</td> <td>0</td> <td></td> <td></td> <td>unitless</td> <td>No</td> <td></td> <td>1 bit(s)</td> <td>Name Value</td> <td>Name Value</td> <td>Good 0 Poor 1</td> </tr> <tr> <td>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".</td> <td>1</td> <td></td> <td></td> <td>unitless</td> <td>No</td> <td></td> <td>1 bit(s)</td> <td>Name Value</td> <td>Name Value</td> <td>Good 0 Poor 1</td> </tr> </tbody> </table>												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
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		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																																													
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		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																																													
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		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																																													
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		QF3_VIIRSOCEDR	1byte(s)	<table border="1"> <thead> <tr> <th>Name</th> <th>Granule Boundary</th> <th>Dynamic</th> <th>Min Array Size</th> <th>Max Array Size</th> </tr> </thead> <tbody> <tr> <td>AlongTrack</td> <td>Yes</td> <td>No</td> <td>768</td> <td>768</td> </tr> <tr> <td>CrossTrack</td> <td>No</td> <td>No</td> <td>3200</td> <td>3200</td> </tr> </tbody> </table>					Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size	AlongTrack	Yes	No	768	768	CrossTrack	No	No	3200	3200	<table border="1"> <thead> <tr> <th colspan="10">Datum</th> </tr> <tr> <th>Description</th> <th>Datum Offset</th> <th>Unscaled Valid Range Min</th> <th>Unscaled Valid Range Max</th> <th>Measurement Units</th> <th>Scaled</th> <th>Scale Factor Name</th> <th>Data Type</th> <th>Fill Values</th> <th>Legend Entries</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>							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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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_VIIRSOCEDR	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 > 50.3 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	5			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
		Adjacent Pixel is not confidently clear (as determined by the VIIRS Cloud Mask)	2			unitless	No		1 bit(s)	Name Value	Name Value
		Thin Cirrus Cloud Detected in Pixel as determined by the VIIRS Cloud Mask	3			unitless	No		1 bit(s)	Name Value	Name Value
		Exclusion: Cloud Shadow detected in Pixel (as determined by the VIIRS Cloud Mask)	4			unitless	No		1 bit(s)	Name Value	Name Value
		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
		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
		Exclusion: AOT > 0.3 (AOT in horizontal cell > 0.3 on the slant path (AOT @550nm))	7			unitless	No		1 bit(s)	Name Value	Name Value
QF6_VIIRSOCEDR	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) > 0.012)	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_VIIRSOCEDR	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) are out of range (nLw < 0.1 or nLw > 40 W/m^2 micrometer sr)	0			unitless	No		1 bit(s)	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 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 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
	Spare	6			unitless	No		2 bit(s)	Name Value	Name Value	

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, Generalized UML Diagram for HDF5 IP/ARP/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 M1 (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)	
Overall IOP-a Quality at M2 (445nm)	0 – 100	Percent of high quality IOP-a (Inherent Optical Properties – Absorption) retrievals at M2 (445nm)	
Overall IOP-a Quality at M3 (488nm)	0 – 100	Percent of high quality IOP-a (Inherent Optical Properties – Absorption) retrievals at M3 (488nm)	
Overall IOP-a Quality at M4 (555nm)	0 – 100	Percent of high quality IOP-a (Inherent Optical Properties – Absorption) retrievals at M4 (555nm)	
Overall IOP-a Quality at M5 (672nm)	0 – 100	Percent of high quality IOP-a (Inherent Optical Properties – Absorption) retrievals at M5 (672nm)	

N_Quality_Summary			
Name	Value	Description	Notes
Overall IOP-s Quality at M1 (412nm)	0 – 100	Percent of high quality IOP-s (Inherent Optical Properties – Backscattering) retrievals at M1 (412nm)	
Overall IOP-s Quality at M2 (445nm)	0 – 100	Percent of high quality IOP-s (Inherent Optical Properties – Backscattering) retrievals at M2 (445nm)	
Overall IOP-s Quality at M3 (488nm)	0 – 100	Percent of high quality IOP-s (Inherent Optical Properties – Backscattering) retrievals at M3 (488nm)	
Overall IOP-s Quality at M4 (555nm)	0 – 100	Percent of high quality IOP-s (Inherent Optical Properties – Backscattering) retrievals at M4 (555nm)	
Overall IOP-s Quality at M5 (672nm)	0 – 100	Percent of high quality IOP-s (Inherent Optical Properties – Backscattering) retrievals at M5 (672nm)	
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 – 100	Granule contains no ocean coverage	

5.5.6 DELETED

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.

5.5.7.1 DELETED

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. Availability Conditions: <ul style="list-style-type: none"> Day Clear Ocean Sensors: <ul style="list-style-type: none"> VIIRS Effectivity: NPP and NPOESS
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.4 for details.
File Size	Estimated Data Granule Sizes: 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 Metadata Details See Section 5.5.7.2.5, VIIRS Sea Ice Characterization Geolocation Data Content Summary See Section 5.5.7.2.6, VIIRS Sea Ice Characterization Geolocation Product Profile See Section 5.5.7.2.7, VIIRS Sea Ice Characterization

	<p>Geolocation HDF5 Details</p> <p>See Section 5.5.7.2.8, VIIRS Sea Ice Characterization Geolocation Metadata Details</p>
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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	Granule Dimension	Units
IceAgeWeight	Ice Age Weighting Factors derived from Ice Age LUT and scene conditions (fire, clouds, sunglint, I-Band quality, etc.)	32-bit floating point	[N*768, 3200]	[768, 3200]	unitless
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)	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 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	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													
IceAge	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	
		Various classifications of ice for I1, I2, Surface Temperature IP, and weighted cell total	0			unitless	No		unsigned 8-bit char	Name	Value	Name	Value	
										NA_UINT8_FILL	255	Unclassified	0	
										MISS_UINT8_FILL	254	Water	1	
										ONBOARD_PT_UINT8_FILL	253	New or Young Ice	2	
										ONGROUND_PT_UINT8_FILL	252	New or Young Ice	3	
ERR_UINT8_FILL	251									First Year Ice	4			
ELINT_UINT8_FILL	250									Land Fill	10			
ELINT_UINT8_FILL	249									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		
		Ice Age Overall Quality	0			unitless	No		2 bit(s)	Name	Value	Name	Value
												Green (good quality)	0
												Yellow (degraded quality)	1
												Red (bad quality)	2
				No Retrieval (Fill)	3								
Input SDR & Surface Temperature IP Quality	2			unitless	No		1bit(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										
Thermal Contrast Degradation: 1.5K < Thermal contrast < 2.2K	5			unitless	No		1 bit(s)	Name	Value	Name	Value		
										False	0		
										True	1		

		Sea Ice Valid Region Exclusion: Pixel is outside of valid region. Valid region is > +36 (36N) latitude OR < -50 (50S) latitude (Valid Region must also be over ocean)	6			unitless	No		1 bit(s)	Name Value	Name Value	False 0	True 1
		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, Generalized UML Diagram for HDF5 IP/ARP/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 retrieved horizontal cells within granule with high quality of retrieval	
Exclusion Summary	0 – 100	Percent of retrieved horizontal cells in exclusion conditions, including “no ice” horizontal cells	
Exclusion – No Ocean Coverage	0	Ocean in horizontal cell	
	1	No Ocean in horizontal cell	
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)	

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