Joint Polar Satellite System (JPSS) Ground Project
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Goddard Space Flight Center
Greenbelt, Maryland

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Joint Polar Satellite System (JPSS) Algorithm Specification
Volume II: Data Dictionary for the Cloud Physical Properties
JPSS Review/Approval Page

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Greenbelt, Maryland

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Preface

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Any questions should be addressed to:

JPSS Configuration Management Office
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1 Introduction

1.1 Scope

The Joint Polar Satellite System (JPSS) Algorithm Specification for Cloud Physical Properties - Volume II: Data Dictionary contains the specifications for the format of the Cloud Physical Properties Intermediate Products (IPs) and Environmental Data Records (EDRs). This specification includes the format of the Hierarchical Data Format Release 5 (HDF5) files, as well as the product definitions. These formats are available to external users of the JPSS. For an overview of the data product formats, see 474-00001-01, JPSS CDFCB-X Vol I. For an overview of the metadata formats for data products, see 474-00448-02-01, JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms.

1.2 Organization

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<td>Section 7</td>
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</tr>
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2 Related Documentation

The latest JPSS documents can be obtained from URL: https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm. JPSS Project documents have a document number starting with 470, 472 or 474 indicating the governing Configuration Control Board (CCB) (Program, Flight, or Ground) that has the control authority of the document.

2.1 Parent Documents

The following reference document(s) is (are) the Parent Document(s) from which this document has been derived. Any modification to a Parent Document will be reviewed to identify the impact upon this document. In the event of a conflict between a Parent Document and the content of this document, the JPSS Program Configuration Change Board has the final authority for conflict resolution.

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2.2 Applicable Documents

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2.3 Information Documents

The following documents are referenced herein and amplify or clarify the information presented in this document. These documents are not binding on the content of this document.

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3 UML for HDF5 Products

The following paragraphs describe the structure and contents of the IP and EDR granules formed by the JPSS ground processing software.

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

Figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, depicts the HDF5 IP/EDR organization as a Unified Modeling Language (UML) class diagram. Each HDF5 IP/EDR file contains an HDF5 Root Group, ‘/’, a Data Products Group, Product Groups (Collection Short Name), an optional Geolocation Group (depending upon packaging option, see the JPSS CDFCB-X Vol. I, for a description of the geolocation packaging), and an All Data Group (dataset arrays). The Product Groups and Geolocation Group both contain datasets - an Aggregation Dataset (Collection Short Name_Agg) and Granule Datasets (Collection Short Name_Gran_n) - where n indicates the nth granule in a temporal aggregation of granules (0 .. n-1). A granule is a general term used to describe the minimum quanta of data collected per processing period, generally on the order of seconds. For the definition and organization of the metadata attributes contained in the HDF5 files, see the JPSS -Algorithm Specification Volume II: Data Dictionary for the Common Algorithms. Attributes that are specific to a particular IP/EDR are listed with the specific IP/EDR’s data format definition. For the generalized formats and packaging options for the Geolocation data, see the JPSS CDFCB-X Vol. I - Overview.
The inclusion of the N_GEO_Ref and the GEO Group is dependent on the existence of a separate geolocation product. If applicable, then either the N_GEO_Ref or the GEO Group will be included based on the Packaging Option selected by the IDP requestor. These elements are mutually exclusive.

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

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
3.2 Intermediate Products, Application Related Products and Environmental Data Records HDF5 Details - Dynamically Sized

Figure 3.2-1, Generalized UML Diagram for dynamically sized HDF5 IP/EDR Files, depicts the HDF5 IP/EDR organization as a Unified Modeling Language (UML) class diagram for products that contain dynamically sized fields. Dynamically sized means that a field’s length will vary from granule to granule. The organization of the HDF5 file is identical to the statically sized HDF5 file with the exception of the aggregation and corresponding All_Data group. For statically sized products, the object ID stored in the aggregation array points to a Dataset_Array under the All_Data group. This Dataset_Array is a single HDF5 dataset for each field. This single HDF5 dataset contains all the data for all granules in the file for a given field. However, for dynamically sized products, the object ID stored in the aggregation array points to an HDF5 group instead. This HDF5 group contains one or more datasets - a separate dataset for each granule for a given field. The dataset is named “Dataset_Array_Gran_n”.
Figure: 3.2-1 Generalized UML Diagram for dynamically sized HDF5 IP/EDR Files

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify this is the correct version prior to use.
4 Intermediate Products (IPs)

IPs are defined as a data subset or retrieval by-product that is required within another primary data product’s generation sequence or is used as an input to secondary processing or analysis. The IPs defined here can be packaged and delivered to the end-user. Other IPs are generated during the creation of EDRs but are not deliverable and are thus not documented here.

4.1 VIIRS Cloud Base Height IP Format

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>IMPI_VCBH_R0100 (Official)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IMPI_VCBH_R0110 (Substitute)</td>
</tr>
<tr>
<td>Description/Purpose</td>
<td>Moderate Resolution Pixel Level Cloud Base Height Information</td>
</tr>
<tr>
<td>File-Naming Construct</td>
<td>See the JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.0 for details.</td>
</tr>
<tr>
<td>File Size</td>
<td>See Table: 4.1.1-1 VIIRS Cloud Base Height Data Content Summary for size.</td>
</tr>
<tr>
<td>File Format Type</td>
<td>HDF5</td>
</tr>
<tr>
<td>Production Frequency</td>
<td>As requested</td>
</tr>
<tr>
<td>Data Content and Data Format</td>
<td>This IP contains the datasets with the described formatting as shown in the following product profile tables</td>
</tr>
<tr>
<td></td>
<td>See Section 4.1.1 VIIRS Cloud Base Height IP Content Summary</td>
</tr>
<tr>
<td></td>
<td>See Section 4.1.2 VIIRS Cloud Base Height IP Product Profile</td>
</tr>
<tr>
<td></td>
<td>See Section 4.1.3 VIIRS Cloud Base Height IP HDF5 Details</td>
</tr>
<tr>
<td></td>
<td>See Section 4.1.4 VIIRS Cloud Base Height IP Metadata Details</td>
</tr>
<tr>
<td></td>
<td>See Section 4.1.5 VIIRS Cloud Base Height IP Geolocation Details</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
4.1.1 VIIRS Cloud Base Height Data Content Summary

Table: 4.1.1-1 VIIRS Cloud Base Height Data Content Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Data Type</th>
<th>Aggregate Dimensions (N = Number of Granules)</th>
<th>Granule Dimensions</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>cbh</td>
<td>Cloud Base Height</td>
<td>32-bit floating point</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>kilometers</td>
</tr>
<tr>
<td>QF_VIIRSCBHIP</td>
<td>Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>Unitless</td>
</tr>
</tbody>
</table>

File Size 12,288,000 Bytes

4.1.2 VIIRS Cloud Base Height IP Product Profile

Table: 4.1.2-1 VIIRS Cloud Base Height IP Product Profile

VIIRS-CBH-IP Product Profile

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
<th>Fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>cbh</td>
<td>4 bytes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
<th>Fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>M_VIIRS_SDR_ROWS</td>
<td>Yes</td>
<td>No</td>
<td>768</td>
</tr>
<tr>
<td>M_VIIRS_SDR_COLS</td>
<td>No</td>
<td>No</td>
<td>3200</td>
</tr>
</tbody>
</table>

Datum Description

- Cloud Base Height
  - Name: cbh
  - Data Type: 32-bit floating point
  - Aggregate Dimensions: [N*768, 3200]
  - Granule Dimensions: [768, 3200]
  - Units: kilometers

File Size 12,288,000 Bytes

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Spare</td>
<td>3</td>
<td>MIN VAL</td>
<td>MAX VAL</td>
<td>Unlabeled</td>
<td>No</td>
</tr>
</tbody>
</table>
4.1.3 VIIRS Cloud Base Height IP HDF5 Details

Figure 4.1.3-1 provides the details on the content and data types of the VIIRS Cloud Base Height IP products. These UML diagrams provide details at the product level only. In addition to these UML diagrams, refer to figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>Description/Purpose</th>
<th>File-Naming Construct</th>
<th>File Size</th>
<th>Production Frequency</th>
<th>Data Content and Data Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMPL_VICC_R0100 (Official)</td>
<td>Moderate Resolution Pixel Level Cloud Layer and Type information. The cloud layer numbers represent the layer number in which any cloud is present for each pixel in the granule. The cloud layer type values represent the type of cloud layer that is present for each pixel in the granule. Effectivity: S-NPP/JPSS</td>
<td>See the JPSS CDFCB-X Vol. I, 474-000001-01, Section 3.0 for details.</td>
<td>See Table: 4.2.1 VIIRS Cloud Layer-Type Data Content Summary for size. This granule size includes output related fields and quality flags only. Geolocation and metadata attributes are not included. Additional size added by HDF5 packaging is also not included.</td>
<td>As requested</td>
<td>This IP contains the datasets with the described formatting as shown in the following product profile tables See Section 4.2.1 VIIRS Cloud Layer-Type IP Content Summary</td>
</tr>
<tr>
<td>IMPL_VICC_R0110 (Substitute)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure: 4.1.3-1 VIIRS Cloud Base Height IP UML Diagram

4.1.4 VIIRS Cloud Base Height IP Metadata Details

The product metadata elements contained in the VIIRS Cloud Base Height IP are listed in 474-00448-02-01, JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms, Sections 4 and 5. These metadata elements include all common metadata at the root, product, aggregation, and granule level.

There are no granule level Quality Flags defined as metadata elements in the VIIRS Cloud Base Height IP. Therefore, there are no entries in the N_Quality_Summary_Name/Value metadata attributes for this product.

4.1.5 VIIRS Cloud Base Height IP Geolocation Details

See 474-00448-02-06 JPSS Algorithm Specification Vol II: Data Dictionary for VIIRS RDR/SDR, Section 6.2.65, VIIRS M-Band SDR Geolocation for VIIRS Cloud Base Height IP Geolocation details.

4.2 VIIRS Cloud Layer-Type IP Format

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
See Section 4.2.2 VIIRS Cloud Layer-Type IP Product Profile
See Section 4.2.3 VIIRS Cloud Layer-Type IP HDF5 Details
See Section 4.2.4 VIIRS Cloud Layer-Type IP Metadata Details
See Section 4.2.5 VIIRS Cloud Layer-Type IP Geolocation Details
### 4.2.1 VIIRS Cloud Layer-Type Data Content Summary

Table: 4.2.1-1 VIIRS Cloud Layer-Type Data Content Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Data Type</th>
<th>Aggregate Dimensions (N = Number of Granules)</th>
<th>Granule Dimensions</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>cloudLayer</td>
<td>Cloud Layer</td>
<td>unsigned 8-bit char</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>Unitless</td>
</tr>
<tr>
<td>cloudType</td>
<td>Cloud Type Identification</td>
<td>unsigned 8-bit char</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>Unitless</td>
</tr>
<tr>
<td>QF_VIIRSCDLAYERTYPEIP</td>
<td>Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>Unitless</td>
</tr>
</tbody>
</table>

File Size: 7,372,800 Bytes

### 4.2.2 VIIRS Cloud Layer-Type IP Product Profile

Table: 4.2.2-1 VIIRS Cloud Layer-Type IP Product Profile

VIIRS-CCL-PIX-IP Product Profile

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
<th>Granule Boundary Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>cloudLayer_1byte(s)</td>
<td>Name</td>
<td>Granule Boundary Dynamic</td>
<td>Min Array Size</td>
<td>Max Array Size</td>
<td></td>
</tr>
<tr>
<td>M_VIIRS_SDR_ROWS</td>
<td>Yes</td>
<td>No</td>
<td>768</td>
<td>768</td>
<td></td>
</tr>
<tr>
<td>M_VIIRS_SDR_COLS</td>
<td>No</td>
<td>No</td>
<td>3200</td>
<td>3200</td>
<td></td>
</tr>
<tr>
<td>cloudType_1byte(s)</td>
<td>Name</td>
<td>Granule Boundary Dynamic</td>
<td>Min Array Size</td>
<td>Max Array Size</td>
<td></td>
</tr>
<tr>
<td>M_VIIRS_SDR_ROWS</td>
<td>Yes</td>
<td>No</td>
<td>768</td>
<td>768</td>
<td></td>
</tr>
<tr>
<td>M_VIIRS_SDR_COLS</td>
<td>No</td>
<td>No</td>
<td>3200</td>
<td>3200</td>
<td></td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
## VIIRS-CCL-PIX-IP Product Profile - Quality Flags

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
<th>Granule Boundary</th>
<th>Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
<th>Datum Offset</th>
<th>Unscaled Valid Range Min</th>
<th>Unscaled Valid Range Max</th>
<th>Measurement Units</th>
<th>Scale Factor Name</th>
<th>Data Type Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>QP_VIIRSCDLAYERTYPEIP</td>
<td>1 byte(s)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M_VIIRS_SDR_ROWS</td>
<td>Yes</td>
<td>No</td>
<td>768</td>
<td>No</td>
<td>768</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M_VIIRS_SDR_COLS</td>
<td>No</td>
<td>No</td>
<td>3200</td>
<td>No</td>
<td>3200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Cloud confidence
- **Description:** Cloud confidence
- **Datum Offset:** 0
- **Unscaled Valid Range Min:** 0
- **Unscaled Valid Range Max:** 3
- **Measurement Units:** Unitless
- **Scale Factor Name:** No
- **Data Type Fill Values:** 2 bit(s)
- **Legend Entries:**
  - CONF_CLEAR: 0
  - PROB_CLOUDY: 3

### Surface type
- **Description:** Surface type
- **Datum Offset:** 0
- **Unscaled Valid Range Min:** 2
- **Unscaled Valid Range Max:** 5
- **Measurement Units:** Unitless
- **Scale Factor Name:** No
- **Data Type Fill Values:** 3 bit(s)
- **Legend Entries:**
  - land desert: 0
  - land not desert: 1
  - inland water: 2
  - sea water: 3
  - coastal: 5

### Sunglint
- **Description:** Sunglint
- **Datum Offset:** 0
- **Unscaled Valid Range Min:** 5
- **Unscaled Valid Range Max:** 1
- **Measurement Units:** Unitless
- **Scale Factor Name:** No
- **Data Type Fill Values:** 1 bit(s)
- **Legend Entries:**
  - not in sunglint: 0

### Snow/ice surface
- **Description:** Snow/ice surface
- **Datum Offset:** 0
- **Unscaled Valid Range Min:** 6
- **Unscaled Valid Range Max:** 1
- **Measurement Units:** Unitless
- **Scale Factor Name:** No
- **Data Type Fill Values:** 1 bit(s)
- **Legend Entries:**
  - not: 0
  - snow/ice: 1

### Spare
- **Description:** Spare
- **Datum Offset:** 0
- **Unscaled Valid Range Min:** 7
- **Unscaled Valid Range Max:** 1
- **Measurement Units:** Unitless
- **Scale Factor Name:** No
- **Data Type Fill Values:** 1 bit(s)
- **Legend Entries:**

---

Check the JPSS MIS Server at [https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm](https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm) to verify that this is the correct version prior to use.
4.2.3 VIIRS Cloud Layer-Type IP HDF5 Details

Figure 4.2.3-1 provides the details on the content and data types of the VIIRS Cloud Layer-Type IP products. These UML diagrams provide details at the product level only. In addition to these UML diagrams, refer to figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

<table>
<thead>
<tr>
<th>VIIRS-Cd-Layer-Type-IP</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>+QF_VIIRSCDLAYERTYPEIP : H5T_NATIVE_UCHAR</td>
<td></td>
</tr>
<tr>
<td>+cloudLayer : H5T_NATIVE_UCHAR</td>
<td></td>
</tr>
<tr>
<td>+cloudType : H5T_NATIVE_UCHAR</td>
<td></td>
</tr>
</tbody>
</table>

Figure: 4.2.3-1 VIIRS Cloud Layer-Type IP UML Diagram

4.2.4 VIIRS Cloud Layer-Type IP Metadata Details

The product metadata elements contained in the VIIRS Cloud Layer-Type IP are listed in 474-00448-02-01, JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms, Sections 4 and 5. These metadata elements include all common metadata at the root, product, aggregation, and granule level in the HDF5 file.

There are no granule level Quality Flags defined as metadata elements in the VIIRS Cloud Layer-Type IP. Therefore, there are no entries in the N_Quality_Summary_Name/Value metadata attributes for this product.

4.2.5 VIIRS Cloud Layer-Type IP Geolocation Details

See 474-00448-02-06, JPSS Algorithm Specification Vol II: Data Dictionary for VIIRS RDR/SDR, Section 6.2.65, VIIRS M-Band SDR Geolocation for VIIRS Cloud Layer-Type IP Geolocation details.

4.3 VIIRS Cloud Cover-Type IP Format

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>IMPL_VCLT_R0100 (Official)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IMPL_VCLT_R0110 (Substitute)</td>
</tr>
<tr>
<td>Description/Purpose</td>
<td>6km x 6km HC Level Fractional Cloud Cover Information for each Layer. Cloud cover values represent the cloud fractional coverage present for each layer in each horizontal cell (HC) in the granule and the total cloud coverage for each HC in the granule. Effectivity: S-NPP/JPSS</td>
</tr>
<tr>
<td>File-Naming Construct</td>
<td>See the JPSS CDFCB-X Vol. I, 474-000001-01, Section 3.0 for details.</td>
</tr>
<tr>
<td>File Size</td>
<td>Data Granule Size: 1,170,432 bytes per granule This granule size includes output related fields and quality flags only. Geolocation and metadata attributes are not included. Additional size added by HDF5 packaging is also not included.</td>
</tr>
<tr>
<td>File Format Type</td>
<td>HDF5</td>
</tr>
<tr>
<td>Production Frequency</td>
<td>As requested</td>
</tr>
<tr>
<td>Data Content and Data Format</td>
<td>This IP contains the datasets with the described formatting as shown in the following product profile tables</td>
</tr>
</tbody>
</table>
See Section 4.3.1 VIIRS Cloud Cover-Type IP Content Summary
See Section 4.3.2 VIIRS Cloud Cover-Type IP Product Profile
See Section 4.3.3 VIIRS Cloud Cover-Type IP HDF5 Details
See Section 4.3.4 VIIRS Cloud Cover-Type IP Metadata Details
See Section 4.3.5 VIIRS Cloud Cover-Type IP Geolocation Details
4.3.1 VIIRS Cloud Cover-Type Data Content Summary

Table: 4.3.1-1 VIIRS Cloud Cover-Type Data Content Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Data Type</th>
<th>Aggregate Dimensions (N = Number of Granules)</th>
<th>Granule Dimensions</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>layerCloudCover</td>
<td>Layer Cloud Cover Cell</td>
<td>32-bit floating point</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>Unitless</td>
</tr>
<tr>
<td>totalCloudCover</td>
<td>Total Cloud Cover Cell</td>
<td>32-bit floating point</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>Unitless</td>
</tr>
<tr>
<td>cloudType</td>
<td>Cloud Types</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>Unitless</td>
</tr>
</tbody>
</table>

File Size: 1,170,432 Bytes

4.3.2 VIIRS Cloud Cover-Type IP Product Profile

Table: 4.3.2-1 VIIRS Cloud Cover-Type IP Product Profile

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size/Dimensions</th>
<th>Granule Boundary</th>
<th>Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>layerCloudCover</td>
<td>4 byte(s)</td>
<td>Granule Boundary</td>
<td>Dynamic</td>
<td>Min Array Size</td>
<td>Max Array Size</td>
</tr>
<tr>
<td>VIIRS_CLD_HC_ROWS</td>
<td>Yes</td>
<td>No</td>
<td>96</td>
<td>96</td>
<td></td>
</tr>
<tr>
<td>VIIRS_CLD_HC_COLS</td>
<td>No</td>
<td>No</td>
<td>508</td>
<td>508</td>
<td></td>
</tr>
<tr>
<td>VIIRS_CLD_LYRS</td>
<td>No</td>
<td>No</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Datum Description | Datum Offset | Unscaled Valid Range Min | Unscaled Valid Range Max | Measurement Units | Scale Factor Name | Data Type | Fill Values | Legend Entries |
<table>
<thead>
<tr>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Layer Cloud Cover Cell</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>Unltd</td>
<td>No</td>
<td>32-bit floating point</td>
<td>NA_FLOAT32_FILL</td>
<td>-999.9</td>
</tr>
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<td>ONBOARD_PT_FLOAT32_FILL</td>
<td>-999.7</td>
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<td>ONGROUND_PT_FLOAT32_FILL</td>
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<td>MISS_FLOAT32_FILL</td>
<td>-999.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ONBOARD_PT_FLOAT32_FILL</td>
<td>-999.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ONGROUND_PT_FLOAT32_FILL</td>
<td>-999.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ERR_FLOAT32_FILL</td>
<td>-999.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ELLIPSOID_FLOAT32_FILL</td>
<td>-999.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VDNE_FLOAT32_FILL</td>
<td>-999.3</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### Cloud Types

<table>
<thead>
<tr>
<th>cloudType (byte)</th>
<th>Name</th>
<th>Granule Boundary Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VIIRS_CLD_HC_ROWS</td>
<td>No</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>VIIRS_CLD_HC_COLS</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
<tr>
<td></td>
<td>VIIRS_CLD_LYRS</td>
<td>No</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

### Datum

<table>
<thead>
<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>Cloud Types</td>
<td>0</td>
<td>1</td>
<td>8</td>
<td>Unitless</td>
<td>No</td>
<td>unsigned 8-bit char</td>
<td></td>
<td>Name</td>
<td>Value</td>
</tr>
<tr>
<td></td>
<td>Stratus</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>unsigned 8-bit char</td>
<td>NA_UINT8_FILL</td>
<td>255</td>
</tr>
<tr>
<td></td>
<td>Alto Cumulus</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>unsigned 8-bit char</td>
<td>MISS_UINT8_FILL</td>
<td>254</td>
</tr>
<tr>
<td></td>
<td>Cumulus</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>unsigned 8-bit char</td>
<td>ONGROUND_PT_UINT8_FILL</td>
<td>253</td>
</tr>
<tr>
<td></td>
<td>Cirrus</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>unsigned 8-bit char</td>
<td>ERR_UINT8_FILL</td>
<td>252</td>
</tr>
<tr>
<td></td>
<td>Cirrus Cumulus</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>unsigned 8-bit char</td>
<td>ELLIPSOI UINT8_FILL</td>
<td>251</td>
</tr>
<tr>
<td></td>
<td>VDNE_UINT8_FILL</td>
<td>249</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>unsigned 8-bit char</td>
<td>SOUT_UINT8_FILL</td>
<td>248</td>
</tr>
</tbody>
</table>
4.3.3 VIIRS Cloud Cover-Type IP HDF5 Details

Figure 4.3.3-1 provides the details on the content and data types of the VIIRS Cloud Cover-Type IP products. These UML diagrams provide details at the product level only. In addition to these UML diagrams, refer to figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

<table>
<thead>
<tr>
<th>VIIRS-Cd-Cov-Type-IP</th>
</tr>
</thead>
<tbody>
<tr>
<td>+cloudType : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+layerCloudCover : H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+totalCloudCover : H5T_NATIVE_FLOAT</td>
</tr>
</tbody>
</table>

Figure: 4.3.3-1 VIIRS Cloud Cover-Type IP UML Diagram

4.3.4 VIIRS Cloud Cover-Type IP Metadata Details

The product metadata elements contained in the VIIRS Cloud Cover-Type IP are listed in 474-00448-02-01, JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms, Sections 4 and 5. These metadata elements include all common metadata at the root, product, aggregation, and granule level.

There are no granule level Quality Flags defined as metadata elements in the VIIRS Cloud Cover-Type IP. Therefore, there are no entries in the N_Quality_Summary_Name/Value metadata attributes for this product.

4.3.5 VIIRS Cloud Cover-Type IP Geolocation Details

VIIRS Cloud Cover-Type IP uses the VIIRS Cloud Aggregation Geolocation. See section 4.8 for geolocation details.

4.4 VIIRS Cloud Top Parameters IP Format

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>IMPL_VCTP_R0100 (Official) IMPL_VCTP_R0110 (Substitute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description/Purpose</td>
<td>Cloud Top Temperature, Pressure, and Height for each VIIRS Moderate Resolution Pixel. Effectivity: S-NPP/JPSS</td>
</tr>
<tr>
<td>File-Naming Construct</td>
<td>See the JPSS CDFCB-X Vol. I, 474-000001-01, Section 3.0 for details.</td>
</tr>
<tr>
<td>File Size</td>
<td>See Table: 4.4.1-1 VIIRS Cloud Top Parameters Data Content Summary for size. This granule size includes output related fields and quality flags only. Geolocation and metadata attributes are not included. Additional size added by HDF5 packaging is also not included.</td>
</tr>
<tr>
<td>File Format Type</td>
<td>HDF5</td>
</tr>
<tr>
<td>Production Frequency</td>
<td>As requested</td>
</tr>
<tr>
<td>Data Content and Data Format</td>
<td>See Section 4.4.1 VIIRS Cloud Top Parameters IP Content Summary See Section 4.4.2 VIIRS Cloud Top Parameters IP Product Profile See Section 4.4.3 VIIRS Cloud Top Parameters IP HDF5 Details See Section 4.4.4 VIIRS Cloud Top Parameters IP Metadata Details</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
See Section 4.4.5 VIIRS Cloud Top Parameters IP Geolocation Details

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
4.4.1 VIIRS Cloud Top Parameters Data Content Summary

Table: 4.4.1-1 VIIRS Cloud Top Parameters Data Content Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Data Type</th>
<th>Aggregate Dimensions (N = Number of Granules)</th>
<th>Granule Dimensions</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ctt</td>
<td>Cloud top Temperature</td>
<td>32-bit floating point</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>Kelvin</td>
</tr>
<tr>
<td>cth</td>
<td>Cloud Top Height</td>
<td>32-bit floating point</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>km</td>
</tr>
<tr>
<td>ctp</td>
<td>Cloud Top Pressure</td>
<td>32-bit floating point</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>mbar</td>
</tr>
<tr>
<td>QF1_VIIRSCTPIP</td>
<td>Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>Unitless</td>
</tr>
<tr>
<td>QF2_VIIRSCTPIP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QF3_VIIRSCTPIP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

File Size 36,864,000 Bytes

4.4.2 VIIRS Cloud Top Parameters IP Product Profile

Table: 4.4.2-1 VIIRS Cloud Top Parameters IP Product Profile

VIIRS-CTP-IP Product Profile

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
<th>Granule Boundary</th>
<th>Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
<th>Fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>ctt</td>
<td>4byte(s)</td>
<td>Name</td>
<td>Granule Boundary</td>
<td>Dynamic</td>
<td>Min Array Size</td>
<td>Max Array Size</td>
<td>Fields</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name</td>
<td>Granule Boundary</td>
<td>Dynamic</td>
<td>Min Array Size</td>
<td>Max Array Size</td>
<td>Fields</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name</td>
<td>Granule Boundary</td>
<td>Dynamic</td>
<td>Min Array Size</td>
<td>Max Array Size</td>
<td>Fields</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### VIIRS-CTP-IP Product Profile - Quality Flags

**Fields**

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>QF1_VIIRSCTPIP</td>
<td>1 byte(s)</td>
<td>Name</td>
</tr>
<tr>
<td>M_VIIRS_SDR_ROWS</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>M_VIIRS_SDR_COLS</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

**Datum**

<table>
<thead>
<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>Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud Top Pressure</td>
<td>0</td>
<td>0</td>
<td>1050</td>
<td>bar</td>
<td>No</td>
<td>32-bit floating point</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cloud phase</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>Unitless</td>
<td>No</td>
<td>3 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Surface type</td>
<td>2</td>
<td>0</td>
<td>5</td>
<td>Unitless</td>
<td>No</td>
<td>3 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Sunglint</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>Unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Check if out of range (50-1050 mb)</td>
<td>6</td>
<td>0</td>
<td>1</td>
<td>Unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Snow/ice surface</td>
<td>7</td>
<td>0</td>
<td>1</td>
<td>Unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
</tbody>
</table>

**QF2_VIIRSCTPIP**

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>M_VIIRS_SDR_ROWS</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>M_VIIRS_SDR_COLS</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

**Datum**

<table>
<thead>
<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>Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud phase</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>Unitless</td>
<td>No</td>
<td>3 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
4.4.3 VIIRS Cloud Top Parameters IP HDF5 Details

Figure 4.4.3-1 provides the details on the content and data types of the VIIRS Cloud Top Parameters IP products. These UML diagrams provide details at the product level only. In addition to these UML diagrams, refer to figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

```
<table>
<thead>
<tr>
<th>VIIRS-Cd-Top-Parm-IP</th>
</tr>
</thead>
<tbody>
<tr>
<td>+QF1_VIIRSCTPIP : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF2_VIIRSCTPIP : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF3_VIIRSCTPIP : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+ctt : H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+cht : H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+ctp : H5T_NATIVE_FLOAT</td>
</tr>
</tbody>
</table>
```

Figure: 4.4.3-1 VIIRS Cloud Top Parameters IP UML Diagram

4.4.4 VIIRS Cloud Top Parameters IP Metadata Details

The product metadata elements contained in the VIIRS Cloud Top Parameters IP are listed in 474-00448-02-01, JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms, Section 4 and 5. These metadata elements include all common metadata at the root, product, aggregation, and granule level.

There are no granule level Quality Flags defined as metadata elements in the VIIRS Cloud Top Parameters IP. Therefore, there are no entries in the N_Quality_Summary_Name/Value metadata attributes for this product.

4.4.5 VIIRS Cloud Top Parameters IP Geolocation Details


4.5 VIIRS Parallax Corrected Cloud Mask IP Format

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>IMPL_VPCM_R0100 (Official)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IMPL_VPCM_R0110 (Substitute)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description/ Purpose</th>
<th>Parallax Corrected Cloud Mask data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This format for this IP is identical to the format of the delivered Cloud Mask IP. (Note that the content of the flags will be different, however, between the parallax corrected and non-parallax corrected Cloud Mask IPs). Format details are in the JPSS Algorithm Specification Vol II: Data Dictionary for Cloud Mask, 474-00448-02-11. Note: The Collection Shortname for the VIIRS Parallax Corrected Cloud Mask IP is: VIIRS-Parx-Corr-CM-IP</td>
</tr>
<tr>
<td></td>
<td>All field names and HDF5 data types in the UML diagram in the JPSS Algorithm Specification Vol II: Data Dictionary for Cloud Mask, 474-00448-02-11, Figure 5.1.3.3-1, are applicable to the VIIRS Parallax Corrected Cloud Mask IP. Effectivity: S-NPP/JPSS</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

<table>
<thead>
<tr>
<th>File-Naming Construct</th>
<th>See the JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.0 for details.</th>
</tr>
</thead>
<tbody>
<tr>
<td>File Size</td>
<td>See the JPSS Algorithm Specification Vol II: Data Dictionary for Cloud Mask, 474-00448-02-11</td>
</tr>
<tr>
<td>File Format Type</td>
<td>HDF5</td>
</tr>
<tr>
<td>Production Frequency</td>
<td>As requested</td>
</tr>
<tr>
<td>Data Content and Data Format</td>
<td>See Section 4.5.1 VIIRS Parallax Corrected Cloud Mask Properties IP Content Summary</td>
</tr>
<tr>
<td></td>
<td>See Section 4.5.2 VIIRS Parallax Corrected Cloud Mask Properties IP Product Profile</td>
</tr>
<tr>
<td></td>
<td>See Section 4.5.3 VIIRS Parallax Corrected Cloud Mask Properties IP HDF5 Details</td>
</tr>
<tr>
<td></td>
<td>See Section 4.5.4 VIIRS Parallax Corrected Cloud Mask Properties IP Metadata Details</td>
</tr>
<tr>
<td></td>
<td>See Section 4.5.5 VIIRS Parallax Corrected Cloud Mask Properties IP Geolocation Details</td>
</tr>
</tbody>
</table>
### 4.5.1 VIIRS Parallax Corrected Cloud Mask Data Content Summary

Table: 4.5.1-1 VIIRS Parallax Corrected Cloud Mask Properties Data Content

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Data Type</th>
<th>Aggregate Dimensions (N = Number of Granules)</th>
<th>Granule Dimensions</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>QF1_VIIRSCMIP</td>
<td>Cloud Mask EDR Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>Unitless</td>
</tr>
<tr>
<td>QF2_VIIRSCMIP</td>
<td></td>
<td>unsigned 8-bit char</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>Unitless</td>
</tr>
<tr>
<td>QF3_VIIRSCMIP</td>
<td></td>
<td>unsigned 8-bit char</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>Unitless</td>
</tr>
<tr>
<td>QF4_VIIRSCMIP</td>
<td></td>
<td>unsigned 8-bit char</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>Unitless</td>
</tr>
<tr>
<td>QF5_VIIRSCMIP</td>
<td></td>
<td>unsigned 8-bit char</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>Unitless</td>
</tr>
<tr>
<td>QF6_VIIRSCMIP</td>
<td></td>
<td>unsigned 8-bit char</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>Unitless</td>
</tr>
<tr>
<td>ScanAllOcean</td>
<td>Scan All Ocean Flag - one value per scan per M-Band detector</td>
<td>unsigned 8-bit char</td>
<td>[N*768]</td>
<td>[768]</td>
<td>Unitless</td>
</tr>
<tr>
<td>ScanNoOcean</td>
<td>Scan No Ocean Flag - one value per scan per M-Band detector</td>
<td>unsigned 8-bit char</td>
<td>[N*768]</td>
<td>[768]</td>
<td>Unitless</td>
</tr>
<tr>
<td>GranuleAllOcean</td>
<td>Granule All Ocean Flag</td>
<td>unsigned 8-bit char</td>
<td>[N*1]</td>
<td>[1]</td>
<td>Unitless</td>
</tr>
<tr>
<td>GranuleNoOcean</td>
<td>Granule No Ocean Flag</td>
<td>unsigned 8-bit char</td>
<td>[N*1]</td>
<td>[1]</td>
<td>Unitless</td>
</tr>
</tbody>
</table>

File Size: 14,747,138 Bytes

### 4.5.2 VIIRS Parallax-corrected Cloud Mask Properties IP Product Profile

Table: 4.5.2-1 VIIRS Parallax-corrected Cloud Mask Properties IP Product Profile

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size Dimensions</th>
<th>Fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>QF1_VIIRSCMIP</td>
<td>Byte(s)</td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Granule Boundary</td>
<td>Dynamic</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Datum Description</th>
<th>Datum Offset</th>
<th>Unscaled Valid Range Min</th>
<th>Unscaled Valid Range Max</th>
<th>Measurement Units</th>
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#### Snow/Ice Surface Pixel

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<td>Snow/Ice</td>
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#### Sun Glint Pixel

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#### Datum Description

- **Land/Water Background Pixel**
  - Unscaled Valid Range Min: 0
  - Unscaled Valid Range Max: 5
  - Measurement Units: Unitless
  - Scale Factor Name: No
  - Data Type: 3 bit(s)
  - Legend Entries:
    - Land and Desert: 0
    - Land No Desert: 1
    - Inland Water: 2
    - Sea Water: 3
    - Coastal: 5

- **Shadow Detected Pixel**
  - Unscaled Valid Range Min: 0
  - Unscaled Valid Range Max: 1
  - Measurement Units: Unitless
  - Scale Factor Name: No
  - Data Type: 1 bit(s)
  - Legend Entries:
    - No: 0
    - Yes: 1

- **Non Cloud Obstruction (Heavy Aerosol)**
  - Unscaled Valid Range Min: 0
  - Unscaled Valid Range Max: 1
  - Measurement Units: Unitless
  - Scale Factor Name: No
  - Data Type: 1 bit(s)
  - Legend Entries:
    - No: 0
    - Yes: 1

- **Fire Detected (Cloud Mask)**
  - Unscaled Valid Range Min: 0
  - Unscaled Valid Range Max: 1
  - Measurement Units: Unitless
  - Scale Factor Name: No
  - Data Type: 1 bit(s)
  - Legend Entries:
    - No: 0
    - Yes: 1

- **Cirrus (Solar RM9)**
  - Unscaled Valid Range Min: 0
  - Unscaled Valid Range Max: 1
  - Measurement Units: Unitless
  - Scale Factor Name: No
  - Data Type: 1 bit(s)
  - Legend Entries:
    - No Cloud: 0
    - Cloud: 1

- **Cirrus IR**
  - Unscaled Valid Range Min: 0
  - Unscaled Valid Range Max: 1
  - Measurement Units: Unitless
  - Scale Factor Name: No
  - Data Type: 1 bit(s)
  - Legend Entries:
    - No Cloud: 0
    - Cloud: 1

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#### Datum Description

- **IR Threshold Cloud Test (BTM15) Pixel**
  - Unscaled Valid Range Min: 0
  - Unscaled Valid Range Max: 1
  - Measurement Units: Unitless
  - Scale Factor Name: No
  - Data Type: 1 bit(s)
  - Legend Entries:
    - No Cloud: 0
    - Cloud: 1

- **High Cloud (BTM12-BTM16) Test Pixel**
  - Unscaled Valid Range Min: 0
  - Unscaled Valid Range Max: 1
  - Measurement Units: Unitless
  - Scale Factor Name: No
  - Data Type: 1 bit(s)
  - Legend Entries:
    - No Cloud: 0
    - Cloud: 1

- **IR Temperature Difference Test (BTM14-BTM15 and BTM15-BTM16) Pixel**
  - Unscaled Valid Range Min: 0
  - Unscaled Valid Range Max: 1
  - Measurement Units: Unitless
  - Scale Factor Name: No
  - Data Type: 1 bit(s)
  - Legend Entries:
    - No Cloud: 0

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ScanAllOcean

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<td>ELLIPSOID_UINT8_FILL</td>
<td>250</td>
</tr>
<tr>
<td>VDNE_UINT8_FILL</td>
<td>249</td>
</tr>
<tr>
<td>SOUB_UINT8_FILL</td>
<td>248</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
4.5.3 VIIRS Parallax Corrected Cloud Mask Properties IP HDF5 Details

Figure 4.5.3-1 provides the details on the content and data types of the VIIRS Parallax Corrected Cloud Mask Properties products. These UML diagrams provide details at the product level only. In addition to these UML diagrams, refer to figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

<table>
<thead>
<tr>
<th>VIIRS-Parx-Corr-CM-IP</th>
</tr>
</thead>
<tbody>
<tr>
<td>+GranuleAllOcean : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+GranuleNoOcean : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF1_VIIRSCMIP : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF2_VIIRSCMIP : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF3_VIIRSCMIP : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF4_VIIRSCMIP : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF5_VIIRSCMIP : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF6_VIIRSCMIP : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+ScanAllOcean : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+ScanNoOcean : H5T_NATIVE_UCHAR</td>
</tr>
</tbody>
</table>

Figure: 4.5.3-1 VIIRS Parallax Corrected Cloud Mask Properties IP UML Diagram

4.5.4 VIIRS Parallax Corrected Cloud Mask Properties IP Metadata Details

The product metadata elements contained in the VIIRS Parallax Corrected Cloud Mask Properties IP are listed in 474-00448-02-01, JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms, Sections 4 and 5. These metadata elements include all common metadata at the root, product, aggregation, and granule level.

There are no granule level Quality Flags defined as metadata elements in the VIIRS Parallax Corrected Cloud Optical Properties IP. Therefore, there are no entries in the N_Quality_Summary_Name/Value metadata attributes for this product.

4.5.5 VIIRS Parallax Corrected Cloud Mask Properties IP Geolocation Details


4.6 VIIRS Parallax Corrected Cloud Optical Properties IP Format

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>Description/Purpose</th>
<th>File-Naming Construct</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMPI_VPCP_R0110 (Substitute)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>File Size</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>See Table: 4.6.1-1 VIIRS Parallax Corrected Cloud Optical Properties Data Content Summary for size. This granule size includes output related fields and quality flags only. Geolocation and metadata attributes are not included. Additional size added by HDF5 packaging is also not included.</td>
<td></td>
</tr>
<tr>
<td>File Format Type</td>
<td>HDF5</td>
</tr>
<tr>
<td>------------------</td>
<td>------</td>
</tr>
<tr>
<td>Production Frequency</td>
<td>As requested</td>
</tr>
</tbody>
</table>
| Data Content and Data Format | See Section 4.6.1 VIIRS Parallax Corrected Cloud Optical Properties IP Content Summary  
See Section 4.6.2 VIIRS Parallax Corrected Cloud Optical Properties IP Product Profile  
See Section 4.6.3 VIIRS Parallax Corrected Cloud Optical Properties IP HDF5 Details  
See Section 4.6.4 VIIRS Parallax Corrected Cloud Optical Properties IP Metadata Details  
See Section 4.6.5 VIIRS Parallax Corrected Cloud Optical Properties IP Geolocation Details |

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### 4.6.1 VIIRS Parallax Corrected Cloud Optical Properties Data Content Summary

**Table: 4.6.1-1 VIIRS Parallax Corrected Cloud Optical Properties Data Content Summary**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Data Type</th>
<th>Aggregate Dimensions (N = Number of Granules)</th>
<th>Granule Dimensions</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>cot</td>
<td>Cloud Optical Thickness</td>
<td>32-bit floating point</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>micrometers</td>
</tr>
<tr>
<td>eps</td>
<td>Effective Particle Size</td>
<td>32-bit floating point</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>micrometers</td>
</tr>
<tr>
<td>QF1_VIIRSCOPIP</td>
<td>Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*768, 3200]</td>
<td>[768, 3200]</td>
<td>Unitless</td>
</tr>
<tr>
<td>QF2_VIIRSCOPIP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QF3_VIIRSCOPIP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

File Size: 27,033,600 Bytes

### 4.6.2 VIIRS Parallax-corrected Cloud Optical Properties IP Product Profile

**Table: 4.6.2-1 VIIRS Parallax-corrected Cloud Optical Properties IP Product Profile**

**VIIRS-CORR-COP-IP Product Profile**

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
<th>Granule Boundary</th>
<th>Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>cot</td>
<td>4byte(s)</td>
<td></td>
<td>M_VIIRS_SDR_ROWS</td>
<td>Yes</td>
<td>768</td>
<td>768</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>M_VIIRS_SDR_COLS</td>
<td>No</td>
<td>3200</td>
<td>3200</td>
</tr>
</tbody>
</table>

**Datum**

<table>
<thead>
<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>Cloud Optical Thickness</td>
<td>3</td>
<td>30</td>
<td>30</td>
<td>micrometers</td>
<td>No</td>
<td>32-bit floating point</td>
<td></td>
<td>NA_FLOAT32_FILL</td>
<td></td>
</tr>
</tbody>
</table>

**eps**

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
<th>Granule Boundary</th>
<th>Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4byte(s)</td>
<td></td>
<td>M_VIIRS_SDR_ROWS</td>
<td>Yes</td>
<td>768</td>
<td>768</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>M_VIIRS_SDR_COLS</td>
<td>No</td>
<td>3200</td>
<td>3200</td>
</tr>
</tbody>
</table>

**Datum**

<table>
<thead>
<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>Effective Particle Size</td>
<td>3</td>
<td>30</td>
<td>50</td>
<td>micrometers</td>
<td>No</td>
<td>32-bit floating point</td>
<td></td>
<td>NA_FLOAT32_FILL</td>
<td></td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpsmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
## VIIRS-CORR-COP-IP Product Profile - Quality Flags

### Fields

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
<th>Granule Boundary</th>
<th>Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>QF1_VIIRSCOPIP</td>
<td>1 byte(s)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M_VIIRS_SDR_ROWS</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td>768</td>
<td>768</td>
</tr>
<tr>
<td>M_VIIRS_SDR_COLS</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
<td>3200</td>
<td>3200</td>
</tr>
</tbody>
</table>

### Datum

<table>
<thead>
<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 Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Pixel level flag</td>
<td>0</td>
<td>1</td>
<td></td>
<td>Unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>cop quality flag is set</td>
</tr>
<tr>
<td>Ice COT out of bounds</td>
<td>1</td>
<td>1</td>
<td></td>
<td>Unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>out of bounds</td>
</tr>
<tr>
<td>Water COT out of bounds</td>
<td>2</td>
<td>1</td>
<td></td>
<td>Unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>out of bounds</td>
</tr>
<tr>
<td>Ice EPS out of bounds</td>
<td>3</td>
<td>1</td>
<td></td>
<td>Unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>out of bounds</td>
</tr>
<tr>
<td>Water EPS out of bounds</td>
<td>4</td>
<td>1</td>
<td></td>
<td>Unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>out of bounds</td>
</tr>
<tr>
<td>Cloud phase</td>
<td>5</td>
<td>5</td>
<td></td>
<td>Unitless</td>
<td>No</td>
<td>3 bit(s)</td>
<td>Name/Value</td>
<td>not exec, Cirrus: 1, Opaque ice: 2, water: 3, mixed: 4, multiple layer: 5</td>
</tr>
</tbody>
</table>

### QF2_VIIRSCOPIP

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
<th>Granule Boundary</th>
<th>Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>M_VIIRS_SDR_ROWS</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td>768</td>
<td>768</td>
</tr>
<tr>
<td>M_VIIRS_SDR_COLS</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
<td>3200</td>
<td>3200</td>
</tr>
</tbody>
</table>

### Datum

<table>
<thead>
<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 Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day water iteration convergence</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>Unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>convergence</td>
</tr>
<tr>
<td>Day ice iteration convergence</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>Unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>convergence</td>
</tr>
<tr>
<td>Water COT &lt; 1 at daytime</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>Unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>yes</td>
</tr>
<tr>
<td>Ice COT &lt; 1 at daytime</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>Unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>yes</td>
</tr>
<tr>
<td>Water COT &lt; 1 at nighttime</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>Unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>yes</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### Ice COT < 1 at nighttime

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unitless</th>
<th>Yes</th>
<th>No</th>
<th>1 bit(s)</th>
<th>Name/Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclude sun glint</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Probability/confidently cloudy</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
4.6.3 VIIRS Parallax Corrected Cloud Optical Properties IP HDF5 Details

Figure 4.6.3-1 provides the details on the content and data types of the VIIRS Parallax Corrected Cloud Optical Properties products. These UML diagrams provide details at the product level only. In addition to these UML diagrams, refer to figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

<table>
<thead>
<tr>
<th>VIIRS-Parx-Corr-Cd-Opt-Prop-IP</th>
</tr>
</thead>
<tbody>
<tr>
<td>+QF1_VIIRSCOPIP : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF2_VIIRSCOPIP : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF3_VIIRSCOPIP : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+cot : H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+eps : H5T_NATIVE_FLOAT</td>
</tr>
</tbody>
</table>

Figure: 4.6.3-1 VIIRS Parallax Corrected Cloud Optical Properties IP UML Diagram

4.6.4 VIIRS Parallax Corrected Cloud Optical Properties IP Metadata Details

The product metadata elements contained in the VIIRS Parallax Corrected Cloud Optical Properties IP are listed in 474-00448-02-01, JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms, Sections 4 and 5. These metadata elements include all common metadata at the root, product, aggregation, and granule level.

There are no granule level Quality Flags defined as metadata elements in the VIIRS Parallax Corrected Cloud Optical Properties IP. Therefore, there are no entries in the N_Quality_Summary_Name/Value metadata attributes for this product.

4.6.5 VIIRS Parallax Corrected Cloud Optical Properties IP Geolocation Details


4.7 VIIRS Parallax Corrected Cloud Top Parameters IP Format

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>IMPI_VPTP_R0100 (Official)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IMPI_VPTP_R0110 (Substitute)</td>
</tr>
<tr>
<td>Description/Purpose</td>
<td>Parallax Corrected Cloud Top Parameters Data</td>
</tr>
<tr>
<td></td>
<td>Effectivity: S-NPP/JPSS</td>
</tr>
<tr>
<td>File-Naming Construct</td>
<td>See the JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.0 for details.</td>
</tr>
<tr>
<td>File Size</td>
<td>See Table: 4.7.1-1 VIIRS Parallax Corrected Cloud Top Parameters Data Content Summary for size. This is based on a 48 scan VIIRS granule. This granule size includes output related fields and quality flags only. Geolocation and metadata attributes are not included. Additional size added by HDF5 packaging is also not included.</td>
</tr>
<tr>
<td>File Format Type</td>
<td>HDF5</td>
</tr>
<tr>
<td>Production Frequency</td>
<td>As required</td>
</tr>
<tr>
<td>Data Content and Data Format</td>
<td>See Section 4.7.1 VIIRS Parallax Corrected Cloud Top Parameters IP Content Summary</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.7.2</td>
<td>VIIRS Parallax Corrected Cloud Top Parameters IP Product Profile</td>
</tr>
<tr>
<td>4.7.3</td>
<td>VIIRS Parallax Corrected Cloud Top Parameters IP HDF5 Details</td>
</tr>
<tr>
<td>4.7.4</td>
<td>VIIRS Parallax Corrected Cloud Top Parameters IP Metadata Details</td>
</tr>
<tr>
<td>4.7.5</td>
<td>VIIRS Parallax Corrected Cloud Top Parameters IP Geolocation Details</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
4.7.1 VIIRS Parallax Corrected Cloud Top Parameters Data Content Summary

Table: 4.7.1-1 VIIRS Parallax Corrected Cloud Top Parameters Data Content Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Data Type</th>
<th>Aggregate Dimensions (N = Number of Granules)</th>
<th>Granule Dimensions</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ctt</td>
<td>Cloud top Temperature</td>
<td>32-bit floating point</td>
<td>[N*768, 3200]</td>
<td>768, 3200</td>
<td>Kelvin</td>
</tr>
<tr>
<td>cth</td>
<td>Cloud Top Height</td>
<td>32-bit floating point</td>
<td>[N*768, 3200]</td>
<td>768, 3200</td>
<td>km</td>
</tr>
<tr>
<td>ctp</td>
<td>Cloud Top Pressure</td>
<td>32-bit floating point</td>
<td>[N*768, 3200]</td>
<td>768, 3200</td>
<td>mbar</td>
</tr>
<tr>
<td>QF1_VIIRSCTPIP</td>
<td>Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*768, 3200]</td>
<td>768, 3200</td>
<td>Unitless</td>
</tr>
<tr>
<td>QF2_VIIRSCTPIP</td>
<td>Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*768, 3200]</td>
<td>768, 3200</td>
<td>Unitless</td>
</tr>
<tr>
<td>QF3_VIIRSCTPIP</td>
<td>Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*768, 3200]</td>
<td>768, 3200</td>
<td>Unitless</td>
</tr>
<tr>
<td>File Size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

36,864,000 Bytes

4.7.2 VIIRS Parallax Corrected Cloud Top Parameters IP Product Profile

Table: 4.7.2-1 VIIRS Parallax Corrected Cloud Top Parameters IP Product Profile

<table>
<thead>
<tr>
<th>Fields</th>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
<th>Granule Boundary</th>
<th>Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
<th>Filled Value</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>ctt</td>
<td>Name</td>
<td>4 byte(s)</td>
<td>M_VIIRS_SDR_ROWS</td>
<td>Yes</td>
<td>No</td>
<td>768</td>
<td>768</td>
<td>NA_FLOAT32_FILL</td>
<td>-999.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>M_VIIRS_SDR_COLS</td>
<td>No</td>
<td>No</td>
<td>3200</td>
<td>3200</td>
<td>MISS_FLOAT32_FILL</td>
<td>-999.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ONBOARD_PT_FLOAT32_FILL</td>
<td>-999.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ONGROUND_PT_FLOAT32_FILL</td>
<td>-999.6</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ERR_FLOAT32_FILL</td>
<td>-999.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ELLIPSOID_FLOAT32_FILL</td>
<td>-999.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VDNE_FLOAT32_FILL</td>
<td>-999.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SOUB_FLOAT32_FILL</td>
<td>-999.2</td>
</tr>
</tbody>
</table>

| cth    | Name | 4 byte(s) | M_VIIRS_SDR_ROWS | Yes         | No      | 768           | 768           | NA_FLOAT32_FILL | -999.9   |
|        |      |           | M_VIIRS_SDR_COLS | No           | No      | 3200          | 3200          | MISS_FLOAT32_FILL | -999.8    |
|        |      |           |               |                |         |                |                | ONBOARD_PT_FLOAT32_FILL | -999.7    |
|        |      |           |               |                |         |                |                | ONGROUND_PT_FLOAT32_FILL | -999.6    |
|        |      |           |               |                |         |                |                | ERR_FLOAT32_FILL | -999.5    |
|        |      |           |               |                |         |                |                | ELLIPSOID_FLOAT32_FILL | -999.4    |

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
**VIIRS-CORR-CTP-IP Product Profile - Quality Flags**

<table>
<thead>
<tr>
<th>Field</th>
<th>Data Size</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>QF1_VIIRSCTPIP</td>
<td>1byte(s)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<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>M_VIIRS_SDR_ROWS</td>
<td>Yes</td>
<td>No</td>
<td>768</td>
<td>768</td>
</tr>
<tr>
<td>M_VIIRS_SDR_COLS</td>
<td>No</td>
<td>No</td>
<td>3200</td>
<td>3200</td>
</tr>
</tbody>
</table>

**Datum**

<table>
<thead>
<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 Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altitude range check</td>
<td>0</td>
<td>3</td>
<td>Unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Na_FLOAT32_FILL</td>
<td>-999.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Miss_FLOAT32_FILL</td>
<td>-999.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Onboard_PT_FLOAT32_FILL</td>
<td>-999.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oneground_PT_FLOAT32_FILL</td>
<td>-999.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Err_FLOAT32_FILL</td>
<td>-999.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>Ellipsoid_FLOAT32_FILL</td>
<td>-999.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VDNE_FLOAT32_FILL</td>
<td>-999.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SOUB_FLOAT32_FILL</td>
<td>-999.2</td>
<td></td>
</tr>
</tbody>
</table>

| Surface type           | 2            | 5                        | Unitless                 | No                 | 3 bit(s)          | Name/Value |            |                |
|                        |              |                          |                          |                    |                   | Land      | 0           |                |
|                        |              |                          |                          |                    |                   | Desert    | 1           |                |
|                        |              |                          |                          |                    |                   | Inland    | 2           |                |
|                        |              |                          |                          |                    |                   | Sea       | 3           |                |
|                        |              |                          |                          |                    |                   | Coastal   | 5           |                |

| Sunglint               | 5            | 1                        | Unitless                 | No                 | 1 bit(s)          | Name/Value |            |                |
|                        |              |                          |                          |                    |                   | In sunglint| 1           |                |
|                        |              |                          |                          |                    |                   | Not       | 0           |                |

| Check if out of range (50-1050 mb) | 6 | 0 | 1 | Unitless | No | 1 bit(s) | Name/Value |            |                |
| Player 2                | 7 | 0 | 1 | Unitless | No | 1 bit(s) | Name/Value |            |                |

| Snow/ice surface       | 7            | 1                        | Unitless                 | No                 | 1 bit(s)          | Name/Value |            |                |
|                        |              |                          |                          |                    |                   | Snow/ice  | 1           |                |
|                        |              |                          |                          |                    |                   | Not       | 0           |                |

| QF2_VIIRSCTPIP         | 1byte(s)    |            |

<table>
<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>M_VIIRS_SDR_ROWS</td>
<td>Yes</td>
<td>No</td>
<td>768</td>
<td>768</td>
</tr>
<tr>
<td>M_VIIRS_SDR_COLS</td>
<td>No</td>
<td>No</td>
<td>3200</td>
<td>3200</td>
</tr>
</tbody>
</table>

**Datum**

<table>
<thead>
<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 Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud phase</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>Unitless</td>
<td>3 bit(s)</td>
<td>Name/Value</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>False</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ice</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mixed</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### Effective Date:  June 07, 2016
#### Block/Revision 0200E

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unitless</th>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check if out of range (0-20 km)</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check if out of range (180-310 Kelvin)</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IR ice ctt convergence for residual night water</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IR ice ctt convergence for residual night ice</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IR ice ctt convergence for residual IR day ice</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QF3_VIIRSCTPIP</td>
<td>1 byte(s)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<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>M_VIIRS_SDR_ROWS</td>
<td>Yes</td>
<td>No</td>
<td>768</td>
<td>768</td>
</tr>
<tr>
<td>M_VIIRS_SDR_COLS</td>
<td>No</td>
<td>No</td>
<td>3200</td>
<td>3200</td>
</tr>
</tbody>
</table>

#### Datum

<table>
<thead>
<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>Scale Factor</th>
<th>Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>A quality flag for using black cloud approach</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>Unitless</td>
<td>No</td>
<td>3 bit(s)</td>
<td></td>
<td></td>
<td>clear</td>
</tr>
<tr>
<td>Window IR for daywater cloud converges</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>Unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td></td>
<td></td>
<td>no convergence</td>
</tr>
<tr>
<td>Spare</td>
<td>4</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>Unitless</td>
<td>No</td>
<td>4 bit(s)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

QP3_VIIRSCTPIP: 1 byte(s)
4.7.3 VIIRS Parallax Corrected Cloud Top Properties IP HDF5 Details

Figure 4.7.3-1 provides the details on the content and data types of the VIIRS Parallax Corrected Cloud Top Properties products. These UML diagrams provide details at the product level only. In addition to these UML diagrams, refer to figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

<table>
<thead>
<tr>
<th>VIIRS-Parx-Corr-Cd-Top-Parm-IP</th>
<th>+QF1_VIIRSCTPIP : H5T_NATIVE_UCHAR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+QF2_VIIRSCTPIP : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td></td>
<td>+QF3_VIIRSCTPIP : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td></td>
<td>+ctt : H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td></td>
<td>+cth : H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td></td>
<td>+ctp : H5T_NATIVE_FLOAT</td>
</tr>
</tbody>
</table>

Figure: 4.7.3-1 VIIRS Parallax Corrected Cloud Top Properties IP UML Diagram

4.7.4 VIIRS Parallax Corrected Cloud Top Parameters IP Metadata Details

The product metadata elements contained in the VIIRS Parallax Corrected Cloud Top Parameters IP are listed in 474-00448-02-01, JPSS Algorithm Specification Vol. II: Data Dictionary for the Common Algorithms, Sections 4 and 5. These metadata elements include all common metadata at the root, product, aggregation, and granule level.

There are no granule level Quality Flags defined as metadata elements in the VIIRS Parallax Corrected Cloud Top Parameters IP. Therefore, there are no entries in the N_Quality_Summary_Name/Value metadata attributes for this product.

4.7.5 VIIRS Parallax Corrected Cloud Top Parameters IP Geolocation Details


4.8 VIIRS Cloud Aggregated Geolocation

<table>
<thead>
<tr>
<th>Description/Purpose</th>
<th>The VIIRS Moderate Resolution SDR geolocation (non terrain corrected) pixel positions are aggregated to produce the Cloud Aggregated (6 km x 6 km) geolocation. The geolocation indicates the location of a cell where the cloud resides, not the average cloud position.</th>
</tr>
</thead>
<tbody>
<tr>
<td>File-Naming Construct</td>
<td>See the JPSS CDFCB-X Vol. I, Section 3.4 for details.</td>
</tr>
<tr>
<td>File Size</td>
<td>See Table: 4.8.1-1 VIIRS Cloud Aggregated Geolocation Data Content Summary for size.</td>
</tr>
<tr>
<td>File Format Type</td>
<td>HDF5</td>
</tr>
</tbody>
</table>
| Data Content and Data Format | For each aggregated cell, the VIIRS Cloud Aggregated Geolocation contains:  
  Time Fields  
  Geolocation Angular Fields  
  Spacecraft Position, Velocity, and Attitude  
  Spacecraft Solar Zenith and Azimuth Angles  
  Geolocation Quality Flags |
<table>
<thead>
<tr>
<th>See Section 4.8.1 VIIRS Cloud Aggregated Geolocation Data Content Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>See Section 4.8.2 VIIRS Cloud Aggregated Geolocation Product Profiles</td>
</tr>
<tr>
<td>See Section 4.8.3 VIIRS Cloud Aggregated Geolocation HDF5 Details</td>
</tr>
<tr>
<td>See Section 4.8.4 VIIRS Cloud Aggregated Geolocation HDF5 Metadata Details</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### 4.8.1 VIIRS Cloud Aggregated Geolocation Data Content Summary

#### Table: 4.8.1-1 VIIRS Cloud Aggregated Geolocation Data Content Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Data Type</th>
<th>Aggregate Dimensions (N = Number of Granules)</th>
<th>Granule Dimensions</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>StartTime</td>
<td>Starting Time of each scan in IET (1/1/1958)</td>
<td>64-bit integer</td>
<td>[N*48]</td>
<td>[48]</td>
<td>microsecond</td>
</tr>
<tr>
<td>MidTime</td>
<td>Mid-Time of each scan in IET (1/1/1958)</td>
<td>64-bit integer</td>
<td>[N*48]</td>
<td>[48]</td>
<td>microsecond</td>
</tr>
<tr>
<td>Latitude</td>
<td>Latitude of each cell (positive North)</td>
<td>32-bit floating point</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>degree</td>
</tr>
<tr>
<td>Longitude</td>
<td>Longitude of each cell (positive East)</td>
<td>32-bit floating point</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>degree</td>
</tr>
<tr>
<td>SolarZenithAngle</td>
<td>Zenith angle of sun at each cell position</td>
<td>32-bit floating point</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>degree</td>
</tr>
<tr>
<td>SolarAzimuthAngle</td>
<td>Azimuth angle of sun (measured clockwise positive from North) at each cell position</td>
<td>32-bit floating point</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>degree</td>
</tr>
<tr>
<td>SatelliteZenithAngle</td>
<td>Zenith angle to Satellite at each cell position</td>
<td>32-bit floating point</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>degree</td>
</tr>
<tr>
<td>SatelliteAzimuthAngle</td>
<td>Azimuth angle (measured clockwise positive from North) to Satellite at each cell position</td>
<td>32-bit floating point</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>degree</td>
</tr>
<tr>
<td>SCPosition</td>
<td>Spacecraft position in ECR Coordinates (X, Y, Z) at the mid-time of scan</td>
<td>32-bit floating point</td>
<td>[N*48, 3]</td>
<td>[48, 3]</td>
<td>meter</td>
</tr>
<tr>
<td>SCVelocity</td>
<td>Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the mid-time of scan</td>
<td>32-bit floating point</td>
<td>[N*48, 3]</td>
<td>[48, 3]</td>
<td>m/s</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### Name | Description | Data Type | Aggregate Dimensions (N = Number of Granules) | Granule Dimensions | Units
---|---|---|---|---|---
SCAttitude | Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at the midtime of scan | 32-bit floating point | [N*48, 3] | [48, 3] | arcsecond

SCSolarZenithAngle | The angle in the spacecraft reference frame from zenith vector (negative z-axis) to the solar vector | 32-bit floating point | [N*48] | [48] | degree

SCSolarAzimuthAngle | The angle in the spacecraft reference frame from x-axis to the solar vector projected onto the spacecraft x-y plane, measured counterclockwise (observer looking toward zenith (negative z-axis)) | 32-bit floating point | [N*48] | [48] | degree

QF1_SCAN_VIIRSCLDAGGGE0 | Scan Level Geolocation Quality Flags | unsigned 8-bit char | [N*48] | [48] | unitless

QF2_VIIRSCLDAGGGE0 | Cell Level Geolocation Quality Flags | unsigned 8-bit char | [N*96, 508] | [96, 508] | unitless

File Size | 1,222,128 Bytes

### 4.8.2 VIIRS Cloud Aggregated Geolocation Product Profile

<table>
<thead>
<tr>
<th>Field</th>
<th>Data Size</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Data Size</td>
<td>Dimensions</td>
</tr>
<tr>
<td>StartTime</td>
<td>8 byte(s)</td>
<td>Name Granule Boundary Dynamic/Min Array Size/Max Array Size Scan Yes No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[46, 46]</td>
</tr>
<tr>
<td>Datum</td>
<td></td>
<td>Description</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Starting Time of each scan in IET (1/1/1958)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NA_INT64_FILL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MISS_INT64_FILL</td>
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<tr>
<td></td>
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<td>ERR_INT64_FILL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VDNE_INT64_FILL</td>
</tr>
</tbody>
</table>

| MidTime | 8 byte(s) | Name Granule Boundary Dynamic/Min Array Size/Max Array Size Scan Yes No | 
| | | 48 | 48 |

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
<table>
<thead>
<tr>
<th>Datum</th>
<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 Scale Factor</th>
<th>Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-Time of each scan in IET (1/1/1958)</td>
<td>0</td>
<td>MIN_VALUE</td>
<td>MAX_VALUE</td>
<td>microsecond</td>
<td>No</td>
<td>64-bit integer</td>
<td>Name</td>
<td>Value</td>
<td>Name/Value</td>
<td></td>
</tr>
<tr>
<td>Latitude</td>
<td>Name</td>
<td>Granule Boundary</td>
<td>Dynamic</td>
<td>Min Array Size</td>
<td>Max Array Size</td>
<td>AlongTrack</td>
<td>Yes</td>
<td>No</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
<td>508</td>
<td>508</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Datum</td>
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<td>SolarZenithAngle</td>
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<td>Max Array Size</td>
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<td>No</td>
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Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### SatelliteZenithAngle 4byte(s)

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<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>AlongTrack</td>
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<td>No</td>
<td>96</td>
<td>96</td>
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<td>CrossTrack</td>
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**Datum**

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<th>Unscaled Valid Range Max</th>
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<th>Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
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<tbody>
<tr>
<td>Zenith angle to Satellite at each cell position</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>Degree</td>
<td>No</td>
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### SatelliteAzimuthAngle 4byte(s)

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<tbody>
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<td>CrossTrack</td>
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**Datum**

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<th>Unscaled Valid Range Max</th>
<th>Measurement Units</th>
<th>Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azimuth angle (measured clockwise positive from North) to Satellite at each cell position</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>Degree</td>
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<td>32-bit floating point</td>
<td>NA_FLOAT32_FILL</td>
<td>.999.9</td>
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<td>MISS_FLOAT32_FILL</td>
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### SCPosition 4byte(s)

<table>
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<td>48</td>
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<tr>
<td>ECRCoordinate</td>
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**Datum**

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<th>Unscaled Valid Range Max</th>
<th>Measurement Units</th>
<th>Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spacecraft position in ECR Coordinates (X, Y, Z) at the mid-time of scan</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>Meter</td>
<td>No</td>
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### SCVelocity 4byte(s)

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<td>48</td>
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<tr>
<td>ECRCoordinate</td>
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**Datum**

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<th>Unscaled Valid Range Max</th>
<th>Measurement Units</th>
<th>Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
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<tbody>
<tr>
<td>Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the mid-time of scan</td>
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<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>m/s</td>
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<td>NA_FLOAT32_FILL</td>
<td>.999.9</td>
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Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### Spacecraft Attitude

<table>
<thead>
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<th>Name</th>
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<th>Dimensions</th>
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<tbody>
<tr>
<td>SCAttitude</td>
<td>4byte(s)</td>
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#### Datum

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<th>Scaled Scale Factor</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spacecraft attitude with respect to Geodetic Reference Frame Coordinates</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>arcsecond</td>
<td>No</td>
<td>32-bit floating point</td>
<td>NA_FLOAT32_FILL</td>
<td>-999.9</td>
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<tr>
<td>(roll, pitch, yaw) at the mid-time of scan</td>
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<td></td>
<td>MISS_FLOAT32_FILL</td>
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<td>ERR_FLOAT32_FILL</td>
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### Solar Zenith Angle

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<th>Scaled Scale Factor</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>The angle in the spacecraft reference frame from zenith vector (negative z-axis) to the solar vector</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>degree</td>
<td>No</td>
<td>32-bit floating point</td>
<td>NA_FLOAT32_FILL</td>
<td>-999.9</td>
</tr>
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<td>-999.5</td>
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### Solar Azimuth Angle

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<tbody>
<tr>
<td>SCSolarAzimuthAngle</td>
<td>4byte(s)</td>
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<th>Scaled Scale Factor</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
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</thead>
<tbody>
<tr>
<td>The angle in the spacecraft reference frame from x-axis to the solar vector</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>degree</td>
<td>No</td>
<td>32-bit floating point</td>
<td>NA_FLOAT32_FILL</td>
<td>-999.9</td>
</tr>
<tr>
<td>projected onto the spacecraft x-y plane, measured counterclockwise</td>
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<td></td>
<td></td>
<td></td>
<td>MISS_FLOAT32_FILL</td>
<td>-999.8</td>
</tr>
<tr>
<td>(observer looking toward zenith (negative z-axis))</td>
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<td>ERR_FLOAT32_FILL</td>
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### VIIRS Cloud Aggregated Geolocation Product Profile - Quality Flags

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
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<td>4byte(s)</td>
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#### Datum

<table>
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<th>Unscaled Valid Range Min</th>
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<th>Measurement Units</th>
<th>Scaled Scale Factor</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
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<tbody>
<tr>
<td>Attitude and Ephemeris Availability Status</td>
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<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2-bit(s)</td>
<td>Name</td>
<td>Nominal - E&amp;A data available</td>
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</tbody>
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Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
Effective Date: June 07, 2016
Block/Revision 0200E

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

<table>
<thead>
<tr>
<th>HAM/RTA Encoder Flag - Indicates the quality of the HAM and RTA encoder timestamps</th>
<th>Name</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Missing Data &lt;= Small Gap</td>
<td>1 bit(s)</td>
<td>Name Value</td>
</tr>
<tr>
<td>Small Gap &lt; Missing Data &lt; Granule Boundary</td>
<td>No</td>
<td>2 bit(s)</td>
</tr>
<tr>
<td>Missing Data &gt;= Granule Boundary</td>
<td>False</td>
<td>0</td>
</tr>
<tr>
<td>Good Data</td>
<td>True</td>
<td>1</td>
</tr>
<tr>
<td>Bad Data - either HAM, RTA, or both are bad for the entire scan</td>
<td>False</td>
<td>0</td>
</tr>
<tr>
<td>Degraded Data - either HAM, RTA, or both are corrupted within the scan</td>
<td>False</td>
<td>0</td>
</tr>
<tr>
<td>Missing Data - Missing encoder data for the scan</td>
<td>True</td>
<td>1</td>
</tr>
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<table>
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<tr>
<th>Within South Atlantic Anomaly</th>
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<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar Eclipse during Earth view scan</td>
<td>Name</td>
<td>Value</td>
</tr>
<tr>
<td>Spare</td>
<td>Name</td>
<td>Value</td>
</tr>
<tr>
<td>Half Angle Mirror side</td>
<td>Name</td>
<td>Value</td>
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<table>
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<th>Value</th>
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</thead>
<tbody>
<tr>
<td>AlignedTrack</td>
<td>Name</td>
<td>Value</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>Name</td>
<td>Value</td>
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<table>
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<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 Value Factor</th>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invalid Input Data (Indicates that any of the Spacecraft Ephemeris or Attitude Data is Invalid or the encoder data is invalid)</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name Value</td>
<td></td>
</tr>
<tr>
<td>Bad Pointing (Indicates that the sensor LOS does not intersect the geoid or is near the limb based upon sensor zenith angle.)</td>
<td>1</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name Value</td>
<td></td>
</tr>
<tr>
<td>Bad Terrain (Indicates that the algorithm could not obtain a valid terrain value.)</td>
<td>2</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name Value</td>
<td></td>
</tr>
<tr>
<td>Invalid Solar Angles</td>
<td>3</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name Value</td>
<td></td>
</tr>
<tr>
<td>Spare</td>
<td>4</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>4 bit(s)</td>
<td>Name Value</td>
<td></td>
</tr>
</tbody>
</table>
4.8.3 VIIRS Cloud Aggregated Geolocation HDF5 Details

Figure 4.8.3-1, VIIRS Cloud Aggregated Geolocation UML Diagram, provides details on the content and data types of the Cloud Aggregated Geolocation. This UML diagram provides details at the product level only. In addition to this UML diagram, refer to Figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

<table>
<thead>
<tr>
<th>VIIRS-CLD-AGG-GEO</th>
</tr>
</thead>
<tbody>
<tr>
<td>+Latitude: H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+Longitude: H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+MidTime: H5T_NATIVE_LLONG</td>
</tr>
<tr>
<td>+QF1_SCAN_VIIRSCLDAGGGEO: H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF2_VIIRSCLDAGGGEO: H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+SCAttitude: H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+SCPosition: H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+SCSolarAzimuthAngle: H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+SCSolarZenithAngle: H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+SCVelocity: H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+SatelliteAzimuthAngle: H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+SatelliteZenithAngle: H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+SolarAzimuthAngle: H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+SolarZenithAngle: H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+StartTime: H5T_NATIVE_LLONG</td>
</tr>
</tbody>
</table>

Figure: 4.8.3-1 VIIRS Cloud Aggregated Geolocation UML Diagram

4.8.4 VIIRS Cloud Aggregated Geolocation HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Cloud Aggregated Geolocation are listed in 474-00448-02-01, the JPSS Algorithm Specification Vol. II: Data Dictionary for the Common Algorithms. The Cloud Aggregated Geolocation metadata includes all common metadata at the root, product, aggregation, and granule level.

In addition to the common metadata items for the VIIRS Cloud Aggregated Geolocation, the following items are included as name/value pairs under the granule level metadata attribute “N_Quality_Summary”:

| Table: 4.8.4-1 VIIRS Cloud Aggregated Geolocation Quality Summary Metadata Values |
|-----------------------------|-----------------|-----------------|----------------|
| Name                        | Value           | Description                                              | Comments |
| Automatic Quality Flag      | 0 - 1           | 0 = Retrieval Successful; 1 = Retrieval not Successful (one or more geolocation subroutines failed) |          |
| Percent Missing Data        | 0 - 100%        | Percent of missing pixels in granule                      |          |
| Percent Out-of-bounds       | 0 - 100%        | Percent of pixels identified as out-of-bounds in granule  |          |
5 Cloud Environmental Data Records (EDRs)

Environmental Data Records (EDRs) are data records that contain the environmental parameters or imagery generated by the JPSS system as products deliverable to the user. The JPSS and S-NPP required set of EDRs are defined in 470-00067-02, the JPSS Ground System Requirements Document, Vol II. An EDR is either an official EDR, which means that it is part of the set of official JPSS Data Products, or it is a substitute EDR. A substitute EDR is produced by substitute ancillary data, data defined by the IDP operator in order to create a data product using different input (specifically, different ancillary data) than that which is prescribed by JPSS. EDRs provide stable measurements useful for long-term trends. An EDR contains the following:

- EDR specific data (as described in each section)
- Appropriate geolocation values
- Quality Flags
- Metadata represented as Attributes in the HDF5 file that are provided at the granule and aggregation level
- The EDRs are separated by category and are presented alphabetically within each category. All S-NPP EDRs are also delivered during JPSS, thus only those EDRs which are JPSS-only are annotated as such within their respective Description/Purpose section of their interface definition.

5.1 Cloud Base Height

The cloud base height is defined as the height above sea level where cloud bases occur. More precisely, for a cloud covered earth location; the cloud base height is the set of altitudes of the bases of the clouds that intersect the local vertical at that particular location.

The reported heights are horizontal spatial averages over a cell, i.e., a square region of the earth’s surface. If a cloud layer does not extend over an entire cell, the spatial average is limited to the portion of the cell that is covered by the layer.

This EDR will be produced from all nominal JPSS orbits, but the measurement accuracy for a terminator orbit might be degraded due to VIIRS calibration limitations for a terminator orbit. The terminator orbit is not included in computing the maximum local average revisit time.

5.1.1 VIIRS Cloud Base Height

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>Description/Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDRE-CLBH-C1030 (Official)</td>
<td>The Cloud Base Height EDR using VIIRS data. The Cloud Base Height EDR is derived by subtracting cloud thickness from cloud top height. Cloud thickness is estimated from input values of Cloud Optical Thickness, Effective Particle Size, and cloud phase. This thickness is subtracted from Cloud Top Height to yield Cloud Base Height. Note that although standard meteorological convention is to provide cloud heights Above Ground Level (AGL), the VIIRS Cloud Base Height is provided as the height above Mean Sea Level (MSL).</td>
</tr>
<tr>
<td>EDRE-CLBH-C1031 (Substitute)</td>
<td></td>
</tr>
<tr>
<td>File-Naming Construct</td>
<td>See the JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4 for details.</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>File Size</strong></td>
<td>See Table: 5.1.1.1-1 VIIRS Cloud Base Height Data Content Summary for size. This granule size includes Cloud Base Height 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.</td>
</tr>
<tr>
<td><strong>File Format Type</strong></td>
<td>HDF5</td>
</tr>
</tbody>
</table>
| **Data Content and Data Format** | Each EDR contains two types of data (layered and averaged) and three types of quality flags (layered, averaged, and non-cloud related). Therefore, each granule will contain:  
  - Layer cloud base height  
  - Average cloud base height (of all layers)*  
  - Quality Flags:  
    - Scale/Offset Factors  
  *Note: The Average Cloud Base Height Field is a simple average of the Cloud Base Heights identified for each cell at each layer. The layers are vertically averaged to provide this field. Be aware that a cell in the Average Cloud Base Height field may contain data averaged from multiple layers widely separated in altitude and therefore very different in cloud base heights.  
  See Section 5.1.1.1 VIIRS Cloud Base Height Data Content Summary  
  See Section 5.1.1.2 VIIRS Cloud Base Height Product Profile  
  See Section 5.1.1.3, VIIRS Cloud Base Height HDF5 Details  
  See Section 5.1.1.4 VIIRS Cloud Base Height HDF5 Metadata Details  
  See Section 5.1.1.5 VIIRS Cloud Base Height Geolocation Details |
5.1.1.1  VIIRS Cloud Base Height Data Content Summary

Table: 5.1.1.1-1  VIIRS Cloud Base Height Data Content Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Data Type</th>
<th>Aggregate Dimensions (N = Number of Granules)</th>
<th>Granule Dimensions</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>LayerCloudBaseHeight</td>
<td>Cloud Base Height - layered product (ordered from top of atmosphere to surface)</td>
<td>unsigned 16-bit integer</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>km</td>
</tr>
<tr>
<td>AverageCloudBaseHeight</td>
<td>Cloud Base Height - Average Cloud Base Height of all Layers</td>
<td>unsigned 16-bit integer</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>km</td>
</tr>
<tr>
<td>QF1_VIIRSCBHLAYEREDDR</td>
<td>Layer CBH Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF2_VIIRSCBHLAYEREDDR</td>
<td>Quality Flags for AverageCloudBaseHeight Fields</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF3_VIIRSCBHAVGEDR</td>
<td>Quality Flags for AverageCloudBaseHeight Fields</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF4_VIIRSCBHAVGEDR</td>
<td>Non-Cloud Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF5_VIIRSCBHAVGEDR</td>
<td>Non-Cloud Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF6_VIIRSCBHAVGEDR</td>
<td>Non-Cloud Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>CBHFactors</td>
<td>Scale = first array element; Offset = 2nd array element</td>
<td>32-bit floating point</td>
<td>[N*2]</td>
<td></td>
<td>Scale = unitless; Offset = km</td>
</tr>
</tbody>
</table>

File Size 1,072,904 Bytes

5.1.1.2  VIIRS Cloud Base Height Product Profile

Table: 5.1.1.2-1  VIIRS Cloud Base Height Product Profile

VIIRS Cloud Base Height Product Profile

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
<th>Name</th>
<th>Granule Boundary Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>LayerCloudBaseHeight</td>
<td>2byte(s)</td>
<td></td>
<td>AlongTrack</td>
<td>Yes</td>
<td>No</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
<td>508</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Layer</td>
<td>No</td>
<td>No</td>
<td>4</td>
</tr>
</tbody>
</table>

Datum Description

<table>
<thead>
<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>Cloud Base Height - layered product (ordered from top of atmosphere to surface)</td>
<td>0</td>
<td>-1.00</td>
<td>20.00</td>
<td>km</td>
<td>Yes</td>
<td>CBHFactors</td>
<td>unsigned 16-bit integer</td>
<td>Name</td>
<td>Value</td>
</tr>
</tbody>
</table>
### Average Cloud Base Height

<table>
<thead>
<tr>
<th>Name</th>
<th>granularity 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 86</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>No 508</td>
<td>508</td>
<td></td>
</tr>
</tbody>
</table>

#### Datum

<table>
<thead>
<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>Cloud Base Height - Average Cloud Base Height of all Layers</td>
<td>0</td>
<td>-1.00</td>
<td>20.00</td>
<td>km</td>
<td>Yes</td>
<td>CBHFactors</td>
<td>integer</td>
<td>65534</td>
<td></td>
</tr>
</tbody>
</table>

### VIIRS Cloud Base Height Product Profile - Quality Flags

#### Fields

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>QF1_VIIRSCBHLAYEREDD</td>
<td>1byte(s)</td>
<td></td>
</tr>
</tbody>
</table>

#### Datum

<table>
<thead>
<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>Cloud Confidence (Indicates cloudiness - percent cloudiness for this layer)</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>0</td>
<td>0</td>
<td>0 % &lt;= cloudiness &lt; 25%</td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Water Cloud</td>
<td>2</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>0</td>
<td>0</td>
<td>0 % &lt;= Water Cloud Fraction &lt; 25%</td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Multi-Layer Cloud</td>
<td>4</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>0</td>
<td>0</td>
<td>0 % &lt;= Multi-layer Cloud Fraction &lt; 25%</td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Mixed Phase (Water and Ice) Cloud</td>
<td>6</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>0</td>
<td>0</td>
<td>0 % &lt;= Mixed Phase Cloud Fraction &lt; 25%</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### QF2_VIIRSCBHLAYEREDR

<table>
<thead>
<tr>
<th>Name</th>
<th>Granule Boundary Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Along Track</td>
<td>Yes</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>Cross Track</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
<tr>
<td>Layer</td>
<td>No</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

**Datum**

<table>
<thead>
<tr>
<th>Description</th>
<th>Offset</th>
<th>Unscaled Valid Range Min</th>
<th>Unscaled Valid Range Max</th>
<th>Measurement Units</th>
<th>Scaled Scale Factor</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Quality (Percent of valid retrievals = valid retrievals / total number of cloudy pixels)</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>0% &lt;= valid retrievals &lt; 25%</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25% &lt;= valid retrievals &lt; 50%</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50% &lt;= valid retrievals &lt; 75%</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75% &lt;= valid retrievals &lt;= 100%</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Out of bounds** - More than 50% of pixels in Horizontal Cell are outside of the system spec valid range.

<table>
<thead>
<tr>
<th>Offset</th>
<th>Unscaled Valid Range Min</th>
<th>Unscaled Valid Range Max</th>
<th>Measurement Units</th>
<th>Scaled Scale Factor</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>False</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>True</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Convergent Pixels** - More than 50% of pixels in Horizontal Cell are convergent (This flag indicates that one of the upstream algorithms did converge (COP or CTP) for those cloud EDRs whose algorithms do converge).

<table>
<thead>
<tr>
<th>Offset</th>
<th>Unscaled Valid Range Min</th>
<th>Unscaled Valid Range Max</th>
<th>Measurement Units</th>
<th>Scaled Scale Factor</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>False</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>True</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Pixels with COT < 1.0 in Horizontal Cell > 50%**

<table>
<thead>
<tr>
<th>Offset</th>
<th>Unscaled Valid Range Min</th>
<th>Unscaled Valid Range Max</th>
<th>Measurement Units</th>
<th>Scaled Scale Factor</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>False</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>True</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Spare**

<table>
<thead>
<tr>
<th>Offset</th>
<th>Unscaled Valid Range Min</th>
<th>Unscaled Valid Range Max</th>
<th>Measurement Units</th>
<th>Scaled Scale Factor</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>False</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>True</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ice Cloud Pixels with COT > 10.0 in Horizontal Cell > 50%**

<table>
<thead>
<tr>
<th>Offset</th>
<th>Unscaled Valid Range Min</th>
<th>Unscaled Valid Range Max</th>
<th>Measurement Units</th>
<th>Scaled Scale Factor</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>False</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>True</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Cloud Fractional Coverage within Horizontal Cell - Mixed Phase (Water and Ice) Cloud

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>75% &lt;= Multi-layer Cloud Fraction &lt;= 100%</td>
<td>3</td>
<td>55% &lt;= Mixed Phase Cloud Fraction &lt; 25%</td>
</tr>
<tr>
<td>25% &lt;= Mixed Phase Cloud Fraction &lt; 50%</td>
<td>1</td>
<td>50% &lt;= Mixed Phase Cloud Fraction &lt; 75%</td>
</tr>
<tr>
<td>75% &lt;= Mixed Phase Cloud Fraction &lt;= 100%</td>
<td>3</td>
<td>75% &lt;= Mixed Phase Cloud Fraction &lt;= 100%</td>
</tr>
</tbody>
</table>

#### QP4_VIIRSCBHAVGEDR

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Quality (Percent of valid retrievals = valid Retrievals / total number of cloudy pixels)</td>
<td>3</td>
<td>Overall Quality (Percent of valid retrievals = valid Retrievals / total number of cloudy pixels)</td>
</tr>
<tr>
<td>Out of bounds - More than 50% of pixels in Horizontal Cell are outside of the system spec valid range.</td>
<td>3</td>
<td>Out of bounds - More than 50% of pixels in Horizontal Cell are outside of the system spec valid range.</td>
</tr>
<tr>
<td>Convergent Pixels - More than 50% of pixels in Horizontal Cell are convergent (This flag indicates that one of the upstream algorithms did converge (COP or CTP) for those cloud EDRs whose algorithms do converge)</td>
<td>3</td>
<td>Convergent Pixels - More than 50% of pixels in Horizontal Cell are convergent (This flag indicates that one of the upstream algorithms did converge (COP or CTP) for those cloud EDRs whose algorithms do converge)</td>
</tr>
<tr>
<td>Pixels with COT &lt; 1.0 in Horizontal Cell &gt; 50%</td>
<td>3</td>
<td>Pixels with COT &lt; 1.0 in Horizontal Cell &gt; 50%</td>
</tr>
<tr>
<td>Spare</td>
<td>3</td>
<td>Spare</td>
</tr>
</tbody>
</table>

#### QP5_VIIRSCBHEDR

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snow/Ice Fraction</td>
<td>3</td>
<td>Snow/Ice Fraction</td>
</tr>
<tr>
<td>Exclusion - Sunglint (Percent of pixels in sunglint in Horizontal Cell)</td>
<td>3</td>
<td>Exclusion - Sunglint (Percent of pixels in sunglint in Horizontal Cell)</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
5.1.1.3 VIIRS Cloud Base Height HDF5 Details

Figure 5.1.1.3-1, VIIRS Cloud Base Height UML Diagram, provides the details on the content and datatypes of the Cloud Base Height. These UML diagrams provide details at the product level only. In addition to these UML diagrams, refer to Figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

<table>
<thead>
<tr>
<th>VIIRS-CBH-EDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>+AverageCloudBaseHeight : H5T_NATIVE_USHORT</td>
</tr>
<tr>
<td>+CBHFactors : H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+LayerCloudBaseHeight : H5T_NATIVE_USHORT</td>
</tr>
<tr>
<td>+QF1_VIIRSCBHLAYEREDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF2_VIIRSCBHLAYEREDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF3_VIIRSCBHAVGEDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF4_VIIRSCBHAVGEDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF5_VIIRSCBHEDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF6_VIIRSCBHEDR : H5T_NATIVE_UCHAR</td>
</tr>
</tbody>
</table>

Figure: 5.1.1.3-1 VIIRS Cloud Base Height UML Diagram

5.1.1.4 VIIRS Cloud Base Height HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Cloud Base Height EDR are listed in 474-00448-02-01, the JPSS Algorithm Specification Vol. II: Data Dictionary for the Common Algorithms, Section 4 and 5. The VIIRS EDR metadata includes all of the common metadata at the root, product, aggregation, and granule levels.

In addition to the common metadata items for this product, Table 5.1.1.4-1, VIIRS Cloud Base Height Quality Summary Metadata Values, provides the following items as name/value pairs. The listed name/value pair items in the table are the granule level quality flags for the VIIRS Cloud Base Height EDR.

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusion/Degradation Summary</td>
<td>0 - 100</td>
<td>Percent of cloudy pixels with one or more exclusion or degradation criteria flags</td>
<td></td>
</tr>
<tr>
<td>Percent Converged Pixels</td>
<td>0 - 100</td>
<td>A ratio (expressed as a percent) of the number of converged vs. that of cloudy pixels for the entire granule.</td>
<td></td>
</tr>
</tbody>
</table>

5.1.1.5 VIIRS Cloud Base Height Geolocation Details

See Section 4.8, VIIRS Cloud Aggregated Geolocation.

5.1.2 Cloud Cover/Layers

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>EDRE-VCCL-C0030 (Official)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EDRE-VCCL-C0031 (Substitute)</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
The cloud cover is defined as the fraction of a given area on the earth’s surface for which a locally normal line segment, extending between two given altitudes, intersects a cloud.

This EDR will be produced from all nominal JPSS orbits, but the measurement accuracy for a terminator orbit will be degraded due to VIIRS calibration limitations for a terminator orbit.

Sensors: VIIRS
Effectivity: S-NPP/JPSS

<table>
<thead>
<tr>
<th>Description/Purpose</th>
<th>See the JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4 for details.</th>
</tr>
</thead>
<tbody>
<tr>
<td>File-Naming Construct</td>
<td>See the JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4 for details.</td>
</tr>
<tr>
<td>File Size</td>
<td>See Table: 5.1.2.1-1 VIIRS Cloud Cover/Layers Height Data Content Summary for size. This granule size includes Cloud Cover/Layers 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.</td>
</tr>
<tr>
<td>File Format Type</td>
<td>HDF5</td>
</tr>
<tr>
<td>Data Content and Data Format</td>
<td>For each cell, the Cloud Cover/Layers EDR contains: Layer cloud cover Summed cloud cover (of all layers) Cloud type Quality Flags Scale/Offset Factors See Section 5.1.2.1, Cloud Cover/Layers Data Content Summary See Section 5.1.2.2 Cloud Cover/Layers Product Profile See Section 5.1.2.3, Cloud Cover/Layers HDF5 Details See Section 5.1.2.4, Cloud Cover/Layers HDF5 Metadata Details See Section 5.1.2.5, Cloud Cover/Layers Geolocation Details</td>
</tr>
</tbody>
</table>
### 5.1.2.1 VIIRS Cloud Cover/Layers Data Content Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Data Type</th>
<th>Aggregate Dimensions (N = Number of Granules)</th>
<th>Granule Dimensions</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>LayerCloudCover</td>
<td>Cloud Cover Fraction - layered product (ordered from top of atmosphere to surface)</td>
<td>unsigned 16-bit integer</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>unitless</td>
</tr>
<tr>
<td>SummedCloudCover</td>
<td>Cloud Cover Fraction - Vertical Sum of all layers</td>
<td>unsigned 16-bit integer</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>LayerCloudType</td>
<td>Cloud Type - layered product (ordered from top of atmosphere to surface)</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF1_VIIRSCCLAYEREDR</td>
<td>Layer CCL Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF2_VIIRSCCLAYEREDR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QF3_VIIRSCCLSUMEDR</td>
<td>Quality Flags for SummedCloudCover Field</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF4_VIIRSCCLSUMEDR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QF5_VIIRSCCLEDR</td>
<td>Non-Cloud Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF6_VIIRSCCLEDR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCLFactors</td>
<td>Scale = first array element; Offset = 2nd array element</td>
<td>32-bit floating point</td>
<td>[N*2]</td>
<td>[2]</td>
<td></td>
</tr>
</tbody>
</table>

**File Size**: 1,267,976 Bytes

### 5.1.2.2 VIIRS Cloud Cover/Layers Height Product Profile

<table>
<thead>
<tr>
<th>Name</th>
<th>Name</th>
<th>Granule Boundary</th>
<th>Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
<th>AlongTrack</th>
<th>Yes</th>
<th>No</th>
<th>96</th>
<th>96</th>
<th>CrossTrack</th>
<th>No</th>
<th>508</th>
<th>508</th>
<th>Layer</th>
<th>No</th>
<th>No</th>
<th>4</th>
<th>4</th>
<th>Datum</th>
</tr>
</thead>
<tbody>
<tr>
<td>LayerCloudCover</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
**Cloud Cover Fraction** - layered product (ordered from top of atmosphere to surface)

<table>
<thead>
<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>0</td>
<td>0.00</td>
<td>1.00</td>
<td>unitless</td>
<td>Yes</td>
<td>CCLFactors</td>
<td>unsigned 16-bit integer</td>
<td></td>
<td>Name [Value]</td>
</tr>
</tbody>
</table>

**SummedCloudCover** - byte(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>Granule Boundary Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AlongTrack</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

**LayerCloudType** - byte(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>Granule Boundary Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AlongTrack</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Layer</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

**VIIRS Cloud Cover Layers Height Product Profile - Quality Flags**

**Fields**

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>QF1_VIIRSCCLAYERED</td>
<td>byte(s)</td>
<td>Granule Boundary Dynamic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Granule Boundary Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AlongTrack</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Layer</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<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>Cloud Confidence (Indicates cloudiness - percent cloudiness for this layer)</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>CCLFactors</td>
<td>2-bit(s)</td>
<td>Name [Value]</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<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>Cloud Fractional Coverage within Horizontal Cell - Water Cloud</td>
<td>2</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>CCLFactors</td>
<td>2-bit(s)</td>
<td>Name [Value]</td>
<td></td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
<table>
<thead>
<tr>
<th>Name</th>
<th>Granule Boundary Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Along Track: Yes</td>
<td>No</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>Cross Track: No</td>
<td>No</td>
<td>508</td>
</tr>
<tr>
<td></td>
<td>Layer: No</td>
<td>No</td>
<td>4</td>
</tr>
</tbody>
</table>

**Cloud Fractional Coverage within Horizontal Cell - Multi-Layer Cloud**

<table>
<thead>
<tr>
<th>MIN_VAL</th>
<th>MAX_VAL</th>
<th>unitless</th>
<th>No</th>
<th>2 bit(s)</th>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>Multi-layer Cloud Fraction &lt; 25%</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25%</td>
<td>Multi-layer Cloud Fraction &lt; 50%</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50%</td>
<td>Multi-layer Cloud Fraction &lt; 75%</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75%</td>
<td>Multi-layer Cloud Fraction &lt;= 100%</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Cloud Fractional Coverage within Horizontal Cell - Mixed Phase (Water and Ice) Cloud**

<table>
<thead>
<tr>
<th>MIN_VAL</th>
<th>MAX_VAL</th>
<th>unitless</th>
<th>No</th>
<th>2 bit(s)</th>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>Mixed Phase Cloud Fraction &lt; 25%</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25%</td>
<td>Mixed Phase Cloud Fraction &lt; 50%</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50%</td>
<td>Mixed Phase Cloud Fraction &lt; 75%</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75%</td>
<td>Mixed Phase Cloud Fraction &lt;= 100%</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Overall Quality** (Percent of valid retrievals = valid Retrievals / total number of cloudy pixels)

<table>
<thead>
<tr>
<th>MIN_VAL</th>
<th>MAX_VAL</th>
<th>unitless</th>
<th>No</th>
<th>2 bit(s)</th>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>% valid retrievals &lt; 25%</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25%</td>
<td>% valid retrievals &lt; 50%</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50%</td>
<td>% valid retrievals &lt; 75%</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75%</td>
<td>% valid retrievals &lt;= 100%</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Out of bounds** - More than 50% of pixels in Horizontal Cell are outside of the system spec valid range.

<table>
<thead>
<tr>
<th>MIN_VAL</th>
<th>MAX_VAL</th>
<th>unitless</th>
<th>No</th>
<th>1 bit(s)</th>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>False</td>
<td>0</td>
<td>True</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Convergent Pixels** - More than 50% of pixels in Horizontal Cell are convergent. This flag indicates that one of the upstream algorithms did converge (COP or CTP) for those cloud EDRs whose algorithms do converge.

<table>
<thead>
<tr>
<th>MIN_VAL</th>
<th>MAX_VAL</th>
<th>unitless</th>
<th>No</th>
<th>1 bit(s)</th>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>False</td>
<td>0</td>
<td>True</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Pixels with COT < 1.0 in Horizontal Cell > 50%**

<table>
<thead>
<tr>
<th>MIN_VAL</th>
<th>MAX_VAL</th>
<th>unitless</th>
<th>No</th>
<th>1 bit(s)</th>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>False</td>
<td>0</td>
<td>True</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ice Cloud Pixels with COT > 10.0 in Horizontal Cell > 50%**

<table>
<thead>
<tr>
<th>MIN_VAL</th>
<th>MAX_VAL</th>
<th>unitless</th>
<th>No</th>
<th>1 bit(s)</th>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>False</td>
<td>0</td>
<td>True</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
<table>
<thead>
<tr>
<th>Cloud Fractional Coverage within Horizontal Cell - Water Cloud</th>
<th>2</th>
<th>MIN_VAL</th>
<th>MAX_VAL</th>
<th>unitless</th>
<th>No</th>
<th>2 bit(s)</th>
<th>Name/Value</th>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3% &lt;= cloudiness &lt; 25%</td>
<td>0</td>
<td>25% &lt;= cloudiness &lt; 50%</td>
<td>1</td>
<td>50% &lt;= cloudiness &lt; 75%</td>
<td>2</td>
<td>75% &lt;= cloudiness &lt;= 100%</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Multi-Layer Cloud</td>
<td>4</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>Name</td>
<td>Value</td>
</tr>
<tr>
<td></td>
<td>3% &lt;= Multi-layer Cloud Fraction &lt; 25%</td>
<td>0</td>
<td>25% &lt;= Multi-layer Cloud Fraction &lt; 50%</td>
<td>1</td>
<td>50% &lt;= Multi-layer Cloud Fraction &lt; 75%</td>
<td>2</td>
<td>75% &lt;= Multi-layer Cloud Fraction &lt;= 100%</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Mixed Phase (Water and Ice) Cloud</td>
<td>6</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>Name</td>
<td>Value</td>
</tr>
<tr>
<td></td>
<td>3% &lt;= Mixed Phase Cloud Fraction &lt; 25%</td>
<td>0</td>
<td>25% &lt;= Mixed Phase Cloud Fraction &lt; 50%</td>
<td>1</td>
<td>50% &lt;= Mixed Phase Cloud Fraction &lt; 75%</td>
<td>2</td>
<td>75% &lt;= Mixed Phase Cloud Fraction &lt;= 100%</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q4L_VIIRSCLSUMEDR</th>
<th>1 byte(s)</th>
<th>Name</th>
<th>Granule Boundary 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>96</td>
<td>96</td>
<td></td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
<td>508</td>
<td>508</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Datum</th>
<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/Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Quality (Percent of valid retrievals = valid Retrievals / total number of cloudy pixels)</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>Name</td>
<td>Value</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>75</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;= 100%</td>
<td></td>
</tr>
<tr>
<td>Out of bounds - More than 50% of pixels in Horizontal Cell are outside of the system spec valid range.</td>
<td>2</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>Name</td>
<td>Value</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>False</td>
<td>False</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>True</td>
<td>True</td>
</tr>
<tr>
<td>Convergent Pixels - More than 50% of pixels in Horizontal Cell are convergent (This flag indicates that one of the upstream algorithms did converge (COP or CTP) for those cloud EDRs whose algorithms do converge).</td>
<td>3</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>Name</td>
<td>Value</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>False</td>
<td>False</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>True</td>
<td>True</td>
</tr>
<tr>
<td>Pixels with COT &lt; 1.0 in Horizontal Cell &gt; 50%</td>
<td>4</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>Name</td>
<td>Value</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>False</td>
<td>False</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>True</td>
<td>True</td>
</tr>
<tr>
<td>Spare</td>
<td>5</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>Name</td>
<td>Value</td>
</tr>
<tr>
<td>Ice Cloud Pixels with COT &gt; 10.0 in Horizontal Cell &gt; 50%</td>
<td>7</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>Name</td>
<td>Value</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
## QF5_VIIRSCCLEDR

<table>
<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></td>
<td>AlongTrack</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
<tr>
<td></td>
<td>CrossTrack</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
</tbody>
</table>

### Datum Description
- **Snow/Ice Fraction**
  - AlongTrack: Yes
  - CrossTrack: No
  - Minimum Unscaled Value: MIN_VAL
  - Maximum Unscaled Value: MAX_VAL
  - Units: unitless
  - Scale Factor: No
  - Data Type: 2 bit(s)

### Fill Values
- **0% <= Snow/Ice Fraction < 25%**
- **25% <= Snow/Ice Fraction < 50%**
- **50% <= Snow/Ice Fraction < 75%**
- **75% <= Snow/Ice Fraction <= 100%**

### Legend Entries
- **Exclusion** - Sunglint (Percent of pixels in sunglint in Horizontal Cell)
  - AlongTrack: Yes
  - CrossTrack: No
  - Minimum Unscaled Value: MIN_VAL
  - Maximum Unscaled Value: MAX_VAL
  - Units: unitless
  - Scale Factor: No
  - Data Type: 2 bit(s)

### Fill Values
- **0% <= Sunglint Fraction < 25%**
- **25% <= Sunglint Fraction < 50%**
- **50% <= Sunglint Fraction < 75%**
- **75% <= Sunglint Fraction <= 100%**

### Legend Entries
- **Day/Night Degradation Flag**
  - AlongTrack: Yes
  - CrossTrack: No
  - Minimum Unscaled Value: MIN_VAL
  - Maximum Unscaled Value: MAX_VAL
  - Units: unitless
  - Scale Factor: No
  - Data Type: 2 bit(s)

### Fill Values
- **Day (Solar Zenith Angle < 75 degrees)**
- **Night (Solar Zenith Angle >= 75 degrees)**
- **Transition (Terminator)**

### Legend Entries
- **Bad SDR Data** (Quality of CCL degraded or CCL not obtained due to any bad SDR data in Horizontal cell)
  - AlongTrack: Yes
  - CrossTrack: No
  - Minimum Unscaled Value: MIN_VAL
  - Maximum Unscaled Value: MAX_VAL
  - Units: unitless
  - Scale Factor: No
  - Data Type: 2 bit(s)

### Fill Values
- **Good**
- **Poor**
- **No Calibration**

## QF6_VIIRSCCLEDR

<table>
<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></td>
<td>AlongTrack</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
<tr>
<td></td>
<td>CrossTrack</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
</tbody>
</table>

### Datum Description
- **Surface Type - Sea Water (Ocean) Fractional Coverage within Horizontal Cell**
  - AlongTrack: Yes
  - CrossTrack: No
  - Minimum Unscaled Value: MIN_VAL
  - Maximum Unscaled Value: MAX_VAL
  - Units: unitless
  - Scale Factor: No
  - Data Type: 2 bit(s)

### Fill Values
- **0% <= Sea Water Fraction < 25%**
- **25% <= Sea Water Fraction < 50%**
- **50% <= Sea Water Fraction < 75%**
- **75% <= Sea Water Fraction <= 100%**

### Legend Entries
- **Surface Type - Coastal Fractional Coverage within Horizontal Cell**
  - AlongTrack: Yes
  - CrossTrack: No
  - Minimum Unscaled Value: MIN_VAL
  - Maximum Unscaled Value: MAX_VAL
  - Units: unitless
  - Scale Factor: No
  - Data Type: 2 bit(s)

### Fill Values
- **0% <= Coastal Fraction < 25%**
- **25% <= Coastal Fraction < 50%**
- **50% <= Coastal Fraction < 75%**
- **75% <= Coastal Fraction <= 100%**

### Legend Entries
- **spare**
  - AlongTrack: Yes
  - CrossTrack: No
  - Minimum Unscaled Value: MIN_VAL
  - Maximum Unscaled Value: MAX_VAL
  - Units: unitless
  - Scale Factor: No
  - Data Type: 4 bit(s)

### VIIRS Cloud Cover Layers Height Product Profile - Scale Factors

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu dsp.cfm to verify that this is the correct version prior to use.

### Table: CCLFactors

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
<th>Granule Boundary</th>
<th>Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCLFactors</td>
<td>4byte(s)</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

### Table: Datum

<table>
<thead>
<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>Scale = first array element; Offset = 2nd array element</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>32-bit floating point</td>
<td>Name/Value</td>
<td>Name/Value</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

474-00448-02-16-B0200

Effective Date: June 07, 2016

Block/Revision 0200E
5.1.2.3 VIIRS Cloud Cover/Layers HDF5 Details

Figure 5.1.2.3-1, VIIRS Cloud Cover/Layers UML Diagram, provides the details on the content and datatypes of the Cloud Cover/Layers EDR. These UML diagrams provide details at the product level only. In addition to these UML diagrams, refer to Figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

<table>
<thead>
<tr>
<th>VIIRS-CCL-EDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>+CCLFactors : H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+LayerCloudCover : H5T_NATIVE_USHORT</td>
</tr>
<tr>
<td>+LayerCloudType : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF1_VIIRSCCLAYEREDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF2_VIIRSCCLAYEREDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF3_VIIRSCCLSUMEDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF4_VIIRSCCLSUMEDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF5_VIIRSCCLEDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF6_VIIRSCCLEDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+SummedCloudCover : H5T_NATIVE_USHORT</td>
</tr>
</tbody>
</table>

Figure: 5.1.2.3-1 VIIRS Cloud Cover/Layers UML Diagram

5.1.2.4 VIIRS Cloud Cover/Layers HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Cloud Cover/Layers EDR are listed in 474-00448-02-01, the JPSS Algorithm Specification Vol. II: Data Dictionary for the Common Algorithms. The VIIRS EDR metadata includes all of the common metadata at the root, product, aggregation, and granule levels.

In addition to the common metadata items for this product, Table 5.1.2.4-1, VIIRS Cloud Cover/Layers Quality Summary Metadata Values, provides the following items as name/value pairs. The listed name/value pair items in the table are the granule level quality flags for the VIIRS Cloud Cover/Layers EDR.

<table>
<thead>
<tr>
<th>Table: 5.1.2.4-1 VIIRS Cloud Cover/Layers Quality Summary Metadata Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N_Quality_Summary</strong></td>
</tr>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Exclusion/Degradation Summary</td>
</tr>
<tr>
<td>Percent Converged Pixels</td>
</tr>
</tbody>
</table>

5.1.2.5 VIIRS Cloud Cover/Layers Geolocation Details

See Section 4.8, VIIRS Cloud Aggregated Geolocation.
## 5.1.3 Cloud Effective Particle Size

| Data Mnemonic       | EDRE-VCEP-C0030 (Official)  
<table>
<thead>
<tr>
<th></th>
<th>EDRE-VCEP-C0031 (Substitute)</th>
</tr>
</thead>
</table>
| **Description/Purpose** | Effective cloud particle size is defined as the ratio of the third moment of the drop size distribution to the second moment, averaged over a layer of air within a cloud. 

The Cloud Effective Particle Size EDR is reported in units of micrometers. Sensors: VIIRS 

Effectivity: S-NPP/JPSS |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>File-Naming Construct</strong></td>
<td>See the JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4 for details.</td>
</tr>
</tbody>
</table>
| **File Size** | See Table: 5.1.3.1-1 Cloud Effective Particle Size Data Content Summary for size. 

This granule size includes Cloud Effective Particle Size 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** | For each cell, the Cloud Effective Particle Size EDR contains: 

- Layer effective particle size 

- Average effective particle size (of all layers) * 

- Scale/Offset Factors 

*Note: The Average Cloud Effective Particle Size Field is a simple average of the Cloud Effective Particle Sizes identified for each cell at each layer. The layers are vertically averaged to provide this field. Be aware that a cell in the Average Cloud Effective Particle Size field may contain data averaged from multiple layers widely separated in altitude and therefore very different in cloud type and effective particle size. 

See Section 5.1.3.1, Cloud Effective Particle Size Data Content Summary 

See Section 5.1.3.2, Cloud Effective Particle Size Product Profile 

See Section 5.1.3.3, Cloud Effective Particle Size HDF5 Details 

See Section 5.1.3.4, Cloud Effective Particle Size HDF5 Metadata Details 

See Section 5.1.3.5, Cloud Effective Particle Size Geolocation Details |
5.1.3.1 Cloud Effective Particle Size Data Content Summary

Table: 5.1.3.1-1 Cloud Effective Particle Size Data Content Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Data Type</th>
<th>Aggregate Dimensions (N = Number of Granules)</th>
<th>Granule Dimensions</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>LayerCloudEffectiveParticleSize</td>
<td>Cloud Effective Particle Size - layered product (ordered from top of atmosphere to surface)</td>
<td>unsigned 16-bit integer</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>micrometers</td>
</tr>
<tr>
<td>AverageCloudEffectiveParticleSize</td>
<td>Cloud Effective Particle Size - Average of all layers</td>
<td>unsigned 16-bit integer</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>micrometers</td>
</tr>
<tr>
<td>QF1_VIIRSCEPSLAYEREDDR</td>
<td>Layer CEPS Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF2_VIIRSCEPSLAYEREDDR</td>
<td></td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF3_VIIRSCEPSAVGEDR</td>
<td>Quality Flags for Averaged CEPS Fields</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF4_VIIRSCEPSAVGEDR</td>
<td></td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF5_VIIRSCEPSEDGR</td>
<td>Non-Cloud Quality Flags</td>
<td>unsigned 8-bit char</td>
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<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF6_VIIRSCEPSEDGR</td>
<td></td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>CEPSSFactors</td>
<td>Scale = first array element; Offset = 2nd array element</td>
<td>32-bit floating point</td>
<td>[N*2]</td>
<td>[2]</td>
<td>Scale = unitless; Offset = micrometers</td>
</tr>
</tbody>
</table>

File Size 1,072,904 Bytes

5.1.3.2 Cloud Effective Particle Size Product Profile

Table: 5.1.3.2-1 Cloud Effective Particle Size Product Profile

Cloud Effective Particle Size Product Profile

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>LayerCloudEffectiveParticleSize</td>
<td>2byte(s)</td>
<td>Granule Boundary</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### Cloud Effective Particle Size - Quality Flags

<table>
<thead>
<tr>
<th>Name</th>
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</tr>
</thead>
<tbody>
<tr>
<td>QF1_VIIRSCEPSLAYERED</td>
<td>1byte(s)</td>
<td>AlongTrack: Yes No 96 96</td>
</tr>
</tbody>
</table>

<table>
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<th>Description</th>
<th>Data Values</th>
<th>Units</th>
<th>Scale Factor</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
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<tbody>
<tr>
<td>AlongTrack</td>
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<td>CrossTrack</td>
<td>No No 508 508</td>
<td>Layer No 4 4</td>
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<th>Description</th>
<th>Data Offset</th>
<th>Unscaled Valid Range Min</th>
<th>Unscaled Valid Range Max</th>
<th>Measurement Units</th>
<th>Scaled</th>
<th>Scale Factor</th>
<th>Name</th>
<th>Data Type</th>
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<th>Legend Entries</th>
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<tr>
<td>Cloud Confidence (Indicates cloudiness - percent cloudiness for this layer)</td>
<td>0</td>
<td>0.00</td>
<td>124.00</td>
<td>micrometers</td>
<td>Yes</td>
<td>CEPSFactors</td>
<td>unsigned 16-bit integer</td>
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<table>
<thead>
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<th>Name</th>
<th>Value</th>
<th>Name</th>
<th>Value</th>
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</thead>
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<tr>
<td>NA_UINT16_FILL</td>
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<td>MISS_UINT16_FILL</td>
<td>65534</td>
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<tr>
<td>ERR_UINT16_FILL</td>
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<td>ELLIPSOID_UINT16_FILL</td>
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<td>VDNE_UINT16_FILL</td>
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<td>SOUR_UINT16_FILL</td>
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### Cloud Effective Particle Size Product Profile - Quality Flags

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</thead>
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<td>1byte(s)</td>
<td>AlongTrack: Yes No 96 96</td>
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</tbody>
</table>

<table>
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<th>Description</th>
<th>Data Offset</th>
<th>Unscaled Valid Range Min</th>
<th>Unscaled Valid Range Max</th>
<th>Measurement Units</th>
<th>Scaled</th>
<th>Scale Factor</th>
<th>Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Water Cloud</td>
<td>2</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2bit(s)</td>
<td>Name</td>
<td>Value</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Multi-Layer Cloud</td>
<td>4</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2bit(s)</td>
<td>Name</td>
<td>Value</td>
<td></td>
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<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0% &lt;= cloudiness &lt; 25%</td>
<td>0</td>
<td>25% &lt;= cloudiness &lt; 50%</td>
<td>1</td>
</tr>
<tr>
<td>50% &lt;= cloudiness &lt; 75%</td>
<td>2</td>
<td>75% &lt;= cloudiness &lt;= 100%</td>
<td>3</td>
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<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0% &lt;= Water Cloud Fraction &lt; 25%</td>
<td>0</td>
<td>25% &lt;= Water Cloud Fraction &lt; 50%</td>
<td>1</td>
</tr>
<tr>
<td>50% &lt;= Water Cloud Fraction &lt; 75%</td>
<td>2</td>
<td>75% &lt;= Water Cloud Fraction &lt;= 100%</td>
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<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0% &lt;= Multi-layer Cloud Fraction &lt; 25%</td>
<td>0</td>
<td>25% &lt;= Multi-layer Cloud Fraction &lt; 50%</td>
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<td>50% &lt;= Multi-layer Cloud Fraction &lt; 75%</td>
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</table>
### Cloud Fractional Coverage within Horizontal Cell - Mixed Phase (Water and Ice) Cloud

<table>
<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>96</td>
<td>96</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
<tr>
<td>Layer</td>
<td>No</td>
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#### Datum

<table>
<thead>
<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/Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Quality (Percent of valid retrievals = valid Retrievals / total number of cloudy pixels)</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 &lt;= % valid retrievals &lt; 25%</td>
<td>0</td>
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<tr>
<td>25 &lt;= % valid retrievals &lt; 50%</td>
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<tr>
<td>50 &lt;= % valid retrievals &lt; 75%</td>
<td>2</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>75 &lt;= % valid retrievals &lt;= 100%</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Out of bounds - More than 50% of pixels in Horizontal Cell are outside of the system spec valid range.</td>
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<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
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</tr>
<tr>
<td>0 &lt;= % valid retrievals &lt; 25%</td>
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</tr>
<tr>
<td>25 &lt;= % valid retrievals &lt; 50%</td>
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<tr>
<td>50 &lt;= % valid retrievals &lt; 75%</td>
<td>2</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75 &lt;= % valid retrievals &lt;= 100%</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Convergent Pixels - More than 50% of pixels in Horizontal Cell are convergent (This flag indicates that one of the upstream algorithms did converge (COP or CTP) for those cloud EDRs whose algorithms do converge).</td>
<td>3</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
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</tr>
<tr>
<td>0 &lt;= % valid retrievals &lt; 25%</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>25 &lt;= % valid retrievals &lt; 50%</td>
<td>1</td>
<td></td>
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<td></td>
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<tr>
<td>50 &lt;= % valid retrievals &lt; 75%</td>
<td>2</td>
<td></td>
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<tr>
<td>75 &lt;= % valid retrievals &lt;= 100%</td>
<td>3</td>
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<td></td>
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</tr>
<tr>
<td>Pixels with COT &lt; 1.0 in Horizontal Cell &gt; 50%</td>
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<td>MAX_VAL</td>
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<td>1 bit(s)</td>
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</tr>
<tr>
<td>0 &lt;= % valid retrievals &lt; 25%</td>
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<td></td>
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<tr>
<td>25 &lt;= % valid retrievals &lt; 50%</td>
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<td></td>
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<tr>
<td>50 &lt;= % valid retrievals &lt; 75%</td>
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<tr>
<td>75 &lt;= % valid retrievals &lt;= 100%</td>
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<td>MAX_VAL</td>
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<tr>
<td>50 &lt;= % valid retrievals &lt; 75%</td>
<td>2</td>
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<tr>
<td>75 &lt;= % valid retrievals &lt;= 100%</td>
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<td></td>
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<tr>
<td>Ice Cloud Pixels with COT &gt; 10.0 in Horizontal Cell &gt; 50%</td>
<td>7</td>
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<td>MAX_VAL</td>
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<tr>
<td>25 &lt;= % valid retrievals &lt; 50%</td>
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<tr>
<td>50 &lt;= % valid retrievals &lt; 75%</td>
<td>2</td>
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<tr>
<td>75 &lt;= % valid retrievals &lt;= 100%</td>
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### Cloud Fractional Coverage within Horizontal Cell - Water Cloud

<table>
<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>96</td>
<td>96</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
<td>508</td>
<td>508</td>
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#### Datum

<table>
<thead>
<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/Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud Confidence (Indicates cloudiness - percent cloudiness)</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 &lt;= cloudiness &lt; 25%</td>
<td>0</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 &lt;= cloudiness &lt; 50%</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 &lt;= cloudiness &lt; 75%</td>
<td>2</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75 &lt;= cloudiness &lt;= 100%</td>
<td>3</td>
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</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Water Cloud</td>
<td>2</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
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</tr>
<tr>
<td>0 &lt;= Water Cloud Fraction &lt; 25%</td>
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<td></td>
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</tr>
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<td>25 &lt;= Water Cloud Fraction &lt; 50%</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 &lt;= Water Cloud Fraction &lt;= 75%</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
Cloud Fractional Coverage within Horizontal Cell - Multi-Layer Cloud

<table>
<thead>
<tr>
<th>Name</th>
<th>Granule Boundary 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>96</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
<td>508</td>
</tr>
</tbody>
</table>

**Datum**
- **Description**: Overall Quality (Percent of valid retrievals = valid Retrievals / total number of cloudy pixels)
- **Datum Offset**: 0
- **Unscaled Valid Range Min**: MIN_VAL
- **Unscaled Valid Range Max**: MAX_VAL
- **Measurement Units**: unitless
- **Scaled Factor Name**: No
- **Data Type**: 2 bit(s)
- **Fill Values**: Name | Value
  - True: 1
  - False: 0

**Legend Entries**
- 0 <= % valid retrievals < 25%
- 25 <= % valid retrievals < 50%
- 50 <= % valid retrievals < 75%
- 75 <= % valid retrievals <= 100%

Cloud Fractional Coverage within Horizontal Cell - Mixed Phase (Water and Ice) Cloud

<table>
<thead>
<tr>
<th>Name</th>
<th>Granule Boundary 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>96</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
<td>508</td>
</tr>
</tbody>
</table>

**Datum**
- **Description**: Out of bounds - More than 50% of pixels in Horizontal Cell are outside of the system spec valid range.
- **Datum Offset**: 2
- **Unscaled Valid Range Min**: MIN_VAL
- **Unscaled Valid Range Max**: MAX_VAL
- **Measurement Units**: unitless
- **Scaled Factor Name**: No
- **Data Type**: 1 bit(s)
- **Fill Values**: Name | Value
  - True: 1
  - False: 0

**Legend Entries**
- False: 0
- True: 1

Convergent Pixels - More than 50% of pixels in Horizontal Cell are convergent (This flag indicates that one of the upstream algorithms did converge (COP or CTP) for those cloud EDRs whose algorithms do converge).

<table>
<thead>
<tr>
<th>Name</th>
<th>Granule Boundary 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>96</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
<td>508</td>
</tr>
</tbody>
</table>

**Datum**
- **Description**: Pixels with COT < 1.0 in Horizontal Cell > 50%
- **Datum Offset**: 3
- **Unscaled Valid Range Min**: MIN_VAL
- **Unscaled Valid Range Max**: MAX_VAL
- **Measurement Units**: unitless
- **Scaled Factor Name**: No
- **Data Type**: 1 bit(s)
- **Fill Values**: Name | Value
  - False: 0
  - True: 1

**Legend Entries**
- False: 0
- True: 1

Ice Cloud Pixels with COT > 10.0 in Horizontal Cell > 50%

<table>
<thead>
<tr>
<th>Name</th>
<th>Granule Boundary 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>96</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
<td>508</td>
</tr>
</tbody>
</table>

**Datum**
- **Description**: Overall Quality (Percent of valid retrievals = valid Retrievals / total number of cloudy pixels)
- **Datum Offset**: 0
- **Unscaled Valid Range Min**: MIN_VAL
- **Unscaled Valid Range Max**: MAX_VAL
- **Measurement Units**: unitless
- **Scaled Factor Name**: No
- **Data Type**: 2 bit(s)
- **Fill Values**: Name | Value
  - True: 1
  - False: 0

**Legend Entries**
- False: 0
- True: 1

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
**Cloud Effective Particle Size Product Profile - Scale Factors**

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size/Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEPSFactors</td>
<td>4 bytes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Datum</th>
<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/Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Surface Type - Sea Water (Ocean) Fractional Coverage within Horizontal Cell</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>0% &lt;= Sea Water Fraction &lt; 25%</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25% &lt;= Sea Water Fraction &lt; 50%</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50% &lt;= Sea Water Fraction &lt; 75%</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>75% &lt;= Sea Water Fraction &lt;= 100%</td>
<td>3</td>
</tr>
</tbody>
</table>

|       | Surface Type - Coastal Fractional Coverage within Horizontal Cell | 2 | MIN_VAL | MAX_VAL | unitless | No | 2 bit(s) | 0% <= Coastal Fraction < 25% | 0 |
|       | | | | | | | | 25% <= Coastal Fraction < 50% | 1 |
|       | | | | | | | | 50% <= Coastal Fraction < 75% | 2 |
|       | | | | | | | | 75% <= Coastal Fraction <= 100% | 3 |

|       | spare | 4 | MIN_VAL | MAX_VAL | unitless | No | 4 bit(s) | 0% <= Sunglint Fraction < 25% | 0 |
|       | | | | | | | | 25% <= Sunglint Fraction < 50% | 1 |
|       | | | | | | | | 50% <= Sunglint Fraction < 75% | 2 |
|       | | | | | | | | 75% <= Sunglint Fraction <= 100% | 3 |

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
5.1.3.3 Cloud Effective Particle Size HDF5 Details

Figure 5.1.3.3-1, Cloud Effective Particle Size UML Diagram, provides the details on the content and datatypes of the VIIRS Cloud Effective Particle Size EDR. These UML diagrams provide details at the product level only. In addition to these UML diagrams, refer to Figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

<table>
<thead>
<tr>
<th>VIIRS-CEPS-EDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>+AverageCloudEffectiveParticleSize : H5T_NATIVE_USHORT</td>
</tr>
<tr>
<td>+CEPSFactors : H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+LayerCloudEffectiveParticleSize : H5T_NATIVE_USHORT</td>
</tr>
<tr>
<td>+QF1_VIIRSCEPSLAYEREDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF2_VIIRSCEPSLAYEREDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF3_VIIRSCEPSAVGEDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF4_VIIRSCEPSAVGEDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF5_VIIRSCEPSEDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF6_VIIRSCEPSEDR : H5T_NATIVE_UCHAR</td>
</tr>
</tbody>
</table>

Figure: 5.1.3.3-1 Cloud Effective Particle Size UML Diagram

5.1.3.4 Cloud Effective Particle Size HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Cloud Effective Particle Size EDR are listed in 474-00448-02-01, the JPSS Algorithm Specification Vol. II: Data Dictionary for the Common Algorithms. The VIIRS EDR metadata includes all of the common metadata at the root, product, aggregation, and granule levels.

In addition to the common metadata items for this product, Table 5.1.3.4-1, Cloud Effective Particle Size Quality Summary Metadata Values, provides the following items as name/value pairs. The listed name/value pair items in the table are the granule level quality flags for the Cloud Effective Particle Size EDR.

| Table: 5.1.3.4-1 Cloud Effective Particle Size Quality Summary Metadata Values |
|----------------------------------------|-------------|---------------|-------------|
| Name                                    | Value       | Description                                           | Comments                                            |
| Exclusion/Degradation Summary           | 0 - 100     | Percent of cloudy pixels with one or more exclusion or degradation criteria flags |
| Percent Converged Pixels                | 0 - 100     | A ratio (expressed as a percent) of the number of converged vs. that of cloudy pixels for the entire granule. |

5.1.3.5 Cloud Effective Particle Size Geolocation Details

See Section 4.8, VIIRS Cloud Aggregated Geolocation.
## 5.1.4 Cloud Optical Thickness

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>EDRE-VCOT-C0030 (Official) EDRE-VCOT-C0031 (Substitute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description/Purpose</td>
<td>Cloud optical thickness is defined as the extinction (scattering and absorption) vertical optical thickness of each distinguishable cloud layer in a vertical column of the atmosphere as well as the average optical thickness of all layers. Optical thickness, $\tau$, is related to transmittance, $t$, by $t = \exp(-\tau)$. This EDR will be produced from all nominal JPSS orbits, but the measurement accuracy for a terminator orbit will be degraded due to VIIRS calibration limitations for a terminator orbit. The Cloud Optical Thickness EDR is reported for up to four cloud layers (ordered from the Top of Atmosphere to Surface) and will include the averaged cloud optical thickness, integrated vertically per cell. This EDR is reported as the unitless quantity Tau ($\tau$). Sensors: VIIRS Effectivity: S-NPP/JPSS</td>
</tr>
</tbody>
</table>

| File-Naming Construct | See the JPSS CDFCB-X Vol. I, 474-000001-01, Section 3.4 for details. |
| File Size | See Table: 5.1.4.1-1 Cloud Optical Thickness Data Content Summary for size. This granule size includes Cloud Optical Thickness 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 | For each cell, the Cloud Optical Thickness EDR contains: Layer cloud optical thickness Average cloud optical thickness (of all layers)* Quality Flags Scale/Offset Factors *Note: The Average Cloud Optical Thickness Field is a simple average of the Cloud Optical Thickness identified for each cell at each layer. The layers are vertically averaged to provide this field. Be aware that a cell in the Average Cloud Optical Thickness field may contain data averaged from multiple layers widely separated in altitude and therefore very different in cloud type and optical thickness. See Section 5.1.4.1 Cloud Optical Thickness Data Content Summary See Section 5.1.4.2 Cloud Optical Thickness Product Profile See Section 5.1.4.3 Cloud Optical Thickness HDF5 Details See Section 5.1.4.4 Cloud Optical Thickness HDF5 Metadata Details See Section 5.1.4.5 Cloud Optical Thickness Geolocation Details |
5.1.4.1 Cloud Optical Thickness Data Content Summary

Table: 5.1.4.1-1 Cloud Optical Thickness Data Content Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Data Type</th>
<th>Aggregate Dimensions (N = Number of Granules)</th>
<th>Granule Dimensions</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>LayerCloudOpticalThickness</td>
<td>Cloud Optical Thickness - layered product (ordered from top of atmosphere to surface)</td>
<td>unsigned 16-bit integer</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>unitless</td>
</tr>
<tr>
<td>AverageCloudOpticalThickness</td>
<td>Cloud Optical Thickness - Average of all layers</td>
<td>unsigned 16-bit integer</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF1_VIIRSCOTLAYEREDDR</td>
<td>Layer COT Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF2_VIIRSCOTLAYEREDDR</td>
<td></td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF3_VIIRSCOTAVGEDR</td>
<td>Quality Flags for AverageCloudOpticalThickness Field</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF4_VIIRSCOTAVGEDR</td>
<td></td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF5_VIIRSCOTEDR</td>
<td>Non-Cloud Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF6_VIIRSCOTEDR</td>
<td></td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>COTFactors</td>
<td>Scale = first array element; Offset = 2nd array element</td>
<td>32-bit floating point</td>
<td>[N*2]</td>
<td>[2]</td>
<td>unitless</td>
</tr>
</tbody>
</table>

File Size 1,072,904 Bytes

5.1.4.2 Cloud Optical Thickness Product Profile

Table: 5.1.4.2-1 Cloud Optical Thickness Product Profile

Cloud Optical Thickness Product Profile

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
<th>Fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>LayerCloudOpticalThickness</td>
<td>2byte(s)</td>
<td></td>
<td>Name</td>
</tr>
<tr>
<td>AlongTrack</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Layer</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Datum</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Cloud Optical Thickness Product Profile - Quality Flags

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
<th>Name</th>
<th>Granule Boundary</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>QF1_VIIRSCOTLAYERED</td>
<td>1 byte(s)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Fields**

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
<th>Name</th>
<th>Granule Boundary</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud Confidence (Indicates cloudiness - percent cloudiness for this layer)</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Water Cloud</td>
<td>2</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Multi-Layer Cloud</td>
<td>4</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Mixed Phase (Water and Ice) Cloud</td>
<td>6</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
</tr>
</tbody>
</table>
### QF2_VIIRSCOTLAYEREDR

<table>
<thead>
<tr>
<th>Name</th>
<th>Granule Boundary Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>AlongTrack</td>
<td>Yes</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
<tr>
<td>Layer</td>
<td>No</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Datums

<table>
<thead>
<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/Scale Factor</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Quality (Percent of valid retrievals = valid retrievals / total number of cloudy pixels)</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Out of bounds - More than 50% of pixels in Horizontal Cell are outside of the system spec valid range.</td>
<td>2</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Convergent Pixels - More than 50% of pixels in Horizontal Cell are convergent (This flag indicates that one of the upstream algorithms did converge (COP or CTP) for those cloud EDRs whose algorithms do converge).</td>
<td>3</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Pixels with COT &lt; 1.0 in Horizontal Cell &gt; 50%</td>
<td>4</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Spare</td>
<td>5</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Ice Cloud Pixels with COT &gt; 10.0 in Horizontal Cell &gt; 50%</td>
<td>7</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
</tbody>
</table>

### QF3_VIIRSCOTAVGEDR

<table>
<thead>
<tr>
<th>Name</th>
<th>Granule Boundary Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>AlongTrack</td>
<td>Yes</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
</tbody>
</table>

#### Datums

<table>
<thead>
<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/Scale Factor</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud Confidence (Indicates cloudiness - percent cloudiness)</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Water Cloud</td>
<td>2</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Multi-Layer Cloud</td>
<td>4</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
</tbody>
</table>

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Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
Cloud Fractional Coverage within Horizontal Cell - Mixed Phase (Water and Ice) Cloud

### QF4_VIIRSCOTAVGEDR

<table>
<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>96</td>
<td>96</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Datum</th>
<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/Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Quality (Percent of valid retrievals = valid Retrievals / total number of cloudy pixels)</td>
<td>0 &lt;= % valid retrievals &lt; 25%</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>False</td>
<td>False</td>
</tr>
<tr>
<td></td>
<td>25 &lt;= % valid retrievals &lt; 50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>True</td>
<td>False</td>
</tr>
<tr>
<td></td>
<td>50 &lt;= % valid retrievals &lt; 75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>True</td>
<td>False</td>
</tr>
<tr>
<td></td>
<td>75 &lt;= % valid retrievals &lt;= 100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>True</td>
<td>True</td>
</tr>
<tr>
<td>Out of bounds - More than 50% of pixels in Horizontal Cell are outside of the system spec valid range.</td>
<td>2 &lt;= % valid retrievals &lt; 25%</td>
<td>2</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>False</td>
<td>False</td>
</tr>
<tr>
<td></td>
<td>25 &lt;= % valid retrievals &lt; 50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>True</td>
<td>False</td>
</tr>
<tr>
<td></td>
<td>50 &lt;= % valid retrievals &lt; 75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>True</td>
<td>False</td>
</tr>
<tr>
<td></td>
<td>75 &lt;= % valid retrievals &lt;= 100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>True</td>
<td>True</td>
</tr>
<tr>
<td>Convergent Pixels - More than 50% of pixels in Horizontal Cell are convergent (This flag indicates that one of the upstream algorithms did converge (COP or CTP) for those cloud EDRs whose algorithms do converge)</td>
<td>3 &lt;= % valid retrievals &lt; 25%</td>
<td>3</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>False</td>
<td>False</td>
</tr>
<tr>
<td></td>
<td>25 &lt;= % valid retrievals &lt; 50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>True</td>
<td>False</td>
</tr>
<tr>
<td></td>
<td>50 &lt;= % valid retrievals &lt; 75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>True</td>
<td>False</td>
</tr>
<tr>
<td></td>
<td>75 &lt;= % valid retrievals &lt;= 100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>True</td>
<td>True</td>
</tr>
</tbody>
</table>

### QP5_VIIRSCOTEDR

<table>
<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>96</td>
<td>96</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Datum</th>
<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/Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snow/Ice Fraction</td>
<td>0 &lt;= Snow/Ice Fraction &lt; 25%</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>False</td>
<td>False</td>
</tr>
<tr>
<td></td>
<td>25 &lt;= Snow/Ice Fraction &lt; 50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>True</td>
<td>False</td>
</tr>
<tr>
<td></td>
<td>50 &lt;= Snow/Ice Fraction &lt; 75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>True</td>
<td>False</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### Exclusion - Sunglint (Percent of pixels in sunglint in Horizontal Cell)

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excl</td>
<td>2</td>
</tr>
<tr>
<td>MIN</td>
<td>MIN</td>
</tr>
<tr>
<td>MAX</td>
<td>MAX</td>
</tr>
<tr>
<td>unitless</td>
<td>unitless</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2 bit(s)</td>
<td>2 bit(s)</td>
</tr>
<tr>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>0% &lt;= Sunglint Fraction &lt; 25%</td>
<td>0% &lt;= Sunglint Fraction &lt; 25%</td>
</tr>
<tr>
<td>25% &lt;= Sunglint Fraction &lt; 50%</td>
<td>25% &lt;= Sunglint Fraction &lt; 50%</td>
</tr>
<tr>
<td>50% &lt;= Sunglint Fraction &lt; 75%</td>
<td>50% &lt;= Sunglint Fraction &lt; 75%</td>
</tr>
<tr>
<td>75% &lt;= Sunglint Fraction &lt;= 100%</td>
<td>75% &lt;= Sunglint Fraction &lt;= 100%</td>
</tr>
</tbody>
</table>

### Day/Night Degradation Flag

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
<td>4</td>
</tr>
<tr>
<td>MIN</td>
<td>MIN</td>
</tr>
<tr>
<td>MAX</td>
<td>MAX</td>
</tr>
<tr>
<td>unitless</td>
<td>unitless</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2 bit(s)</td>
<td>2 bit(s)</td>
</tr>
<tr>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Day (Solar Zenith Angle &lt; 75 degrees)</td>
<td>Day (Solar Zenith Angle &lt; 75 degrees)</td>
</tr>
<tr>
<td>Night (Solar Zenith Angle &gt;= 75 degrees)</td>
<td>Night (Solar Zenith Angle &gt;= 75 degrees)</td>
</tr>
<tr>
<td>Transition (Terminator)</td>
<td>Transition (Terminator)</td>
</tr>
</tbody>
</table>

### Bad SDR Data (Quality of COT degraded or COT not obtained due to any bad SDR data in Horizontal cell)

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bad</td>
<td>6</td>
</tr>
<tr>
<td>MIN</td>
<td>MIN</td>
</tr>
<tr>
<td>MAX</td>
<td>MAX</td>
</tr>
<tr>
<td>unitless</td>
<td>unitless</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2 bit(s)</td>
<td>2 bit(s)</td>
</tr>
<tr>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Poor</td>
<td>Poor</td>
</tr>
<tr>
<td>No Calibration</td>
<td>No Calibration</td>
</tr>
</tbody>
</table>

### Cloud Optical Thickness Product Profile - Scale Factors

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size/Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>COFA</td>
<td>4 byte(s)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<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 Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Type - Sea Water (Ocean) Fractional Coverage within Horizontal Cell</td>
<td>0</td>
<td>MIN</td>
<td>MAX</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface Type - Coastal Fractional Coverage within Horizontal Cell</td>
<td>2</td>
<td>MIN</td>
<td>MAX</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>spare</td>
<td>4</td>
<td>MIN</td>
<td>MAX</td>
<td>unitless</td>
<td>No</td>
<td>4 bit(s)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
5.1.4.3 *Cloud Optical Thickness HDF5 Details*

Figure 5.1.4.3-1, Cloud Optical Thickness UML Diagram, provides the details on the content and datatypes of the VIIRS Cloud Optical Thickness EDR. These UML diagrams provide details at the product level only. In addition to these UML diagrams, refer to Figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

```
VIIRS-COT-EDR
+AverAgeCloudOpticalThickness : H5T_NATIVE_USHORT
+COTFactors : H5T_NATIVE_FLOAT
+LayerCloudOpticalThickness : H5T_NATIVE_USHORT
+QF1_VIIRSCOTLAYEREDR : H5T_NATIVE_UCHAR
+QF2_VIIRSCOTLAYEREDR : H5T_NATIVE_UCHAR
+QF3_VIIRSCOTAVGEDR : H5T_NATIVE_UCHAR
+QF4_VIIRSCOTAVGEDR : H5T_NATIVE_UCHAR
+QF5_VIIRSCOTEDR : H5T_NATIVE_UCHAR
+QF6_VIIRSCOTEDR : H5T_NATIVE_UCHAR
```

Figure: 5.1.4.3-1  Cloud Optical Thickness UML Diagram

5.1.4.4 *Cloud Optical Thickness HDF5 Metadata Details*

The HDF5 metadata elements associated with the VIIRS Cloud Optical Thickness EDR are listed in 474-00448-02-01, the JPSS Algorithm Specification Vol. II: Data Dictionary for the Common Algorithms. The VIIRS EDR metadata includes all of the common metadata at the root, product, aggregation, and granule levels.

In addition to the common metadata items for this product, Table 5.1.4.4-1, Cloud Optical Thickness Quality Summary Metadata Values, provides the following items as name/value pairs. The listed name/value pair items in the table are the granule level quality flags for the Cloud Optical Thickness EDR.

```
<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusion/Degradation Summary</td>
<td>0 - 100</td>
<td>Percent of cloudy pixels with one or more exclusion or degradation criteria flags</td>
</tr>
<tr>
<td>Percent Converged Pixels</td>
<td>0 - 100</td>
<td>A ratio (expressed as a percent) of the number of converged vs. that of cloudy pixels for the entire granule.</td>
</tr>
</tbody>
</table>
```

Table: 5.1.4.4-1  Cloud Optical Thickness Quality Summary Metadata Values

5.1.4.5 *Cloud Optical Thickness Geolocation Details*

See Section 4.8, VIIRS Cloud Aggregated Geolocation.
5.1.5 Cloud Top Height

| Data Mnemonic         | EDRE-VCTH-C0030 (Official)  
|                       | EDRE-VCTH-C0031 (Substitute) |
| Description/Purpose   | The cloud top height is defined for each cloud-covered earth location as the set of heights of the tops of the cloud layers overlying the location. The reported heights are horizontal spatial averages over a cell (i.e., a square region of the earth’s surface). If a cloud layer does not extend over an entire cell, the spatial average is limited to the portion of the cell that is covered by the layer. The cloud top height is not defined or reported for cells that are categorized as “probably clear” or “confidently clear” by more than half of the cloud mask elements that cover the cloud top height horizontal cell. Note that although standard meteorological convention is to provide cloud heights Above Ground Level (AGL), the Cloud Top Height is provided as the height above Mean Sea Level (MSL). |
| Sensors: VIIRS       | Effectivity: S-NPP/JPSS |

| File-Naming Construct | See the JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4 for details. |

| File Size             | See Table: 5.1.5.1-1 Cloud Top Height Data Content Summary for size. This granule size includes Cloud Top Height 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 |

For each cell, the Cloud Top Height EDR contains:
- Layer cloud top height
- Average cloud top height (of all layers)*
- Quality Flags
- Scale/Offset Factors

*Note: The Average Cloud Top Height Field is a simple average of the Cloud Top Heights identified for each cell at each layer. The layers are vertically averaged to provide this field. Be aware that a cell in the Average Cloud Top Height field may contain data averaged from multiple layers widely separated in altitude and therefore very different in cloud top heights. See Section 5.1.5.1 Cloud Top Height Data Content Summary
See Section 5.1.5.2 Cloud Top Height Product Profile
See Section 5.1.5.3 Cloud Top Height HDF5 Details
See Section 5.1.5.4 Cloud Top Height HDF5 Metadata Details
See Section 5.1.5.5 Cloud Top Height Geolocation Details
5.1.5.1 Cloud Top Height Data Content Summary

Table: 5.1.5.1-1 Cloud Top Height Data Content Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Data Type</th>
<th>Aggregate Dimensions (N = Number of Granules)</th>
<th>Granule Dimensions</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>LayerCloudTopHeight</td>
<td>Cloud Top Height - layered product (ordered from top of atmosphere to surface)</td>
<td>unsigned 16-bit integer</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>km</td>
</tr>
<tr>
<td>AverageCloudTopHeight</td>
<td>Cloud Top Height - Average of all layers</td>
<td>unsigned 16-bit integer</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>km</td>
</tr>
<tr>
<td>QF1_VIIRSCTHLAYEREDR</td>
<td>Layer CTH Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF2_VIIRSCTHLAYEREDR</td>
<td>Quality Flags for AverageCloudTopHeight Field</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF3_VIIRSCTHAVGEDR</td>
<td>Quality Flags for AverageCloudTopHeight Field</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF4_VIIRSCTHAVGEDR</td>
<td>Non-Cloud Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF6_VIIRSCTHEDR</td>
<td>Non-Cloud Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>CTHFactors</td>
<td>Scale = first array element; Offset = 2nd array element</td>
<td>32-bit floating point</td>
<td>[N*2]</td>
<td></td>
<td>Scale = unitless; Offset = km</td>
</tr>
</tbody>
</table>

File Size 1,072,904 Bytes

5.1.5.2 Cloud Top Height Product Profile

Table: 5.1.5.2-1 Cloud Top Height Product Profile

Cloud Top Height Product Profile

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>LayerCloudTopHeight</td>
<td>2byte(s)</td>
<td>Name Granule Boundary Dynamic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AlongTrack</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CrossTrack</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Layer</td>
</tr>
</tbody>
</table>

Datum

<table>
<thead>
<tr>
<th>Description</th>
<th>Datum</th>
<th>Offset</th>
<th>Unscaled Valid Range Min</th>
<th>Unscaled Valid Range Max</th>
<th>Measurement Units</th>
<th>Scaled</th>
<th>Scale Factor</th>
<th>Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud Top Height - layered product (ordered from top of atmosphere to surface)</td>
<td>0</td>
<td>-1.00</td>
<td>20.00</td>
<td>km</td>
<td>Yes</td>
<td>CTHFactors</td>
<td>unsigned 16-bit integer</td>
<td>Name</td>
<td>Value</td>
<td>NA_UINT16_FILL</td>
<td>Name/Value</td>
</tr>
</tbody>
</table>
### AverageCloudTopHeight 2byte(s)

<table>
<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>96</td>
<td>96</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
</tbody>
</table>

### Datum

<table>
<thead>
<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>
</table>
### QP2_VIIRSCTHLAYEREDR

<table>
<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>96</td>
<td>96</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
<tr>
<td>Layer</td>
<td>No</td>
<td>No</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Datum Description

<table>
<thead>
<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 Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Quality (Percent of valid retrievals = valid Retrievals / total number of cloudy pixels)</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>True/False</td>
</tr>
<tr>
<td>Out of bounds - More than 50% of pixels in Horizontal Cell are outside of the system spec valid range.</td>
<td>2</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>True/False</td>
</tr>
<tr>
<td>Convergent Pixels - More than 50% of pixels in Horizontal Cell are convergent (This flag indicates that one of the upstream algorithms did converge (COP or CTP) for those cloud EDRs whose algorithms do converge).</td>
<td>3</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>True/False</td>
</tr>
<tr>
<td>Pixels with COT &lt; 1.0 in Horizontal Cell &gt; 50%</td>
<td>4</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>True/False</td>
</tr>
<tr>
<td>Opaque (black) cloud branching</td>
<td>5</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>True/False</td>
</tr>
<tr>
<td>Ice Cloud Pixels with COT &gt; 10.0 in Horizontal Cell &gt; 50%</td>
<td>7</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 bit(s)</td>
<td>Name/Value</td>
<td>True/False</td>
</tr>
</tbody>
</table>

### QP3_VIIRSCTHAVGEDR

<table>
<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>96</td>
<td>96</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
</tbody>
</table>

#### Datum Description

<table>
<thead>
<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 Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud Confidence (Indicates cloudiness - percent cloudiness)</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>True/False</td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Water Cloud</td>
<td>2</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>True/False</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at [https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm](https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm) to verify that this is the correct version prior to use.
### Cloud Fractional Coverage within Horizontal Cell - Multi-Layer Cloud

<table>
<thead>
<tr>
<th>Name</th>
<th>MIN_VAL</th>
<th>MAX_VAL</th>
<th>units</th>
<th>Value</th>
<th>2 bit(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud Fraction</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
</tr>
</tbody>
</table>

#### QF4_VIIRSCTHAVGEDR 1 byte(s)

<table>
<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>Along Track</td>
<td>Yes</td>
<td>No</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>Cross Track</td>
<td>No</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
</tbody>
</table>

#### Datum Description

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Overall Quality (Percent of valid retrievals = valid Retrievals / total number of cloudy pixels)</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>Out of bounds - More than 50% of pixels in Horizontal Cell are outside of the system spec valid range.</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>Convergent Pixels - More than 50% of pixels in Horizontal Cell are convergent (This flag indicates that one of the upstream algorithms did converge (COP or CTP) for those cloud EDRs whose algorithms do converge).</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>Pixels with COT &lt; 1.0 in Horizontal Cell &gt; 50%</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>Opaque (black) cloud branching</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>Ice Cloud Pixels with COT &gt; 10.0 in Horizontal Cell &gt; 50%</td>
<td>No</td>
</tr>
</tbody>
</table>

### Cloud Fractional Coverage within Horizontal Cell - Mixed Phase (Water and Ice) Cloud

<table>
<thead>
<tr>
<th>Name</th>
<th>MIN_VAL</th>
<th>MAX_VAL</th>
<th>units</th>
<th>Value</th>
<th>2 bit(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud Fraction</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
</tr>
</tbody>
</table>

#### QF5_VIIRSCTHEDR 1 byte(s)

<table>
<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>Along Track</td>
<td>Yes</td>
<td>No</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>Cross Track</td>
<td>No</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
</tbody>
</table>

#### Datum Description

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Overall Quality (Percent of valid retrievals = valid Retrievals / total number of cloudy pixels)</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>Out of bounds - More than 50% of pixels in Horizontal Cell are outside of the system spec valid range.</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>Convergent Pixels - More than 50% of pixels in Horizontal Cell are convergent (This flag indicates that one of the upstream algorithms did converge (COP or CTP) for those cloud EDRs whose algorithms do converge).</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>Pixels with COT &lt; 1.0 in Horizontal Cell &gt; 50%</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>Opaque (black) cloud branching</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>Ice Cloud Pixels with COT &gt; 10.0 in Horizontal Cell &gt; 50%</td>
<td>No</td>
</tr>
</tbody>
</table>

---

Check the JPSS MIS Server at [https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm](https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm) to verify that this is the correct version prior to use.
### Datum

<table>
<thead>
<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/Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snow/Ice Fraction</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>Value</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0% &lt;= Snow/Ice Fraction &lt; 25%</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25% &lt;= Snow/Ice Fraction &lt; 50%</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50% &lt;= Snow/Ice Fraction &lt; 75%</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>75% &lt;= Snow/Ice Fraction &lt;= 100%</td>
<td>3</td>
</tr>
<tr>
<td>Exclusion - Sunglint (Percent of pixels in sunglint in Horizontal Cell)</td>
<td>2</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>Value</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0% &lt;= Sunglint Fraction &lt; 25%</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25% &lt;= Sunglint Fraction &lt; 50%</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50% &lt;= Sunglint Fraction &lt; 75%</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>75% &lt;= Sunglint Fraction &lt;= 100%</td>
<td>3</td>
</tr>
<tr>
<td>Day/Night Degradation Flag</td>
<td>4</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>Value</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Day (Solar Zenith Angle &lt; 75 degrees)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Night (Solar Zenith Angle &gt;= 75 degrees)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Transition (Terminator)</td>
<td>3</td>
</tr>
<tr>
<td>Bad SDR Data (Quality of CTH degraded or CTH not obtained due to any bad SDR data in Horizontal cell)</td>
<td>6</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bit(s)</td>
<td>Name/Value</td>
<td>Value</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Good</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Poor</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No Calibration</td>
<td>2</td>
</tr>
</tbody>
</table>

#### Cloud Top Height Product Profile - Scale Factors

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTHFactors</td>
<td>4 bytes</td>
<td>Granule Boundary Dynamic Min Array Size Max Array Size</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### Datum Description Table

<table>
<thead>
<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>Scale</th>
<th>Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale = first array element; Offset = 2nd array element</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>Scale = unitless, Offset = km</td>
<td>No</td>
<td></td>
<td>32-bit floating point</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
</tbody>
</table>
5.1.5.3 *Cloud Top Height HDF5 Details*

Figure 5.1.5.3-1, Cloud Top Height UML Diagram, provides the details on the content and datatypes of the Cloud Top Height EDR. These UML diagrams provide details at the product level only. In addition to these UML diagrams, refer to Figure 3.2-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

<table>
<thead>
<tr>
<th>VIIRS-CTH-EDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>+AverageCloudTopHeight : H5T_NATIVE_USHORT</td>
</tr>
<tr>
<td>+CTHFactors : H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+LayerCloudTopHeight : H5T_NATIVE_USHORT</td>
</tr>
<tr>
<td>+QF1_VIIRSCOTHAYEREDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF2_VIIRSCOTHAYEREDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF3_VIIRSCTHAVGEDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF4_VIIRSCTHAVGEDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF5_VIIRSC区域EDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF6_VIIRSC区域EDR : H5T_NATIVE_UCHAR</td>
</tr>
</tbody>
</table>

**Figure: 5.1.5.3-1 Cloud Top Height UML Diagram**

5.1.5.4 *Cloud Top Height HDF5 Metadata Details*

The HDF5 metadata elements associated with the Cloud Top Height EDR are listed in 474-00448-02-01, the JPSS Algorithm Specification Vol. II: Data Dictionary for the Common Algorithms. The Cloud Top Height EDR metadata includes all of the common metadata at the root, product, aggregation, and granule levels.

In addition to the common metadata items for this product, Table 5.1.5.4-1, Cloud Top Height Quality Summary Metadata Values, provides the following items as name/value pairs. The listed name/value pair items in the table are the granule level quality flags for the VIIRS Cloud Top Height EDR.

| **Table: 5.1.5.4-1 Cloud Top Height Quality Summary Metadata Values** |
|--------------------------|-------------------|-------------------|----------|
| Name                     | Value             | Description                                  | Comments |
| Exclusion/Degradation Summary | 0 - 100 | Percent of cloudy pixels with one or more exclusion or degradation criteria flags | |
| Percent Converged Pixels  | 0 - 100 | A ratio (expressed as a percent) of the number of converged vs. that of cloudy pixels for the entire granule. | |

5.1.5.5 *Cloud Top Height Geolocation Details*

See Section 4.8, VIIRS Cloud Aggregated Geolocation

5.1.6 *Cloud Top Pressure*

| Data Mnemonic | EDRE-VCTP-C0030 (Official) |

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
| Description/Purpose | The cloud top pressure is defined for each cloud-covered earth location as the set of atmospheric pressures at the tops of the cloud layers overlying the location. The reported pressures are horizontal spatial averages over a cell (i.e., a square region of the earth’s surface). If a cloud layer does not extend over an entire cell, then that spatial average is limited to the portion of the cell that is covered by the layer. Cloud top pressure is not defined or reported for clear cells. The Cloud Top Pressure EDR is reported for up to four layers. The data is reported in units of mb. Sensors: VIIRS Effectivity: S-NPP/JPSS |
| File-Naming Construct | See the JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4 for details. |
| File Size | See Table: 5.1.6-1 Cloud Top Pressure Data Content Summary for size. This granule size includes Cloud Top Pressure 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 | For each cell, the Cloud Top Pressure EDR contains: Layer cloud top pressure Average cloud top pressure* Quality Flags Scale/Offset Factors *Note: The Average Cloud Top Pressure Field is a simple average of the Cloud Top Pressures identified for each cell at each layer. The layers are vertically averaged to provide this field. Be aware that a cell in the Average Cloud Top Pressure field may contain data averaged from multiple layers widely separated in altitude and therefore very different in cloud top pressures. See Section 5.1.6.1 Cloud Top Pressure Data Content Summary See Section 5.1.6.2 Cloud Top Pressure Product Profile See Section 5.1.6.3 Cloud Top Pressure HDF5 Details See Section 5.1.6.4 Cloud Top Pressure HDF5 Metadata Details See Section 5.1.6.5 Cloud Top Pressure Geolocation Details |

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
## 5.1.6.1 Cloud Top Pressure Data Content Summary

### Table: 5.1.6-1 Cloud Top Pressure Data Content Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Data Type</th>
<th>Aggregate Dimensions (N = Number of Granules)</th>
<th>Granule Dimensions</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>LayerCloudTopPressure</td>
<td>Cloud Top Pressure - layered product (ordered from top of atmosphere to surface)</td>
<td>unsigned 16-bit integer</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>hPa</td>
</tr>
<tr>
<td>AverageCloudTopPressure</td>
<td>Cloud Top Pressure - Average of all layers</td>
<td>unsigned 16-bit integer</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>hPa</td>
</tr>
<tr>
<td>QF1_VIIRSCTPLAYEREDR</td>
<td>Layer CTP Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF2_VIIRSCTPLAYEREDR</td>
<td>Quality Flags for AverageCloudTopPressure Field</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF3_VIIRSCTPAVGEDR</td>
<td>Quality Flags for AverageCloudTopPressure Field</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF4_VIIRSCTPAVGEDR</td>
<td>Non-Cloud Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF5_VIIRSCTPEDR</td>
<td>Non-Cloud Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF6_VIIRSCTPEDR</td>
<td>Non-Cloud Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>CTPFactors</td>
<td>Scale = first array element; Offset = 2nd array element</td>
<td>32-bit floating point</td>
<td>[N*2]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**File Size**: 1,072,904 Bytes

## 5.1.6.2 Cloud Top Pressure Product Profile

### Table: 5.1.6.2-1 Cloud Top Pressure Product Profile

**Cloud Top Pressure Product Profile**

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>LayerCloudTopPressure</td>
<td>2byte(s)</td>
<td></td>
</tr>
</tbody>
</table>

**Fields**

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Type</th>
<th>Fill Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LayerCloudTopPressure</td>
<td>16-bit integer</td>
<td>NA_UINT16_FILL</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### Average Cloud Top Pressure

<table>
<thead>
<tr>
<th>Name</th>
<th>Granule Boundary Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Along Track</td>
<td>Yes</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>Cross Track</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
</tbody>
</table>

#### Datum

<table>
<thead>
<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>Cloud Top Pressure - Average of all layers</td>
<td>0</td>
<td>50.00</td>
<td>1050.00</td>
<td>hPa</td>
<td>Yes</td>
<td>CTPFactors</td>
<td>unsigned 16-bit integer</td>
<td>MISS_UINT16_FILL</td>
<td>65534</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ERR_UINT16_FILL</td>
<td>65531</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ELLIPSOID_UINT16_FILL</td>
<td>65530</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VDNE_UINT16_FILL</td>
<td>65529</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>S0UB_UINT16_FILL</td>
<td>65528</td>
</tr>
</tbody>
</table>

### Cloud Top Pressure Product Profile - Quality Flags

#### Name: QF1_VIRSCTPLAYEREDR (1 byte)

<table>
<thead>
<tr>
<th>Name</th>
<th>Granule Boundary Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Along Track</td>
<td>Yes</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>Cross Track</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
<tr>
<td>Layer</td>
<td>No</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Datum

<table>
<thead>
<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>Cloud Confidence (Indicates cloudiness - percent cloudiness for this layer)</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td></td>
<td>2 bit(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Water Cloud</td>
<td>2</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td></td>
<td>2 bit(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Multi-Layer Cloud</td>
<td>4</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td></td>
<td>2 bit(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Mixed Phase (Water and Ice) Cloud</td>
<td>6</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td></td>
<td>2 bit(s)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Legend Entries

- **Cloud Confidence**
  - 0% <= cloudiness < 25%: 0
  - 25% <= cloudiness < 50%: 1
  - 50% <= cloudiness < 75%: 2
  - 75% <= cloudiness <= 100%: 3

- **Cloud Fractional Coverage**
  - Water Cloud: 0
  - Multi-Layer Cloud: 1
  - Mixed Phase (Water and Ice) Cloud: 2

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### Cloud Fractional Coverage within Horizontal Cell - Multi-Layer Cloud

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN_VAL</td>
<td>4</td>
</tr>
<tr>
<td>MAX_VAL</td>
<td>4</td>
</tr>
<tr>
<td>unitless</td>
<td>No</td>
</tr>
<tr>
<td>bits</td>
<td>2</td>
</tr>
</tbody>
</table>

### Cloud Fractional Coverage within Horizontal Cell - Mixed Phase (Water and Ice) Cloud

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN_VAL</td>
<td>6</td>
</tr>
<tr>
<td>MAX_VAL</td>
<td>6</td>
</tr>
<tr>
<td>unitless</td>
<td>No</td>
</tr>
<tr>
<td>bits</td>
<td>2</td>
</tr>
</tbody>
</table>

### Out of bounds - More than 50% of pixels in Horizontal Cell are outside of the system spec valid range.

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN_VAL</td>
<td>2</td>
</tr>
<tr>
<td>MAX_VAL</td>
<td>2</td>
</tr>
<tr>
<td>unitless</td>
<td>No</td>
</tr>
<tr>
<td>bits</td>
<td>1</td>
</tr>
</tbody>
</table>

### Convergent Pixels - More than 50% of pixels in Horizontal Cell are convergent (This flag indicates that one of the upstream algorithms did converge (COP or CTP) for those cloud EDRs whose algorithms do converge).

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN_VAL</td>
<td>3</td>
</tr>
<tr>
<td>MAX_VAL</td>
<td>3</td>
</tr>
<tr>
<td>unitless</td>
<td>No</td>
</tr>
<tr>
<td>bits</td>
<td>1</td>
</tr>
</tbody>
</table>

### Pixels with COT > 1.0 in Horizontal Cell > 50%

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN_VAL</td>
<td>4</td>
</tr>
<tr>
<td>MAX_VAL</td>
<td>4</td>
</tr>
<tr>
<td>unitless</td>
<td>No</td>
</tr>
<tr>
<td>bits</td>
<td>1</td>
</tr>
</tbody>
</table>

### Opaque (black) cloud branching

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN_VAL</td>
<td>5</td>
</tr>
<tr>
<td>MAX_VAL</td>
<td>5</td>
</tr>
<tr>
<td>unitless</td>
<td>No</td>
</tr>
<tr>
<td>bits</td>
<td>2</td>
</tr>
</tbody>
</table>

### Ice Cloud Pixels with COT > 10.0 in Horizontal Cell > 50%

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN_VAL</td>
<td>7</td>
</tr>
<tr>
<td>MAX_VAL</td>
<td>7</td>
</tr>
<tr>
<td>unitless</td>
<td>No</td>
</tr>
<tr>
<td>bits</td>
<td>1</td>
</tr>
</tbody>
</table>

---

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### Snow/Ice Fraction

<table>
<thead>
<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 Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>0% &lt;= Snow/Ice Fraction &lt; 25%</td>
<td>0</td>
<td>MIN.VAL</td>
<td>MAX.VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bits</td>
<td>Name/Value</td>
<td>Value</td>
</tr>
<tr>
<td>25% &lt;= Snow/Ice Fraction &lt; 50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>50% &lt;= Snow/Ice Fraction &lt; 75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>75% &lt;= Snow/Ice Fraction &lt;= 100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

### Exclusion - Sunglint (Percent of pixels in sunglint in Horizontal Cell)

<table>
<thead>
<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 Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>0% &lt;= Sunglint Fraction &lt; 25%</td>
<td>2</td>
<td>MIN.VAL</td>
<td>MAX.VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bits</td>
<td>Name/Value</td>
<td>Value</td>
</tr>
<tr>
<td>25% &lt;= Sunglint Fraction &lt; 50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>50% &lt;= Sunglint Fraction &lt; 75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>75% &lt;= Sunglint Fraction &lt;= 100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

### Day/Night Degradation Flag

<table>
<thead>
<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 Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day (Solar Zenith Angle &lt; 75 degrees)</td>
<td>4</td>
<td>MIN.VAL</td>
<td>MAX.VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bits</td>
<td>Name/Value</td>
<td>Value</td>
</tr>
<tr>
<td>Night (Solar Zenith Angle &gt;= 75 degrees)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Transition ( Terminator)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

### Bad SDR Data (Quality of CTP degraded or CTP not obtained due to any bad SDR data in Horizontal cell)

<table>
<thead>
<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 Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td></td>
<td>MIN.VAL</td>
<td>MAX.VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 bits</td>
<td>Name/Value</td>
<td>Value</td>
</tr>
<tr>
<td>Poor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>No Calibration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

### Cloud Top Pressure Product Profile - Scale Factors

#### Fields

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTPFactors</td>
<td>4 bytes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
<table>
<thead>
<tr>
<th>Datum</th>
<th>Datum Offset</th>
<th>Unscaled Valid Range Min</th>
<th>Unscaled Valid Range Max</th>
<th>Measurement Units</th>
<th>Scaled Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale = first array element; Offset = 2nd array element</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>Scale = unitless; Offset = hPa</td>
<td>No</td>
<td>32-bit floating point</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
5.1.6.3 Cloud Top Pressure HDF5 Details

Figure 5.1.6.3-1, Cloud Top Pressure UML Diagram, provides the details on the content and datatypes of the Cloud Top Pressure EDR. These UML diagrams provide details at the product level only. In addition to these UML diagrams, refer to Figure 3.2-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

<table>
<thead>
<tr>
<th>VIIRS-CTP-EDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>+AverageCloudTopPressure : H5T_NATIVE_USHORT</td>
</tr>
<tr>
<td>+CTPFactors : H5T_NATIVE_FLOAT</td>
</tr>
<tr>
<td>+LayerCloudTopPressure : H5T_NATIVE_USHORT</td>
</tr>
<tr>
<td>+QF1_VIIRSCTPLAYEREDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF2_VIIRSCTPLAYEREDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF3_VIIRSCTPAVGEDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF4_VIIRSCTPAVGEDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF5_VIIRSCTPEDR : H5T_NATIVE_UCHAR</td>
</tr>
<tr>
<td>+QF6_VIIRSCTPEDR : H5T_NATIVE_UCHAR</td>
</tr>
</tbody>
</table>

Figure: 5.1.6.3-1 Cloud Top Pressure UML Diagram

5.1.6.4 Cloud Top Pressure HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Cloud Top Pressure EDR are listed in 474-00448-02-01, the JPSS Algorithm Specification Vol. II: Data Dictionary for the Common Algorithms. The VIIRS Cloud Top Pressure EDR metadata includes all of the common metadata at the root, product, aggregation, and granule levels.

In addition to the common metadata items for this product, Table 5.1.6.4-1, Cloud Top Pressure Quality Summary Metadata Values, provides the following items as name/value pairs. The listed name/value pair items in the table are the granule level quality flags for the Cloud Top Pressure EDR.

| Table: 5.1.6.4-1 Cloud Top Pressure Quality Summary Metadata Values |
|------------------------|-----------------|-----------------|-----------------|
| Name                  | Value           | Description                                             | Comments |
| Exclusion/Degradation Summary | 0 - 100        | Percent of cloudy pixels with one or more exclusion or degradation criteria flags | |
| Percent Converged Pixels | 0 - 100        | A ratio (expressed as a percent) of the number of converged vs. that of cloudy pixels for the entire granule. | |

5.1.6.5 Cloud Top Pressure Geolocation Details

See Section 4.8, VIIRS Cloud Aggregated Geolocation.

5.1.7 Cloud Top Temperature

| Data Mnemonic | EDRE-VCTT-C0030 (Official) |

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
The cloud top temperature is defined for each cloud-covered earth location as the set of atmospheric temperatures at the tops of the cloud layers overlying the location. The reported temperatures are horizontal spatial averages over a cell (i.e., a square region of the earth’s surface).

If a cloud layer does not extend over an entire cell, the spatial average is limited to the portion of the cell that is covered by the layer.

Cloud top temperature is not defined or reported for clear cells. The Cloud Top Temperature EDR is reported for up to four layers. The reporting range is 180 to 310 Kelvin. This product is reported in Kelvin.

Sensors: VIIRS
Effectivity: S-NPP/JPSS

See the JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4 for details.

File Size
See Table: 5.1.7.1-1 Cloud Top Temperature Data Content Summary for size. This granule size includes Cloud Top Temperature 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

For each cell, the Cloud Top Temperature EDR contains:
- Layer cloud top temperature
- Average cloud top temperature*
- Quality Flags
- Scale/Offset

*Note: The Average Cloud Top Height Field is a simple average of the Cloud Top Temperatures identified for each cell at each layer. The layers are vertically averaged to provide this field. Be aware that a cell in the Average Cloud Top Temperature field may contain data averaged from multiple layers widely separated in altitude and therefore very different in cloud top temperatures.

See Section 5.1.7.1 Cloud Top Temperature Data Content Summary
See Section 5.1.7.2 Cloud Top Temperature Product Profile
See Section 5.1.7.3 Cloud Top Temperature HDF5 Details
See Section 5.1.7.4 Cloud Top Temperature HDF5 Metadata Details
See Section 5.1.7.5 Cloud Top Temperature Geolocation Details
### 5.1.7.1 Cloud Top Temperature Data Content Summary

#### Table: 5.1.7.1-1 Cloud Top Temperature Data Content Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Data Type</th>
<th>Aggregate Dimensions (N = Number of Granules)</th>
<th>Granule Dimensions</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>LayerCloudTopTemperature</td>
<td>Cloud Top Temperature - layered product (ordered from top of atmosphere to surface)</td>
<td>unsigned 16-bit integer</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>Kelvin</td>
</tr>
<tr>
<td>AverageCloudTopTemperature</td>
<td>Cloud Top Temperature - Average of all layers</td>
<td>unsigned 16-bit integer</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>Kelvin</td>
</tr>
<tr>
<td>QF1_VIIRSCTTLAYEREDR</td>
<td>Layer CTT Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF2_VIIRSCTTLAYEREDR</td>
<td></td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508, 4]</td>
<td>[96, 508, 4]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF3_VIIRSCTTAVGEDR</td>
<td>Quality Flags for AverageCloudTopTemperature Field</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF4_VIIRSCTTAVGEDR</td>
<td></td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF5_VIIRSCTTLEDREDR</td>
<td>Non-Cloud Quality Flags</td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>QF6_VIIRSCTTLEDREDR</td>
<td></td>
<td>unsigned 8-bit char</td>
<td>[N*96, 508]</td>
<td>[96, 508]</td>
<td>unitless</td>
</tr>
<tr>
<td>CTTFactors</td>
<td>Scale = first array element; Offset = 2nd array element</td>
<td>32-bit floating point</td>
<td>[N*2]</td>
<td>[2]</td>
<td>Scale = unitless; Offset = Kelvin</td>
</tr>
</tbody>
</table>

**File Size**: 1,072,904 Bytes

### 5.1.7.2 Cloud Top Temperature Product Profile

#### Table: 5.1.7.2-1 Cloud Top Temperature Product Profile

<table>
<thead>
<tr>
<th>Cloud Top Temperature Product Profile</th>
<th>Fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Data Size</td>
</tr>
<tr>
<td>LayerCloudTopTemperature</td>
<td>2byte(s)</td>
</tr>
</tbody>
</table>
Cloud Top Temperature Product Profile - Quality Flags

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>QFY_VIIRSCTTLAYERED_12B</td>
<td>1 byte(s)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Granule Boundary Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>AlongTrack Yes</td>
<td>No</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>CrossTrack No</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
<tr>
<td>Layer No</td>
<td>No</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Datum Description</th>
<th>Datum Offset</th>
<th>Unscaled Valid Range Min</th>
<th>Unscaled Valid Range Max</th>
<th>Measurement Units</th>
<th>Scaled/Scale Factor Name</th>
<th>Data Type</th>
<th>Fill Values</th>
<th>Legend Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud Top Temperature - layered product (ordered from top of atmosphere to surface)</td>
<td>0</td>
<td>180.00</td>
<td>343.00</td>
<td>Kelvin</td>
<td>Yes</td>
<td>CTTFactors</td>
<td>unsigned 16-bit integer</td>
<td></td>
</tr>
<tr>
<td>Cloud Top Temperature - Average of all layers</td>
<td>0</td>
<td>180.00</td>
<td>343.00</td>
<td>Kelvin</td>
<td>Yes</td>
<td>CTTFactors</td>
<td>unsigned 16-bit integer</td>
<td></td>
</tr>
<tr>
<td>Cloud Confidence (Indicates cloudiness - percent cloudiness for this layer)</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 byte(s)</td>
<td>Name/Value</td>
<td></td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Water Cloud</td>
<td>2</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 byte(s)</td>
<td>Name/Value</td>
<td></td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Multi-Layer Cloud</td>
<td>4</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 byte(s)</td>
<td>Name/Value</td>
<td></td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
Cloud Fractional Coverage within Horizontal Cell - Mixed Phase (Water and Ice) Cloud

<table>
<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>96</td>
<td>96</td>
</tr>
<tr>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
<tr>
<td>Layer</td>
<td>No</td>
<td>No</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

**Datum Description**

**Overall Quality (Percent of valid retrievals = valid Retrievals / total number of cloudy pixels)**

<table>
<thead>
<tr>
<th>Place</th>
<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></td>
<td>AlongTrack</td>
<td>Yes</td>
<td>No</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
<td>508</td>
<td>508</td>
</tr>
<tr>
<td></td>
<td>Layer</td>
<td>No</td>
<td>No</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

**Legend Entries**

- **Value**
  - 0 <= % valid retrievals < 25%
  - 25% <= % valid retrievals < 50%
  - 50% <= % valid retrievals < 75%
  - 75% <= % valid retrievals <= 100%

- **Fill Values**
  - False: 0
  - True: 1

**Cloud Confidence (Indicates cloudiness - percent cloudiness)**

<table>
<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></td>
<td>AlongTrack</td>
<td>Yes</td>
<td>No</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>CrossTrack</td>
<td>No</td>
<td>No</td>
<td>508</td>
</tr>
<tr>
<td></td>
<td>Layer</td>
<td>No</td>
<td>No</td>
<td>4</td>
</tr>
</tbody>
</table>

**Legend Entries**

- **Value**
  - 0% <= cloudiness < 25%
  - 25% <= cloudiness < 50%
  - 50% <= cloudiness < 75%
  - 75% <= cloudiness <= 100%

- **Fill Values**
  - False: 0
  - True: 1

---

Check the JPSS MIS Server at [https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm](https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm) to verify that this is the correct version prior to use.
<table>
<thead>
<tr>
<th>Cloud Fractional Coverage within Horizontal Cell - Water Cloud</th>
<th>MIN_VAL</th>
<th>MAX_VAL</th>
<th>unitless</th>
<th>No</th>
<th>2 btd(s)</th>
<th>Name/Value</th>
<th>Name/Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Multi-Layer Cloud</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 btd(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Cloud Fractional Coverage within Horizontal Cell - Mixed Phase (Water and Ice) Cloud</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 btd(s)</td>
<td>Name/Value</td>
<td>Name/Value</td>
</tr>
<tr>
<td>QF4_VIIRS_CTT_AVGEDR</td>
<td>1byte(s)</td>
<td>Name</td>
<td>Granule Boundary Dynamic Min Array Size</td>
<td>Max Array Size</td>
<td>AlongTrack</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Datum Description</td>
<td>Datum Offset</td>
<td>Unscaled Valid Range Min</td>
<td>Unscaled Valid Range Max</td>
<td>Measurement Units</td>
<td>Scaled Scale Factor Name</td>
<td>Data Type</td>
<td>Fill Values</td>
</tr>
<tr>
<td>Overall Quality (Percent of valid retrievals = valid Retrievals / total number of cloudy pixels)</td>
<td>0</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 btd(s)</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Out of bounds - More than 50% of pixels in Horizontal Cell are outside of the system spec valid range.</td>
<td>2</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 btd(s)</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Convergent Pixels - More than 50% of pixels in Horizontal Cell are convergent (This flag indicates that one of the upstream algorithms did converge (COP or CTP) for those cloud EDRs whose algorithms do converge).</td>
<td>3</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 btd(s)</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Pixels with COT &lt; 1.0 in Horizontal Cell &gt; 50%</td>
<td>4</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>1 btd(s)</td>
<td>Name/Value</td>
</tr>
<tr>
<td>Opaque (black) cloud branching</td>
<td>5</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
<td>2 btd(s)</td>
<td>Name/Value</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
Cloud Top Temperature Product Profile - Scale Factors

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Size</th>
<th>Dimensions</th>
<th>Granule Boundary</th>
<th>Dynamic</th>
<th>Min Array Size</th>
<th>Max Array Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTTFactors</td>
<td>4 byte(s)</td>
<td>Name</td>
<td>MIN_VAL</td>
<td>MAX_VAL</td>
<td>unitless</td>
<td>No</td>
</tr>
</tbody>
</table>

50% <= Coastal Fraction < 75% 2
75% <= Coastal Fraction <= 100% 3

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
5.1.7.3 Cloud Top Temperature HDF5 Details

Figure 5.1.7.3-1, Cloud Top Temperature UML Diagram, provides the details on the content and datatypes of the Cloud Top Temperature EDR. These UML diagrams provide details at the product level only. In addition to these UML diagrams, refer to Figure 3.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

<table>
<thead>
<tr>
<th>VIIRS-CTT-EDR</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>+AverageCloudTopTemperature: H5T_NATIVE_USHORT</td>
<td></td>
</tr>
<tr>
<td>+CTTFactors: H5T_NATIVE_FLOAT</td>
<td></td>
</tr>
<tr>
<td>+LayerCloudTopTemperature: H5T_NATIVE_USHORT</td>
<td></td>
</tr>
<tr>
<td>+QF1_VIIRSCTTLAYEREDR: H5T_NATIVE_UCHAR</td>
<td></td>
</tr>
<tr>
<td>+QF2_VIIRSCTTLAYEREDR: H5T_NATIVE_UCHAR</td>
<td></td>
</tr>
<tr>
<td>+QF3_VIIRSCTTAVGEDR: H5T_NATIVE_UCHAR</td>
<td></td>
</tr>
<tr>
<td>+QF4_VIIRSCTTAVGEDR: H5T_NATIVE_UCHAR</td>
<td></td>
</tr>
<tr>
<td>+QF5_VIIRSCTTAVGEDR: H5T_NATIVE_UCHAR</td>
<td></td>
</tr>
<tr>
<td>+QF6_VIIRSCTTAVGEDR: H5T_NATIVE_UCHAR</td>
<td></td>
</tr>
</tbody>
</table>

Figure: 5.1.7.3-1 Cloud Top Temperature UML Diagram

5.1.7.4 Cloud Top Temperature HDF5 Metadata Details

The HDF5 metadata elements associated with the Cloud Top Temperature EDR are listed in 474-00448-02-01, the JPSS Algorithm Specification Vol. II: Data Dictionary for the Common Algorithms. The Cloud Top Temperature EDR metadata includes all of the common metadata at the root, product, aggregation, and granule levels.

In addition to the common metadata items for this product, Table 5.1.7.4-1, Cloud Top Temperature Quality Summary Metadata Values, provides the following items as name/value pairs. The listed name/value pair items in the table are the granule level quality flags for the Cloud Top Temperature EDR.

<table>
<thead>
<tr>
<th>N_Quality_Summary</th>
<th>Value</th>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusion/Degradation Summary</td>
<td>0 - 100</td>
<td>Percent of cloudy pixels with one or more exclusion or degradation criteria flags</td>
<td></td>
</tr>
<tr>
<td>Percent Converged Pixels</td>
<td>0 - 100</td>
<td>A ratio (expressed as a percent) of the number of converged vs. that of cloudy pixels for the entire granule.</td>
<td></td>
</tr>
</tbody>
</table>

5.1.7.5 Cloud Top Temperature Geolocation Details

See Section 4.8, VIIRS Cloud Aggregated Geolocation.

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
6 Cloud Physical Properties Ancillary and Auxiliary Data Inputs

Not Applicable
7 Look-up Tables and Processing Coefficient Tables

The template used for these formats in this document is described below.

**Data Mnemonic:** This is a unique identifier. JPSS CDFCB-X Vol. I, 474-00001-01 describes the data mnemonic definition methodology.

**Description/Purpose:** A brief description of the data format and its purpose.

**Instrument:** Identification of the Instrument associated with the table.

**File-Naming Construct:** A description of the file-naming constructs for those data units that apply. JPSS CDFCB-X Vol. I, 474-00001-01 defines file-naming conventions.

**File Size:** The size of the data file.

**File Format Type:** The format type of the data file.

**Production Frequency:** Production frequency is the interval of time for data generation. A production frequency equal to dynamic implies that it is only as requested or as needed.

**Data Format/Structure:** This defines the actual data format. The definitions provide information for every data element in the data unit.

The following rules apply to all tables:

1. All field names mandatory, unless specified otherwise.
2. Fill data is specified, where applicable.
3. Strings are left-aligned and integers are right-aligned, unless specified otherwise.
4. For information regarding Coordinated Universal Time (UTC) and IDPS Epoch Time (IET) conventions, see the JPSS CDFCB-X Vol. I, 474-00001-01.
5. For all references of the ASCII Standard, the corresponding International Standards Organization (ISO) standard is ISO/IEC 10646. The specific Unicode is UTF8, unless stated otherwise.
6. The fields are presented in order (either top - down or most significant first), unless stated otherwise.

7.1 Look-Up Tables

Algorithm Look-up Table (LUT) files contain tables of pre-computed values used in lieu of real-time algorithm computations to reduce processing resource demands. Table values are typically the result of RTM executions and other environmental model simulations. These data generally cover broad, multi-dimensional parameter spaces which are unique to each algorithm.

7.1.1 VIIRS CTP COT LUT

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>NP_NU-LM0040-004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description/Purpose</td>
<td>The VIIRS Cloud Top Parameters (CTP) COT LUT file contains factors for the conversion of COT at 0.55 microns to 10.763 microns. This file is used in the VIIRS CTP algorithm.</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
File-Naming Construct
See the File-Naming Convention for Auxiliary Data Formats, JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4. The Collection Short Name used in the filename is based on the table - see the JPSS CDFCB-X Vol. I, 474-00001-01, for the applicable Collection Short Names. Version Number Field provides Provenance Version Identifier.

File Size
See Table:  7.1.1-1  VIIRS CTP COT LUT Data Format for size.

File Format Type
Little Endian Binary

Production Frequency
As needed

Data Content and Data Format
For details see Table 7.1.1-1, VIIRS CTP COT LUT Data Format.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Length (Bytes)</th>
<th>Data Type</th>
<th>Range of Values</th>
<th>Units</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>data</td>
<td>31208</td>
<td>32-bit float point</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>2 Dimensional Array: COT_ROWS x COT_COLS Size of Dimension(s): 3901 x 2</td>
</tr>
</tbody>
</table>

File Size 31,208 Bytes

7.1.2 VIIRS CTP MSC LUT

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>Description/ Purpose</th>
<th>File-Naming Construct</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP NU-LM0040-005</td>
<td>The VIIRS CTP Multiple Scattering Correction (MSC) file contains regression coefficients for multiple scattering corrections. This file is used by the VIIRS CTP algorithm.</td>
<td>See the File-Naming Convention for Auxiliary Data Formats, JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4. The Collection Short Name used in the filename is based on the table - see the JPSS CDFCB-X Vol. I, 474-00001-01, for the applicable Collection Short Names. Version Number Field provides Provenance Version Identifier.</td>
</tr>
</tbody>
</table>

File Size
See Table:  7.1.2-1  VIIRS CTP MSC LUT Data Format for size.

File Format Type
Little Endian Binary

Production Frequency
As needed

Data Content and Data Format
For details see Table 7.1.2-1, VIIRS CTP MSC LUT Data Format.

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### Table: 7.1.2-1  VIIRS CTP MSC LUT Data Format

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Length (Bytes)</th>
<th>Data Type</th>
<th>Range of Values</th>
<th>Units</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>grid_ndims</td>
<td>4</td>
<td>32-bit integer</td>
<td>3</td>
<td>unitless</td>
<td>Number of input dimensions. That is, the data vectors are specified on a grid in 'grid_ndims'-dimensional space</td>
</tr>
<tr>
<td>data_ndims</td>
<td>4</td>
<td>32-bit integer</td>
<td>4</td>
<td>unitless</td>
<td>Dimension of data values. Data variables are vectors with 'data_ndims' elements</td>
</tr>
<tr>
<td>ntics</td>
<td>12</td>
<td>32-bit integer</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>Number of 'tic marks' for each dimension. 'tic marks' are essentially the grid coordinates. The value in ntics[i] is the number of grid coordinates for dimension number 'i'</td>
</tr>
<tr>
<td>factor</td>
<td>12</td>
<td>32-bit integer</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>Factors for indexing values</td>
</tr>
<tr>
<td>tic_min</td>
<td>12</td>
<td>32-bit floating point</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>Min tic value used for interpolation</td>
</tr>
<tr>
<td>tic_max</td>
<td>12</td>
<td>32-bit floating point</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>Max tic value used for interpolation</td>
</tr>
<tr>
<td>tic</td>
<td>132</td>
<td>32-bit floating point</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>Tic mark (grid coordinate) table. The value in tic[i][j] is the 'j'th grid coordinate for dimension 'i'</td>
</tr>
<tr>
<td>data</td>
<td>4224</td>
<td>32-bit floating point</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>Regression coefficients for multiple scattering correction</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Length (Bytes)</th>
<th>Data Type</th>
<th>Range of Values</th>
<th>Units</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>File Size</td>
<td>4,412 Bytes</td>
<td></td>
<td></td>
<td></td>
<td>Size of Dimension(s): 4 x 264</td>
</tr>
</tbody>
</table>
### 7.1.3 VIIRS CTP OSS OD LUT

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>NP_NU-LM0040-006</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description/Purpose</strong></td>
<td>The VIIRS CTP OSS OD LUT file contains the OSS forward model input parameters. This file is used in the VIIRS Cloud Top Pressure (CTP) algorithm.</td>
</tr>
<tr>
<td><strong>File-Naming Construct</strong></td>
<td>See the File-Naming Convention for Auxiliary Data Formats, JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4. The Collection Short Name used in the filename is based on the table - see the JPSS CDFCB-X Vol. I, 474-00001-01, for the applicable Collection Short Names. Version Number Field provides Provenance Version Identifier.</td>
</tr>
<tr>
<td><strong>File Size</strong></td>
<td>See Table: 7.1.3-1 VIIRS CTP OSS OD LUT Data Format for size.</td>
</tr>
<tr>
<td><strong>File Format Type</strong></td>
<td>Little Endian Binary</td>
</tr>
<tr>
<td><strong>Production Frequency</strong></td>
<td>As needed</td>
</tr>
<tr>
<td><strong>Data Content and Data Format</strong></td>
<td>For details see Table 7.1.3-1, VIIRS CTP OSS OD LUT Data Format.</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
Table: 7.1.3-1 VIIRS CTP OSS OD LUT Data Format

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Length (Bytes)</th>
<th>Data Type</th>
<th>Range of Values</th>
<th>Units</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>NmolFix</td>
<td>2</td>
<td>16-bit integer</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td></td>
</tr>
<tr>
<td>Nmol</td>
<td>2</td>
<td>16-bit integer</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td></td>
</tr>
<tr>
<td>MolIDFix</td>
<td>24</td>
<td>16-bit integer</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>1 Dimensional Array: NUM_MOLIDFIX Size of Dimension(s): 12</td>
</tr>
<tr>
<td>MolID</td>
<td>2</td>
<td>16-bit integer</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>1 Dimensional Array: NUM_MOLID Size of Dimension(s): 1</td>
</tr>
<tr>
<td>Spare</td>
<td>2</td>
<td>16-bit integer</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td></td>
</tr>
<tr>
<td>NLayerOD</td>
<td>4</td>
<td>32-bit integer</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td></td>
</tr>
<tr>
<td>NTmpOD</td>
<td>4</td>
<td>32-bit integer</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td></td>
</tr>
<tr>
<td>pref</td>
<td>96</td>
<td>32-bit floating point</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>1 Dimensional Array: NUM_PREF Size of Dimension(s): 24</td>
</tr>
<tr>
<td>tmptab</td>
<td>920</td>
<td>32-bit floating point</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>2 Dimensional Array: TMPTAB_ROWS x TMPTAB_COLS Size of Dimension(s): 23 x 10</td>
</tr>
<tr>
<td>wvptab</td>
<td>276</td>
<td>32-bit floating point</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>2 Dimensional Array: WVPTAB_ROWS x WVPTAB_COLS Size of Dimension(s): 23 x 3</td>
</tr>
<tr>
<td>padFloat</td>
<td>4</td>
<td>32-bit floating point</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>Pad</td>
</tr>
<tr>
<td>vFreq</td>
<td>48</td>
<td>64-bit floating point</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>1 Dimensional Array: NUM_VFREQ Size of Dimension(s): 6</td>
</tr>
<tr>
<td>Field Name</td>
<td>Length (Bytes)</td>
<td>Data Type</td>
<td>Range of Values</td>
<td>Units</td>
<td>Comments</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------</td>
<td>--------------------</td>
<td>-----------------------</td>
<td>--------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>NmolS_tmp</td>
<td>2</td>
<td>16-bit integer</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td></td>
</tr>
<tr>
<td>ImolS_tmp</td>
<td>2</td>
<td>16-bit integer</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td></td>
</tr>
<tr>
<td>Padshort</td>
<td>4</td>
<td>16-bit integer</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>1 Dimensional Array: NUM_IMOLS Size of Dimension(s): 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 Dimensional Array: Size of Dimension(s): 2</td>
</tr>
<tr>
<td>kfix</td>
<td>5520</td>
<td>32-bit floating</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>2 Dimensional Array: KFIX_ROWS x KFIX_COLS Size of Dimension(s): 6 x 230</td>
</tr>
<tr>
<td>dkh2o</td>
<td>5520</td>
<td>32-bit floating</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>2 Dimensional Array: DKH2O_ROWS x DKH2O_COLS</td>
</tr>
<tr>
<td>kh2o</td>
<td>5520</td>
<td>32-bit floating</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td>2 Dimensional Array: KH2O_ROWS x KH2O_COLS Size of Dimension(s): 6 x 230</td>
</tr>
<tr>
<td><strong>FileSize</strong></td>
<td><strong>17,952 Bytes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
7.1.4 VIIRS CTP OSS SEL LUT

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>NP NU-LM0040-007</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>File-Naming Construct</strong></td>
<td>The VIIRS OSS SEL LUT file contains the OSS SEL regression coefficients. This file is used in the VIIRS CTP algorithm.</td>
</tr>
<tr>
<td><strong>File-Naming Construct</strong></td>
<td>See the File-Naming Convention for Auxiliary Data Formats, JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4. The Collection Short Name used in the filename is based on the table - see the JPSS CDFCB-X Vol. I, 474-00001-01, for the applicable Collection Short Names. Version Number Field provides Provenance Version Identifier.</td>
</tr>
<tr>
<td><strong>File Size</strong></td>
<td>See Table: 7.1.4-1 VIIRS CTP OSS SEL LUT Data Format for size.</td>
</tr>
<tr>
<td><strong>File Format Type</strong></td>
<td>Little Endian Binary</td>
</tr>
<tr>
<td><strong>Production Frequency</strong></td>
<td>As needed</td>
</tr>
<tr>
<td><strong>Data Content and Data Format</strong></td>
<td>For details see Table 7.1.4-1, VIIRS CTP OSS SEL LUT Data Format.</td>
</tr>
</tbody>
</table>
### Table: 7.1.4-1  VIIRS CTP OSS SEL LUT Data Format

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Length (Bytes)</th>
<th>Data Type</th>
<th>Range of Values</th>
<th>Units</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>nchan</td>
<td>4</td>
<td>32-bit integer</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td></td>
</tr>
<tr>
<td>nf_sel</td>
<td>4</td>
<td>32-bit integer</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td></td>
</tr>
<tr>
<td>nchmax</td>
<td>4</td>
<td>32-bit integer</td>
<td>MIN_VAL - MAX_VAL</td>
<td>unitless</td>
<td></td>
</tr>
</tbody>
</table>
| cFreq      | 4              | 32-bit floating point | MIN_VAL - MAX_VAL     | unitless  | 1 Dimensional Array: NUM_CFREQ  
Size of Dimension(s): 1                                                   |
| nch        | 12             | 16-bit integer    | MIN_VAL - MAX_VAL     | unitless  | 1 Dimensional Array: NUM_NCH  
Size of Dimension(s): 6                                                   |
| coef       | 24             | 32-bit floating point | MIN_VAL - MAX_VAL     | unitless  | 1 Dimensional Array: COEF_ROWS x COEF_COLS  
Size of Dimension(s): 6 x 1                                               |
| ichmap     | 24             | 32-bit integer    | MIN_VAL - MAX_VAL     | unitless  | 1 Dimensional Array: ICH_ROWS x ICH_COLS  
Size of Dimension(s): 6 x 1                                               |

**File Size**  76 Bytes

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
7.2 Processing Coefficient Tables

The S-NPP/JPSS-1 ground system data product generation subsystem uses Processing Coefficient Table (PCT) file parameters. PCT files can be either Automated or Manual coefficient tables. Within the Manual table type are two coefficient classes: Initial and Ephemeral. Sections below describe all three and any tables of that type for the product.

7.2.1 Automated Processing Coefficients

Automated Processing Coefficient (PC) files contain parameters updated and/or created during the processing of the S-NPP/JPSS Data Products by the processing algorithms. The processing environment subsequently uses these files without human review of their contents. Files can be used immediately after creation or in future processing such as the next granule in the production data stream processing.

7.2.1.1 VIIRS Cloud Physical Property Automated PCs

VIIRS Cloud Physical Properties product generation currently uses no Automated PCs

7.2.2 Manual Processing Coefficients

Manual Processing Coefficient (PC) files contain parameters used for S-NPP/JPSS Data Product generation which require human review prior to operational processing environment insertion. Manual Processing Coefficients have two classes:

- Initialization PCTs contain infrequently updated initial parameters sets S-NPP/JPSS uses for data product generation.
- Ephemeral PCTs contain frequently updated parameters sets S-NPP/JPSS uses for data product generation.

7.2.2.1 VIIRS Cloud Physical Properties Initialization PCs

7.2.2.1.1 VIIRS CBH Liquid Water Content PC

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>NP_NU-LM0233-001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description/Purpose</td>
<td>The VIIRS Cloud Base Height (CBH) Liquid Water Content (LWC) PCT file contains the cloud Liquid Water Content values. This file contains a single fixed LWC value for each cloud type (cirrus, stratus, etc.). This file is used in the VIIRS CBH algorithm.</td>
</tr>
<tr>
<td>File-Naming Construct</td>
<td>See the File-Naming Convention for Auxiliary Data Formats, JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4. The Collection Short Name used in the filename is based on the table - see the JPSS CDFCB-X Vol. I, 474-00001-01, for the applicable Collection Short Names.</td>
</tr>
<tr>
<td>File Size</td>
<td>See Table: 7.2.2.1.1-1 VIIRS CBH LWC PC Data Format for size.</td>
</tr>
<tr>
<td>File Format Type</td>
<td>Little Endian Binary</td>
</tr>
<tr>
<td>Production Frequency</td>
<td>As needed</td>
</tr>
<tr>
<td>Data Content and Data Format</td>
<td>For details see Table 7.2.2.1.1-1 VIIRS CBH LWC PC Data Format</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### Table: 7.2.2.1.1-1 VIIRS CBH LWC PC Data Format

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Length (Bytes)</th>
<th>Data Type</th>
<th>Range of Values</th>
<th>Units</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>lwc</td>
<td>48</td>
<td>64-bit floating point</td>
<td>0.000: no cloud 0.293: stratus 0.455: altocumulus - altostratus 0.580: cumulus 0.010: cirrus 0.010: cirrocumulus</td>
<td>g/m³</td>
<td>1 Dimensional Array: cloudType Size of Dimension(s): 6</td>
</tr>
</tbody>
</table>

File Size: 48 Bytes

### 7.2.2.1.2 VIIRS CCL Cloud Type PC

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>NP_NU-LM0233-002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description/Purpose</td>
<td>The VIIRS CCL Cloud Type PCT file contains the attribute values of cloud types. These values are derived from standard meteorological definitions. This file is used in the VIIRS Cloud Cover/Layers (CCL) algorithm.</td>
</tr>
</tbody>
</table>

| File-Naming Construct | See the File-Naming Convention for Auxiliary Data Formats, JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4. The Collection Short Name used in the filename is based on the table - see the JPSS CDFCB-X Vol. I, 474-00001-01, for the applicable Collection Short Names. |

| File Size | See Table: 7.2.2.1.2-1 VIIRS CCL Cloud Type PC Data Format for size. |
| File Format Type | Little Endian Binary |
| Production Frequency | As needed |
| Data Content and Data Format | For details see Table 7.2.2.1.2-1, VIIRS CCL Cloud Type PC Data Format |

### Table: 7.2.2.1.2-1 VIIRS CCL Cloud Type PC Data Format

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Length (Bytes)</th>
<th>Data Type</th>
<th>Range of Values</th>
<th>Units</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>height</td>
<td>20</td>
<td>32-bit floating point</td>
<td>stratus = 1.3 altocumulus = 3.5 cumulus = 3.3 cirrus = 9.0 cirrocumulus = 10.5</td>
<td>Kilometers</td>
<td>Mean Cloud Top Height 1 Dimensional Array: height Size of Dimension(s): 5</td>
</tr>
<tr>
<td>size</td>
<td>20</td>
<td>32-bit floating point</td>
<td>stratus = 13.5 altocumulus = 17.0 cumulus = 27.5 cirrus = 55.0 cirrocumulus = 75.0</td>
<td>Micrometers</td>
<td>Mean Cloud Effective Particle Size 1 Dimensional Array: size</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

### Field Name

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Length (Bytes)</th>
<th>Data Type</th>
<th>Range of Values</th>
<th>Units</th>
<th>Comments</th>
</tr>
</thead>
</table>
| op_thick   | 20             | 32-bit floating point | stratus = 5.5  
|            |                |           | altocumulus = 17.0  
|            |                |           | cumulus = 26.5  
|            |                |           | cirrus = 2.5  
|            |                |           | cirrocumulus = 4.5  | unitless | Mean Cloud Optical Thickness  
|            |                |           |                  |        | 1 Dimensional Array:  
|            |                |           |                  |        | op_thick  
|            |                |           |                  |        | Size of Dimension(s):  
|            |                |           |                  |        | 5  

### File Size

- 60 Bytes

### 7.2.2.1.3 VIIRS CCL/GCE Cloud Aggregation PC

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>NP_NU-LM0233-005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description/Purpose</td>
<td>The VIIRS CCL/GCE Cloud Aggregation PCT file contains the data that identifies the cell sizes appropriate for the CCL data products (both the clustering cells and the aggregation cells). This file is used in the VIIRS CCL and GCE algorithms.</td>
</tr>
<tr>
<td>File-Naming Construct</td>
<td>See the File-Naming Convention for Auxiliary Data Formats, JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4. The Collection Short Name used in the filename is based on the table - see the JPSS CDFCB-X Vol. I, 474-00001-01, for the applicable Collection Short Names.</td>
</tr>
<tr>
<td>File Size</td>
<td>See Table: 7.2.2.1.3-1 VIIRS CCL/GCE Cloud Aggregation PC Data Format for size.</td>
</tr>
<tr>
<td>File Format Type</td>
<td>Little Endian Binary</td>
</tr>
<tr>
<td>Production Frequency</td>
<td>As needed</td>
</tr>
<tr>
<td>Data Content and Data Format</td>
<td>For details see Table 7.2.2.1.3-1, VIIRS CCL/GCE Cloud Aggregation PC Data Format</td>
</tr>
</tbody>
</table>
Table: 7.2.2.1.3-1  VIIRS CCL/GCE Cloud Aggregation PC Data Format

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Length (Bytes)</th>
<th>Data Type</th>
<th>Range of Values</th>
<th>Units</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>numAtCellsPerScan</td>
<td>4</td>
<td>32-bit integer</td>
<td>0-MAX_VAL</td>
<td>unitless</td>
<td>Number of along-track (rows) horizontal cells per scan</td>
</tr>
<tr>
<td>numXtCellsPerScan</td>
<td>4</td>
<td>32-bit integer</td>
<td>0-MAX_VAL</td>
<td>unitless</td>
<td>Number of cross-track (columns) horizontal cells per</td>
</tr>
<tr>
<td>numAtPixPerScan</td>
<td>4</td>
<td>32-bit integer</td>
<td>0-MAX_VAL</td>
<td>unitless</td>
<td>Number of along-track (rows) pixels per scan</td>
</tr>
<tr>
<td>numXtPixPerScan</td>
<td>4</td>
<td>32-bit integer</td>
<td>0-MAX_VAL</td>
<td>unitless</td>
<td>Number of cross-track (columns) pixels per scan</td>
</tr>
<tr>
<td>crow</td>
<td>575520</td>
<td>32-bit integer</td>
<td>0-MAX_VAL</td>
<td>unitless</td>
<td>Cell row index</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 Dimensional Array: VIIRS_AGGTBL_ENTRIES</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Size of Dimension(s): 143.880</td>
</tr>
<tr>
<td>ccol</td>
<td>575520</td>
<td>32-bit integer</td>
<td>0-MAX_VAL</td>
<td>unitless</td>
<td>Cell column index</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 Dimensional Array: VIIRS_AGGTBL_ENTRIES</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Size of Dimension(s): 143.880</td>
</tr>
<tr>
<td>scan</td>
<td>575520</td>
<td>32-bit integer</td>
<td>0-MAX_VAL</td>
<td>unitless</td>
<td>Scan index</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 Dimensional Array: VIIRS_AGGTBL_ENTRIES</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Size of Dimension(s): 143.880</td>
</tr>
<tr>
<td>row</td>
<td>575520</td>
<td>32-bit integer</td>
<td>0-MAX_VAL</td>
<td>unitless</td>
<td>Pixel row index</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 Dimensional Array: VIIRS_AGGTBL_ENTRIES</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Size of Dimension(s): 143.880</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Length (Bytes)</th>
<th>Data Type</th>
<th>Range of Values</th>
<th>Units</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>col</td>
<td>155056</td>
<td>32-bit integer</td>
<td>0-MAX_VAL</td>
<td>unitless</td>
<td>Pixel column index</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 Dimensional Array: VIIRS_AGGTBL_ENTRIES</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Size of Dimension(s): 38,764</td>
</tr>
<tr>
<td>type</td>
<td>575520</td>
<td>32-bit integer</td>
<td>1 = CLUSTER_CELL</td>
<td>unitless</td>
<td>Cell type</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 = PRODUCT_CELL</td>
<td></td>
<td>1 Dimensional Array: VIIRS_AGGTBL_ENTRIES</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 = PRODUCT_AND_CLUSTER_CELL</td>
<td></td>
<td>Size of Dimension(s): 143,880</td>
</tr>
<tr>
<td>File Size</td>
<td>3,453,136 Bytes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7.2.2.2 VIIRS Cloud Physical Properties Ephemeral PCTs

7.2.2.2.1 VIIRS CBH Ephemeral PC

<table>
<thead>
<tr>
<th>Description/ Purpose</th>
<th>The VIIRS Cloud Base Height (CBH) Ephemeral PC provides tunable processing coefficients for use by the algorithm during execution. The coefficients can be modified (tuned) through a configuration control process in response to algorithm, performance, inputs, sensitivity, etc. changes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>File-Naming Construct</td>
<td>See the File-Naming Convention for Auxiliary Data Formats, JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4. The Collection Short Name used in the filename is based on the table - see the JPSS CDFCB-X Vol. I, 474-00001-01, Table B-1 for the applicable Collection Short Names.</td>
</tr>
<tr>
<td>File Size</td>
<td>See Table: 7.2.2.2.1-1 VIIRS CBH Ephemeral PC</td>
</tr>
<tr>
<td>File Format Type</td>
<td>Little Endian Binary</td>
</tr>
<tr>
<td>Production Frequency</td>
<td>As needed</td>
</tr>
<tr>
<td>Data Content and Data Format</td>
<td>For details see Table 7.2.2.2.1-1, VIIRS CBH Ephemeral PC Data Format</td>
</tr>
<tr>
<td>Field Name</td>
<td>Length (Bytes)</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------</td>
</tr>
<tr>
<td>minCbh</td>
<td>4</td>
</tr>
<tr>
<td>maxCbh</td>
<td>4</td>
</tr>
<tr>
<td>c0</td>
<td>4</td>
</tr>
<tr>
<td>c1</td>
<td>4</td>
</tr>
<tr>
<td>c2</td>
<td>4</td>
</tr>
<tr>
<td>c3</td>
<td>4</td>
</tr>
<tr>
<td>c4</td>
<td>4</td>
</tr>
<tr>
<td>c5</td>
<td>4</td>
</tr>
<tr>
<td>c6</td>
<td>4</td>
</tr>
<tr>
<td>c7</td>
<td>4</td>
</tr>
<tr>
<td>d0</td>
<td>4</td>
</tr>
<tr>
<td>d3</td>
<td>4</td>
</tr>
<tr>
<td>minCtt</td>
<td>4</td>
</tr>
<tr>
<td>maxCtt</td>
<td>4</td>
</tr>
<tr>
<td>File Size</td>
<td>56 Bytes</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
7.2.2.2.2 **VIIRS CCL Ephemeral PC**

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>DP_NU-LM2020-013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description/Purpose</strong></td>
<td>The VIIRS Cloud Cover/Layer (CCL) Ephemeral PC provides tunable processing coefficients for use by the algorithm during execution. The coefficients can be modified (tuned) through a configuration control process in response to algorithm, performance, inputs, sensitivity, etc. changes.</td>
</tr>
<tr>
<td><strong>File-Naming Construct</strong></td>
<td>See the File-Naming Convention for Auxiliary Data Formats, JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4. The Collection Short Name used in the filename is based on the table - see the JPSS CDFCB-X Vol. I, 474-00001-01, Table B-1 for the applicable Collection Short Names.</td>
</tr>
<tr>
<td><strong>File Size</strong></td>
<td>See Table: 7.2.2.2.2-1 VIIRS CCL Ephemeral PC for size</td>
</tr>
<tr>
<td><strong>File Format Type</strong></td>
<td>Little Endian Binary</td>
</tr>
<tr>
<td><strong>Production Frequency</strong></td>
<td>As needed</td>
</tr>
<tr>
<td><strong>Data Content and Data Format</strong></td>
<td>For details see Table 7.2.2.2.2-1, VIIRS CCL Ephemeral PC Data Format</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontend_dsp.cfm to verify that this is the correct version prior to use.
Table: 7.2.2.2.2-1 VIIRS CCL Ephemeral PC

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Length (Bytes)</th>
<th>Data Type</th>
<th>Range of Values</th>
<th>Units</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>wgtCth</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 0.5</td>
<td>km</td>
<td>K-Means algorithm cluster assignment weight for cloud top height</td>
</tr>
<tr>
<td>wgtCot</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 0.0</td>
<td>Unitless</td>
<td>K-Means algorithm cluster assignment weight for cloud optical thickness</td>
</tr>
<tr>
<td>wgtEps</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 0.2</td>
<td>Micrometers</td>
<td>K-Means algorithm cluster assignment weight for cloud top height</td>
</tr>
<tr>
<td>wgtPhase</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 2.0</td>
<td>Unitless</td>
<td>K-Means algorithm cluster assignment weight for cloud top height</td>
</tr>
<tr>
<td>EkmCthThresh1</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 0.75</td>
<td>Unitless</td>
<td>Ekm_first_guess() threshold on CTH for not splitting layers</td>
</tr>
<tr>
<td>EkmCthThresh2</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 1.6</td>
<td>Unitless</td>
<td>Ekm_first_guess() threshold on CTH for not splitting layers</td>
</tr>
<tr>
<td>EkmCthThresh3</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 1.6</td>
<td>Unitless</td>
<td>Ekm_first_guess() threshold on CTH for not splitting layers</td>
</tr>
<tr>
<td>Cluster_Flag_Threshold</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 0.75</td>
<td>percent</td>
<td>Percentage of cloudy product pixels</td>
</tr>
<tr>
<td>CTH_LOW_THRESH</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 2.5</td>
<td>Unitless</td>
<td>Mbkm_first_guess() lower CTH threshold</td>
</tr>
<tr>
<td>CTH_MID_THRESH</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 5.0</td>
<td>Unitless</td>
<td>Mbkm_first_guess() middle CTH threshold</td>
</tr>
<tr>
<td>CTH_HIGH_THRESH</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 7.5</td>
<td>Unitless</td>
<td>Mbkm_first_guess() high CTH threshold</td>
</tr>
<tr>
<td>PHASE_WATER</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 0.0</td>
<td>Unitless</td>
<td>Water cloud</td>
</tr>
<tr>
<td>PHASE_MIXED</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 0.5</td>
<td>Unitless</td>
<td>Water and ice cloud</td>
</tr>
<tr>
<td>PHASE_ICE</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 1.0</td>
<td>Unitless</td>
<td>Ice cloud</td>
</tr>
<tr>
<td>gracefulDegradationMode</td>
<td>1</td>
<td>unsigned 8-bit char</td>
<td>Initially set to 0</td>
<td>Unitless</td>
<td>Switch for handling missing pixel data</td>
</tr>
<tr>
<td>kmeansAlgorithm</td>
<td>1</td>
<td>unsigned 8-bit char</td>
<td>Initially set to 0</td>
<td>Unitless</td>
<td>Switch to select the first guess algorithm for layer analysis</td>
</tr>
<tr>
<td>kmeansMaxIter</td>
<td>1</td>
<td>unsigned 8-bit char</td>
<td>Initially set to 3</td>
<td>Unitless</td>
<td>Maximum number of iterations</td>
</tr>
<tr>
<td>clusterConvergCrit</td>
<td>1</td>
<td>unsigned 8-bit char</td>
<td>Initially set to 14</td>
<td>Unitless</td>
<td>Convergence criteria = number of pixel reassignments</td>
</tr>
</tbody>
</table>

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Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Length (Bytes)</th>
<th>Data Type</th>
<th>Range of Values</th>
<th>Units</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>File Size</td>
<td>60 Bytes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 7.2.2.2.3 VIIRS Cloud Top Parameters (CTP) Ephemeral PC

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>DP_NU-LM2020-016</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description/ Purpose</strong></td>
<td>The VIIRS Cloud Top Parameters (CTP) Ephemeral PC provides tunable processing coefficients for use by the algorithm during execution. The coefficients can be modified (tuned) through a configuration control process in response to algorithm, performance, inputs, sensitivity, etc. changes.</td>
</tr>
<tr>
<td><strong>File-Naming Construct</strong></td>
<td>See the File-Naming Convention for Auxiliary Data Formats, JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4. The Collection Short Name used in the filename is based on the table - see the JPSS CDFCB-X Vol. I, 474-00001-01, Table B-1 for the applicable Collection Short Names.</td>
</tr>
<tr>
<td><strong>File Size</strong></td>
<td>See Table: 7.2.2.2.3-1 VIIRS CTP Ephemeral PC for size.</td>
</tr>
<tr>
<td><strong>File Format Type</strong></td>
<td>Little Endian Binary</td>
</tr>
<tr>
<td><strong>Production Frequency</strong></td>
<td>As needed</td>
</tr>
<tr>
<td><strong>Data Content and Data Format</strong></td>
<td>For details see Table 7.2.2.2.3-1, VIIRS CTP Ephemeral PC Data Format</td>
</tr>
</tbody>
</table>

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**Table: 7.2.2.2.3-1 VIIRS CTP Ephemeral PC**

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Length (Bytes)</th>
<th>Data Type</th>
<th>Values (Initial)</th>
<th>Units</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>dayThresh</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 1.39626</td>
<td>radians</td>
<td>Day/Night solar zenith angle threshold</td>
</tr>
<tr>
<td>pw0</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 0.067</td>
<td>unitless</td>
<td>Precipitable Water regression coefficient</td>
</tr>
<tr>
<td>pw1</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to -0.002</td>
<td>unitless</td>
<td>Precipitable Water regression coefficient</td>
</tr>
<tr>
<td>pw2</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 0.22</td>
<td>unitless</td>
<td>Precipitable Water regression coefficient</td>
</tr>
<tr>
<td>pw3</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 0.105</td>
<td>unitless</td>
<td>Precipitable Water regression coefficient</td>
</tr>
<tr>
<td>maxCth</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 20</td>
<td>Kilometers</td>
<td>Maximum height for CTH</td>
</tr>
<tr>
<td>minCth</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 0</td>
<td>Kilometers</td>
<td>Minimum height for CTH</td>
</tr>
<tr>
<td>maxCtp</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 1050</td>
<td>hPa</td>
<td>Maximum pressure for CTP</td>
</tr>
<tr>
<td>minCtp</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 50</td>
<td>hPa</td>
<td>Minimum pressure for CTP</td>
</tr>
<tr>
<td>maxCtt</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 310</td>
<td>Kelvin</td>
<td>Maximum temperature for CTT</td>
</tr>
<tr>
<td>minCtt</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 180</td>
<td>Kelvin</td>
<td>Minimum temperature for CTT</td>
</tr>
<tr>
<td>padding</td>
<td>4</td>
<td>Unsigned 8-char</td>
<td>Set to 0</td>
<td>unitless</td>
<td>1 Dimensional Array: Size of Dimension(s): 4</td>
</tr>
<tr>
<td>numAggAt</td>
<td>8</td>
<td>64-bit integer</td>
<td>Initially set to 8</td>
<td>unitless</td>
<td>Number of pixels along track in analysis block</td>
</tr>
<tr>
<td>numAggXt</td>
<td>8</td>
<td>64-bit integer</td>
<td>Initially set to 8</td>
<td>unitless</td>
<td>Number of pixels along scan in analysis block</td>
</tr>
<tr>
<td>maxIterRt</td>
<td>8</td>
<td>64-bit integer</td>
<td>Initially set to 10</td>
<td>unitless</td>
<td>Maximum number of allowed iteration of daywater CTP retrieval</td>
</tr>
<tr>
<td>chiSqFit</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 1</td>
<td>unitless</td>
<td>Chi-square requirement for convergence</td>
</tr>
<tr>
<td>blkCloudCot</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 200</td>
<td>unitless</td>
<td>Default COT for black clouds in WindowIR retrieval</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
<table>
<thead>
<tr>
<th>Field Name</th>
<th>Length (Bytes)</th>
<th>Data Type</th>
<th>Values (Initial)</th>
<th>Units</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>blkCloudEps</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 10</td>
<td>unitless</td>
<td>Default EPS for black clouds in WindowIR retrieval</td>
</tr>
<tr>
<td>thkCot1</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 1</td>
<td>unitless</td>
<td>COT threshold for cloud thickness table</td>
</tr>
<tr>
<td>thkCot2</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 3</td>
<td>unitless</td>
<td>COT threshold for cloud thickness table</td>
</tr>
<tr>
<td>thkCtp1</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 600</td>
<td>hPa</td>
<td>CTP threshold for cloud thickness table</td>
</tr>
<tr>
<td>thkCtp2</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 800</td>
<td>hPa</td>
<td>CTP threshold for cloud thickness table</td>
</tr>
<tr>
<td>cldThick</td>
<td>36</td>
<td>32-bit floating point</td>
<td>Initially set to [0][0] = 200</td>
<td>unitless</td>
<td>Cloud thickness as a function of COT and CTP as specified by thkCot1, thkCot2, thkCtp1, and thkCtp2 2 Dimensional Array: Size of Dimension(s): 3 x 3</td>
</tr>
<tr>
<td>maxVertTemp</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 325</td>
<td>Kelvin</td>
<td>Maximum vertical temperature</td>
</tr>
<tr>
<td>minVertTemp</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 180</td>
<td>Kelvin</td>
<td>Minimum vertical temperature</td>
</tr>
<tr>
<td>maxVertWaterVap</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 10</td>
<td>g/kg</td>
<td>Maximum vertical water vapor</td>
</tr>
<tr>
<td>minVertWaterVap</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 9.9999997e-10</td>
<td>g/kg</td>
<td>Minimum vertical water vapor</td>
</tr>
<tr>
<td>minTempProf</td>
<td>4</td>
<td>32-bit floating point</td>
<td>Initially set to 100</td>
<td>Kelvin</td>
<td>Minimum valid temperature profile value</td>
</tr>
<tr>
<td>padding1</td>
<td>4</td>
<td>Unsigned 8-bit integer</td>
<td>Set to 0</td>
<td>unitless</td>
<td>Size of Dimension(s): 4</td>
</tr>
</tbody>
</table>

File Size: 160 Bytes

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
### 7.2.2.2.4 Generate Cloud EDR (GCE) Ephemeral PC

<table>
<thead>
<tr>
<th>Data Mnemonic</th>
<th>DP_NU-LM2020-017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description/Purpose</strong></td>
<td>The VIIRS Generate Cloud EDR (GCE) Ephemeral PC provides tunable processing coefficients for use by the algorithm during execution. The coefficients can be modified (tuned) through a configuration control process in response to algorithm, performance, inputs, sensitivity, etc. changes.</td>
</tr>
<tr>
<td><strong>File-Naming Construct</strong></td>
<td>See the File-Naming Convention for Auxiliary Data Formats, JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4. The Collection Short Name used in the filename is based on the table - see the JPSS CDFCB-X Vol. I, 474-00001-01, Table B-1 for the applicable Collection Short Names.</td>
</tr>
<tr>
<td><strong>File Size</strong></td>
<td>See Table: 7.2.2.2.4-1 VIIRS GCE Ephemeral PC for size.</td>
</tr>
<tr>
<td><strong>File Format Type</strong></td>
<td>Little Endian Binary</td>
</tr>
<tr>
<td><strong>Production Frequency</strong></td>
<td>As needed</td>
</tr>
<tr>
<td><strong>Data Content and Data Format</strong></td>
<td>For details see Table 7.2.2.2.4-1, VIIRS GCE Ephemeral PC Data Format</td>
</tr>
</tbody>
</table>

Check the JPSS MIS Server at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm to verify that this is the correct version prior to use.
Table: 7.2.2.4.1 VIIRS GCE Ephemeral PC

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Length (Bytes)</th>
<th>Data Type</th>
<th>Range of Values</th>
<th>Units</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>qf_cot_sza_threshold</td>
<td>4</td>
<td>32-bit floating point</td>
<td>0 - 1</td>
<td>Unitless</td>
<td>Cloud Optical Thickness solar zenith angle</td>
</tr>
<tr>
<td>c1</td>
<td>4</td>
<td>32-bit floating point</td>
<td>0 - 1</td>
<td>Unitless</td>
<td>Height_conversion constant</td>
</tr>
<tr>
<td>c2</td>
<td>4</td>
<td>32-bit floating point</td>
<td>0 - 1</td>
<td>Unitless</td>
<td>Height_conversion constant</td>
</tr>
<tr>
<td>c3</td>
<td>4</td>
<td>32-bit floating point</td>
<td>0 - 1</td>
<td>Unitless</td>
<td>Height_conversion constant</td>
</tr>
<tr>
<td><strong>File Size</strong></td>
<td><strong>16 Bytes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix A. Data Mnemonic to Interface Mapping

For a complete list of Data Mnemonic to Interface Mapping, see 474-00001-01, JPSS CDFCB-X Vol I. The CDFCB contains Data Mnemonics, Identifiers, Collection Short Names, Interface Documents, and Collection Long Names for each JPSS Data Product and for Geolocation data.
Appendix B. DQTT Quality Flag Mapping

The following table maps the quality flags by sensor and product that are reportable to the associated data product quality flag Test ID used in the processing environment.

<table>
<thead>
<tr>
<th>Algorithm</th>
<th>Product</th>
<th>Test ID</th>
<th>Quality Flag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud Products</td>
<td>VIIRS-CBH-EDR</td>
<td>4700</td>
<td>Granule level Quality Flag</td>
</tr>
<tr>
<td>Cloud Products</td>
<td>VIIRS-CBH-EDR</td>
<td>4701</td>
<td>Exclusion/Degradation Summary</td>
</tr>
<tr>
<td>Cloud Products</td>
<td>VIIRS-CCL-EDR</td>
<td>4800</td>
<td>Granule level Quality Flag</td>
</tr>
<tr>
<td>Cloud Products</td>
<td>VIIRS-CCL-EDR</td>
<td>4801</td>
<td>Exclusion/Degradation Summary</td>
</tr>
<tr>
<td>Cloud Products</td>
<td>VIIRS-CEPS-EDR</td>
<td>4900</td>
<td>Granule level Quality Flag</td>
</tr>
<tr>
<td>Cloud Products</td>
<td>VIIRS-CEPS-EDR</td>
<td>4901</td>
<td>Exclusion/Degradation Summary</td>
</tr>
<tr>
<td>Cloud Products</td>
<td>VIIRS-COT-EDR</td>
<td>5000</td>
<td>Granule level Quality Flag</td>
</tr>
<tr>
<td>Cloud Products</td>
<td>VIIRS-COT-EDR</td>
<td>5001</td>
<td>Exclusion/Degradation Summary</td>
</tr>
<tr>
<td>Cloud Products</td>
<td>VIIRS-CTH-EDR</td>
<td>5100</td>
<td>Granule level Quality Flag</td>
</tr>
<tr>
<td>Cloud Products</td>
<td>VIIRS-CTH-EDR</td>
<td>5101</td>
<td>Exclusion/Degradation Summary</td>
</tr>
<tr>
<td>Cloud Products</td>
<td>VIIRS-CTP-EDR</td>
<td>5200</td>
<td>Granule level Quality Flag</td>
</tr>
<tr>
<td>Cloud Products</td>
<td>VIIRS-CTP-EDR</td>
<td>5201</td>
<td>Exclusion/Degradation Summary</td>
</tr>
<tr>
<td>Cloud Products</td>
<td>VIIRS-CTT-EDR</td>
<td>5300</td>
<td>Granule level Quality Flag</td>
</tr>
<tr>
<td>Cloud Products</td>
<td>VIIRS-CTT-EDR</td>
<td>5301</td>
<td>Exclusion/Degradation Summary</td>
</tr>
</tbody>
</table>

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Appendix C. Abbreviations and Acronyms
See 470-00041 JPSS Program Lexicon for abbreviations and acronyms.
Attachment A.  XML Formats for Related Products

Table: ATT-1  XML Formats for Related Products

<table>
<thead>
<tr>
<th>File Number</th>
<th>XML Filename</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>474-00448-02-16_JPSS-CPP-DD-Part-16_0200E_VIIRS-CBH-EDR-PP.xml</td>
</tr>
<tr>
<td>2</td>
<td>474-00448-02-16_JPSS-CPP-DD-Part-16_0200E_VIIRS-CCL-EDR-PP.xml</td>
</tr>
<tr>
<td>3</td>
<td>474-00448-02-16_JPSS-CPP-DD-Part-16_0200E_VIIRS-CEPS-EDR-PP.xml</td>
</tr>
<tr>
<td>4</td>
<td>474-00448-02-16_JPSS-CPP-DD-Part-16_0200E_VIIRS-COT-EDR-PP.xml</td>
</tr>
<tr>
<td>5</td>
<td>474-00448-02-16_JPSS-CPP-DD-Part-16_0200E_VIIRS-CTH-EDR-PP.xml</td>
</tr>
<tr>
<td>6</td>
<td>474-00448-02-16_JPSS-CPP-DD-Part-16_0200E_VIIRS-CTP-IP-PP.xml</td>
</tr>
<tr>
<td>7</td>
<td>474-00448-02-16_JPSS-CPP-DD-Part-16_0200E_VIIRS-CTT-EDR-PP.xml</td>
</tr>
<tr>
<td>8</td>
<td>474-00448-02-16_JPSS-CPP-DD-Part-16_0200E_VIIRS-Cd-Cov-Type-IP-PP.xml</td>
</tr>
<tr>
<td>9</td>
<td>474-00448-02-16_JPSS-CPP-DD-Part-16_0200E_VIIRS-Cd-Layer-Type-IP-PP.xml</td>
</tr>
<tr>
<td>10</td>
<td>474-00448-02-16_JPSS-CPP-DD-Part-16_0200E_VIIRS-Cb-Ht-IP-PP.xml</td>
</tr>
<tr>
<td>11</td>
<td>474-00448-02-16_JPSS-CPP-DD-Part-16_0200E_VIIRS-Cd-Top-Parm-IP-PP.xml</td>
</tr>
<tr>
<td>12</td>
<td>474-00448-02-16_JPSS-CPP-DD-Part-16_0200E_VIIRS-Parx-Corr-CM-IP-PP.xml</td>
</tr>
<tr>
<td>13</td>
<td>474-00448-02-16_JPSS-CPP-DD-Part-16_0200E_VIIRS-Parx-Corr-Cd-Opt-Prop-IP-PP.xml</td>
</tr>
<tr>
<td>14</td>
<td>474-00448-02-16_JPSS-CPP-DD-Part-16_0200E_VIIRS-Parx-Corr-Cd-Top-Parm-IP-PP.xml</td>
</tr>
<tr>
<td>15</td>
<td>474-00448-02-16_JPSS-CPP-DD-Part-16_0200E_VIIRS-CLD-AGG-GEO-PP.xml</td>
</tr>
</tbody>
</table>

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