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Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirement Specification (SRS) for Ancillary Data Handling Gridding and Granulation

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NOAA / NASA

Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirement Specification (SRS) for Ancillary Data Handling Gridding and Granulation

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Preface

This document is under JPSS Ground Segment (GS) configuration control. Once this document is approved, JPSS approved changes are handled in accordance with Class I and Class II change control requirements as described in the JPSS Configuration Management Procedures, and changes to this document shall be made by complete revision.

Any questions should be addressed to:

JPSS Configuration Management Office
NASA/GSFC
Code 474
Greenbelt, MD 20771

Change History Log

Revision	Effective Date	Description of Changes (Reference the CCR & CCB/ERB Approve Date)
Rev-	Aug 29, 2013	This version incorporates 474-CCR-13-1214 which was approved by JPSS Ground ERB on the effective date shown.
A	Jan 30, 2014	This version incorporates 474-CCR-14-1721 and 474-CCR-14-1741 which was approved by JPSS Ground ERB on the effective date shown.
A1	Oct 23, 2014	This version incorporates 474-CCR-14-2091 which was approved by the JPSS Ground ERB for CO10 on the effective date shown.
B	Aug 14, 2014	This version incorporates 474-CCR-14-1781 and 474-CCR-14-1832 which was approved by JPSS Ground ERB on the effective date shown.
C	Feb 02, 2015	This version incorporates 474-CCR-14-2219, which was approved by JPSS Ground ERB on the effective date shown.
D	Apr 05, 2016	This version incorporates 474-CCR-14-2110, 474-CCR-15-2452, 474-CCR-15-2480, 474-CCR-15-2657, 474-CCR-15-2579 and 474-CCR-16-2827 which was approved by JPSS Ground ERB on the effective date shown.
E	Sep 22, 2016	This version incorporates 474-CCR-16-2939 and 474-CCR-16-3049 which was approved by JPSS Ground ERB on the effective date shown.
F	Oct 24, 2019	This version incorporates 474-CCR-19-4584 which was approved by the JPSS Ground ERB on Oct 17, 2019 and by the JPSS Ground Segment CCB on the effective date shown.
G	Sep 14, 2020	This version incorporates 474-CCR-19-4697 which was approved by the JPSS Ground ERB on Nov 26, 2019 and by the JPSS Ground Segment CCB on Dec 5, 2019; 474-CCR-19-4719 which was approved by the JPSS Ground ERB on Mar 11, 2020 and by the JPSS Ground Segment CCB on Mar 26, 2020; 474-CCR-20-5117 which was approved by the JPSS Ground ERB on Aug 12, 2020 and by the JPSS Ground Segment CCB on Aug 27, 2020; 474-CCR-20-5127 which was approved by the JPSS Ground ERB on Jul 24, 2020 and by the JPSS Ground Segment CCB on Jul 30, 2020; 474-CCR-20-4960 which was approved by the JPSS Ground ERB on Apr 22, 2020 and by the JPSS Ground Segment CCB on the effective date shown.
H	May 27, 2021	This version incorporates 474-CCR-21-5336 which was approved by the JPSS Ground ERB on May 04, 2021 and by the JPSS Ground Segment CCB on the effective date shown.
I	Aug 26, 2021	This version incorporates 474-CCR-21-5445 which was approved by the JPSS Ground ERB on May 07, 2021 and by the JPSS Ground Segment CCB on the effective date shown.

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1 INTRODUCTION

The Joint Polar Satellite System (JPSS) is the National Oceanic and Atmospheric Administration's (NOAA) next-generation operational Earth observation program that acquires and distributes global environmental data primarily from multiple polar-orbiting satellites. The program plays a critical role in NOAA's mission to understand and predict changes in weather, climate, oceans and coasts, and the space environment, which support the Nation's economy and protect lives and property. For information regarding the JPSS Program, missions, instruments, and partners, see the JPSS website at https://www.jpss.noaa.gov/.

1.1 Identification

This SRS provides requirements relating to support algorithms that process inputs from external data sources feeding many VIIRS Environmental Data Records (EDRs). Products generated in the process include gridded Intermediate Products (Grid IP), granulated IP, or granulated Ancillary data (ANC).

1.2 Algorithm Overview

There are 3 types of algorithms: gridding of granulated products, gridding of gridded products, and granulation of gridded products. Gridding is the process of accumulating, or compositing pixel data into earth-model grid cells. Granulation is the process of referencing ancillary data and previously gridded IPs to sensor data. External data sources are considered "ancillary" inputs.

1.3 Document Overview

Section	Description
Section 1	Introduction - Provides a brief overview of the JPSS Ground System and the relevant algorithm, as reference material only.
Section 2	Related Documentation - Lists related documents and identifies them as Parent, Applicable, or Information Documents such as, MOAs, MOUs, technical implementation agreements, as well as Data Format specifications. This section also establishes an order of precedence in the event of conflict between two or more documents.
Section 3	Algorithm Requirements - Provides a summary of the science requirements for the products covered by this volume.
Appendix A	Requirements Attributes - Provides the mapping of requirements to verification methodology and attributes.

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 documents are the Parent Documents 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.

Doc. No.	Document Title
474-01541	Joint Polar Satellite System (JPSS) Ground System Requirements Document (GSRD)
474-01543	Joint Polar Satellite System (JPSS) Ground –Segment Data Product Specification
474-00448-01-01	Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirements Specification (SRS) for the Common Algorithms

2.2   Applicable Documents

The following documents are the Applicable Documents from which this document has been derived. Any modification to an Applicable Document will be reviewed to identify the impact upon this document. In the event of conflict between an Applicable Document and the content of this document, the JPSS Program Configuration Change Board has the final authority for conflict resolution.

Doc. No.	Document Title
474-00448-02-07	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Ancillary Data Handling Gridding and Granulation
474-00448-04-07	Joint Polar Satellite System (JPSS) Algorithm Specification Volume IV: Software Requirements Software Parameter File (SRSPF)for the Ancillary Data Handling Gridding and Granulation

3 ALGORITHM REQUIREMENTS

3.1 Blocks and Modes

3.1.1 Normal Mode Performance

Not applicable.

3.1.2 Graceful Degradation Mode Performance

Not applicable.

3.2 Algorithm Functional Requirements

Not applicable.

3.2.1 Product Production Requirements

Not applicable.

3.2.2 Algorithm Science Requirements

Not applicable.

3.2.3 Algorithm Exception Handling

Not applicable.

3.3 External Interfaces

3.3.1 Inputs

SRS.01.07_962 The gridding and granulation software shall incorporate inputs as specified in Table 3-1.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 3.0.0

SRS.01.07_986 The Gran-To-Grid software shall ingest tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Ancillary Data Handling Gridding and Granulation (474-00448-02-07).

Rationale: This defines the formats for Lookup Tables, and Processing Coefficients for input into the algorithm module.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 3.0.0

SRS.01.07_993 The Grid-To-Grid software shall ingest tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Ancillary Data Handling Gridding and Granulation (474-00448-02-07).

Rationale: This defines the formats for Lookup Tables, and Processing Coefficients for input into the algorithm module.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 3.0.0

SRS.01.07_989 The Gran-To-Grid software shall ingest ancillary data formatted in accordance with Section 6 of the JPSS Algorithm Specification Vol II: Data Dictionary for Ancillary Data Handling Gridding and Granulation (474-00448-02-07).

Rationale: This defines the formats for Lookup Tables, and Processing Coefficients for input into the algorithm module.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 3.0.0

SRS.01.07_994 The Grid-To-Grid software shall ingest ancillary data formatted in accordance with Section 6 of the JPSS Algorithm Specification Vol II: Data Dictionary for Ancillary Data Handling Gridding and Granulation (474-00448-02-07).

Rationale: This defines the formats for Lookup Tables, and Processing Coefficients for input into the algorithm module.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 3.0.0

Table 3-1 lists the data interactions within the code governed by this SRS, as well as all downstream dependencies for outputs from this SRS.

Each row describes a single software interaction - data flowing from one software item to another. The data is listed in the first column. The second and third columns include the short name and mnemonic for the data. Blanks indicate there is no mnemonic. The fourth and fifth columns contain the SRS that generates the data product(s) in the first column, and the SRS that receives those products. The final two columns contain the actual function name in Algorithm Development Library (ADL) that produces those products, and the function that inputs those products. The SRS's titled "Ingest MSD" and "Store/Retrieve" are non-existent SRS's functioning as data handling for the IDPS. The software functions "Store Products" and "Retrieve Products" are similar non-existent functions that operate as IDPS data handling.

Table: 3-1   Systems Resource Flow Matrix: Ancillary Data Handling Gridding and Granulation

	Data Product Name	Collection Short Name	Mnemonic	Sending SRS	Receiving SRS	Sending Function	Receiving Function
2	•OMPS_TC_RGEO	•OMPS-TC-GEO	•None	Store/Retrieve (OMPS TC SDR)	Grid Gran	Retrieve Products	ProAncOmpsTcGranulateCloudTopPres
6	•OMPS_TC_RGEO	•OMPS-TC-GEO	•None	Store/Retrieve (OMPS TC SDR)	Grid Gran	Retrieve Products	ProAncOmpsTcGranulatePresLevelTemp
10	•OMPS_TC_RGEO	•OMPS-TC-GEO	•None	Store/Retrieve (OMPS TC SDR)	Grid Gran	Retrieve Products	ProAncOmpsTcGranulateSurfPres
12	•OMPS_TC_RGEO	•OMPS-TC-GEO	•None	Store/Retrieve (OMPS TC SDR)	Grid Gran	Retrieve Products	ProAncOmpsTcGranulateUVSurfReflect
13	•Terrain-Eco-ANC-Tile	•Terrain-Eco-ANC-Tile	•AN_NP-L10100-003	Anc and Aux Data	Grid Gran	Static Ancillary Data	ProAncViirsGranulateBathymetry
14	•Geolocation_Mod_TC	•VIIRS-MOD-RGEO-TC	•None	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsGranulateBathymetry
15	•GridRowCol_Mod_TC	•VIIRS-MOD-GRC-TC	•None	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsGranulateBathymetry
23	•Geolocation_Mod_TC_Unext	•VIIRS-MOD-RGEO-TC-UNEXT	•	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsGranulateGeopotentialHeight
43	•Geolocation_Mod_TC	•VIIRS-MOD-RGEO-TC	•None	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsGranulateNitrateDepletion
49	•Geolocation_Mod_TC_Unext	•VIIRS-MOD-RGEO-TC-UNEXT	•	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsGranulateOzone
52	•Geolocation_Mod_TC_Unext	•VIIRS-MOD-RGEO-TC-UNEXT	•	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsGranulatePrecipWater
55	•Geolocation_Mod_TC_Unext	•VIIRS-MOD-RGEO-TC-UNEXT	•	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsGranulatePresLev

	Data Product Name	Collection Short Name	Mnemonic	Sending SRS	Receiving SRS	Sending Function	Receiving Function
							elTemp
58	•Geolocation_Mod_TC_Unext	•VIIRS-MOD-RGEO-TC-UNEXT	•	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsGranulateSkinTemp
61	•Geolocation_Mod_TC_Unext	•VIIRS-MOD-RGEO-TC-UNEXT	•	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsGranulateSpecSurfHumidity
64	•Geolocation_Mod_TC_Unext	•VIIRS-MOD-RGEO-TC-UNEXT	•	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsGranulateSurfGeopotentialHeight
71	•Geolocation_Mod_TC_Unext	•VIIRS-MOD-RGEO-TC-UNEXT	•	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsGranulateSurfPres
74	•Geolocation_Mod_TC_Unext	•VIIRS-MOD-RGEO-TC-UNEXT	•	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsGranulateSurfTemp
75	•Terrain-Eco-ANC-Tile	•Terrain-Eco-ANC-Tile	•AN_NP-L10100-003	Anc and Aux Data	Grid Gran	Static Ancillary Data	ProAncViirsGranulateTerrainGeopotentialHeight
76	•Geolocation_Mod_TC •GridRowCol_Mod_TC	•VIIRS-MOD-RGEO-TC •VIIRS-MOD-GRC-TC	•None •None	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsGranulateTerrainGeopotentialHeight
79	•Geolocation_Mod_TC_Unext	•VIIRS-MOD-RGEO-TC-UNEXT	•	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsGranulateTropoGeopotentialHeight
82	•Geolocation_Mod_TC_Unext	•VIIRS-MOD-RGEO-TC-UNEXT	•	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsGranulateWaterVaporMixRatio
85	•Geolocation_Mod_TC_Unext	•VIIRS-MOD-RGEO-TC-UNEXT	•	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsGranulateWindDirection
88	•Geolocation_Mod_TC_Unext	•VIIRS-MOD-RGEO-TC-UNEXT	•	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsGranulateWindSpeed

	Data Product Name	Collection Short Name	Mnemonic	Sending SRS	Receiving SRS	Sending Function	Receiving Function
92	•Geolocation_Mod_TC_Unext	•VIIRS-MOD-RGEO-TC-UNEXT	•	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProAncViirsPerformSurfPresCorrection
143	•DayNight_Band •GridRowCol_DNB •Geolocation_DNB_DEG	•VIIRS-DNB-SDR •VIIRS-DNB-GRC •VIIRS-DNB-GEO	•SDRE-VDNB-C0030 •None •None	Store/Retrieve (VIIRS SDR)	VIIRS Imagery	Retrieve Products	ProEdrViirsNccImagery
185	•Geolocation_Mod_TC	•VIIRS-MOD-RGEO-TC	•None	Store/Retrieve (VIIRS SDR)	Grid Gran	Retrieve Products	ProGipViirsGranToGridDSR
241	•GridRowCol_Mod	•VIIRS-MOD-GRC	•None	VIIRS RDR/SDR	VIIRS RDR/SDR	ProSdrViirsGeoExtender	ProSdrViirsBrightPixel

3.3.2   Outputs

Not applicable.

3.4   Science Standards

Not applicable.

3.5   Metadata Output

Not applicable.

3.6   Quality Flag Content Requirements

Not applicable.

3.7   Data Quality Notification Requirements

Not applicable.

3.8   Adaptation

Not applicable.

3.9   Provenance Requirements

Not applicable.

3.10   Computer Software Requirements

Not applicable.

3.11   Software Quality Characteristics

Not applicable.

3.12   Design and Implementation Constraints

SRS.01.07_159 The JPSS Common Ground System shall execute the Gran to Grid algorithms.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 3.0.0

SRS.01.07_969 The JPSS Common Ground System shall execute the Grid to Grid algorithms.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 3.0.0

3.13 Personnel Related Requirements

Not applicable.

3.14 Training Requirements

Not applicable.

3.15 Logistics Related requirements

Not applicable.

3.16 Other Requirements

Not applicable.

3.17 Packaging Requirements

Not applicable.

3.18 Precedence and Criticality

Not applicable.

3.19 Historical Requirements

SRS.01.07_161 The Grid-to-Grid software shall incorporate a computing algorithm provided for data reduction and gridding of the VIIRS NBAR NDVI Rolling Tile gridded IP.

Rationale: Algorithms are established in accordance with the JPSS VIIRS Earth Gridding ATBD (D0001-M01-S01-027).

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.0.0

SRS.01.07_162 The Gran-to-Grid software shall incorporate a computing algorithm provided for gridding of a merged VIIRS Snow Cover Binary Map EDR and Sea Ice Concentration IP with a gridded Global Multisensor Automated Snow/Ice (GMASI) Map into a Snow/Ice Cover Rolling Tile gridded IP.

Rationale: Algorithms are established in accordance with the JPSS VIIRS Earth Gridding ATBD (D0001-M01-S01-027). The Snow/Ice Cover Gridded IP is updated with information of the Snow Cover EDR process, Ice information from the Ice Concentration IP, and ancillary data from the NOAA Global Multisensor Automated Snow/Ice Map.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.0.0

SRS.01.07_164 The Grid-to-Grid software shall incorporate a computing algorithm provided for gridding and post-compositing the SR-BT-VI Monthly Final Tile gridded IP.

Rationale: Algorithms are established in accordance with the JPSS VIIRS Earth Gridding ATBD (D0001-M01-S01-027).

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.0.0

SRS.01.07_168 The Grid-to-Grid software shall incorporate a computing algorithm provided for albedo and gridding of the VIIRS Land Surface Albedo 17-day Tile gridded IP.

Rationale: Algorithms are established in accordance with the JPSS VIIRS Earth Gridding ATBD (D0001-M01-S01-027).

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.0.0

SRS.01.07_991 The Grid-to-Grid software shall incorporate a computing algorithm provided for data reduction and gridding of NBAR-NDVI-Monthly and NBAR-NDVI-17-day Tile gridded IPs.

Rationale: Algorithms are established in accordance with the JPSS VIIRS Earth Gridding ATBD (D0001-M01-S01-027).

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.0.0

SRS.01.07_992 The Grid-to-Grid software shall incorporate a computing algorithm provided for albedo and gridding of BRDF Archetypal 17-day Tile gridded IP.

Rationale: Algorithms are established in accordance with the JPSS VIIRS Earth Gridding ATBD (D0001-M01-S01-027).

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.0.0

SRS.01.07_178 The ANC-to-Grid software shall reformat the NOAA Global Multi-sensor Automated Snow Ice Cover (GMASI) to a Snow/Ice Cover Rolling Tile gridded IP format.

Rationale: The GMASI ancillary inputs need to match the format for the desired output data product Snow/Ice Cover Rolling Tile gridded IP.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.0.0

SRS.01.07_181 The granulation software shall granulate time interpolated versions of the NCEP GFS forecasts to a VIIRS granulation.

Rationale: The ancillary inputs need to match the granulation for the desired output data product. The 3 and 6 hour forecasts are granulated in normal modes of operation. In graceful degradation, extended forecasts up to 24 hours may be used.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.0.0

SRS.01.07_963 The granulation software shall regranulate time interpolated versions of the NCEP GFS forecasts to an OMPS granulation.

Rationale: The ancillary inputs need to match the granulation for the desired output data product. The 3 and 6 hour forecasts are granulated in normal modes of operation. In graceful degradation, extended forecasts up to 24 hours may be used.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.0.0

SRS.01.07_182 The granulation software shall granulate time interpolated versions of the NAAPS Total Optical Depth forecast to a VIIRS granulation.

Rationale: The ancillary inputs need to match the granulation for the desired output data product. The 3 and 6 hour forecasts are granulated in normal modes of operation. In graceful degradation, extended forecasts up to 24 hours may be used.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.0.0

SRS.01.07_965 The granulation software shall granulate time interpolated versions of the NAVGEM forecasts to an OMPS granulation.

Rationale: The ancillary inputs need to match the granulation for the desired output data product. The 3 and 6 hour forecasts are granulated in normal modes of operation. In graceful degradation, extended forecasts up to 24 hours may be used.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.0.0

SRS.01.07_966 The granulation software shall regranulate select VIIRS products to an OMPS granulation.

Rationale: The following VIIRS products are regranulated for use in OMPS processing: Gridded Snow/Ice Cover IP, Snow Cover EDR, Ice Surface Temperature EDR, and Quarterly Surface Type Ancillary data.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.0.0

SRS.01.07_183 The granulation software shall granulate time interpolated versions of the NAVGEM forecasts to a VIIRS granulation.

Rationale: The ancillary inputs need to match the granulation for the desired output data product. The 3 and 6 hour forecasts are granulated in normal modes of operation. In graceful degradation, extended forecasts up to 24 hours may be used.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.0.0

SRS.01.07_974 The VIIRS Snow/Ice Cover Gran IP software shall set <FillField> to <FillValue> according to <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for Ancillary Data, Gridding and Granulation (474-00448-04-07) <SnowIceCover_GranIP><fill>.

Rationale: The IP software through its computing algorithm must fill the VIIRS Snow/Ice Cover Gran IP values if downstream processes require fill values for the empty grid in the template tile based on the established fill conditions to satisfy exclusion and fill conditions.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.2.0

SRS.01.07_975 The VIIRS Gridded Snow/Ice Cover Rolling Tile software shall set <FillField> to <FillValue> according to <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for Ancillary Data, Gridding and Granulation (474-00448-04-07) <SnowIceCover_GridIP><fill>.

Rationale: The Gridded IP software must supply values for all on-earth VIIRS Snow/Ice Cover Rolling Tile Gridded IP cells. When valid data is not available, the GIP will not be updated. Off earth tiles contain FILL in general but this is not updated by the Gridded IP software.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.2.0

SRS.01.07_976 The VIIRS SR-BT-VI Monthly Final Tile software shall set <FillField> to <FillValue> according to <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for Ancillary Data, Gridding and Granulation (474-00448-04-07) <MonthBT-SR-VI_GridIP><fill>.

Rationale: The Gridded IP software must supply values for all land VIIRS SR-BT-VI Monthly Final Tile Gridded IP cells. When valid data is not available, the GIP will not be updated. Off earth tiles contain FILL in general but this is not updated by the Gridded IP software.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.2.0

SRS.01.07_977 The VIIRS Land Surface Albedo 17-day Tile software shall set <FillField> to <FillValue> according to <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for Ancillary Data, Gridding and Granulation (474-00448-04-07) <LSA_GridIP><fill>.

Rationale: The Gridded IP software must supply values for all land VIIRS Land Surface Albedo 17-day Tile Gridded IP cells. When valid data is not available, the GIP will not be updated. Off earth tiles contain FILL in general but this is not updated by the Gridded IP software.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.2.0

SRS.01.07_978   The VIIRS NBAR NDVI Rolling Tile software shall set <FillField> to <FillValue> according to <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for Ancillary Data, Gridding and Granulation (474-00448-04-07) <Roll-NBAR-NDVI_GridIP><fill>.

Rationale: The Gridded IP software must supply values for all land VIIRS NBAR NDVI Rolling Tile Gridded IP cells. When valid data is not available, the GIP will not be updated. Off earth tiles contain FILL in general but this is not updated by the Gridded IP software.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.2.0

SRS.01.07_987   The VIIRS Snow/Ice Cover IP software shall ingest tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Ancillary Data Handling Gridding and Granulation (474-00448-02-07).

Rationale: This defines the formats for Lookup Tables, and Processing Coefficients for input into the algorithm module.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.2.0

SRS.01.07_170   The Grid-to-Grid software shall generate the VIIRS Land Surface Albedo 17-day Tile in conformance with the XML format file in Attachment A.1 of the JPSS Algorithm Specification Vol II: Data Dictionary for Ancillary Data Handling Gridding and Granulation (474-00448-02-07).

Rationale: The product profile must conform to the XML format file.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.2.0

SRS.01.07_171   The Grid-to-Grid software shall generate the VIIRS NBAR NDVI Rolling Tile Gridded IP in conformance with the XML format file in Attachment A.2 of the JPSS Algorithm Specification Vol II: Data Dictionary for Ancillary Data Handling Gridding and Granulation (474-00448-02-07).

Rationale: The product profile must conform to the XML format file.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.2.0

SRS.01.07_172   The Gran-to-Grid software shall generate the VIIRS Snow/Ice Cover Rolling Tile Gridded IP in conformance with the XML format file in Attachment A.5 of the JPSS Algorithm Specification Vol II: Data Dictionary for Ancillary Data Handling Gridding and Granulation (474-00448-02-07).

Rationale: The product profile must conform to the XML format file.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.2.0

SRS.01.07_173 The Grid-to-Gran software shall generate the VIIRS Snow/Ice Cover 750m IP in conformance with the XML format file in Attachment A.6 of the JPSS Algorithm Specification Vol II: Data Dictionary for Ancillary Data Handling Gridding and Granulation (474-00448-02-07).

Rationale: The product profile must conform to the XML format file.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.2.0

SRS.01.07_174 The Grid-to-Grid software shall generate the VIIRS Surface Reflectance, Brightness Temperatures, & Vegetation Index Monthly Final gridded IP in conformance with the XML format file in Attachment A.7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Ancillary Data Handling Gridding and Granulation (474-00448-02-07).

Rationale: The product profile must conform to the XML format file. Note that this product is for the final tile.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.2.0

SRS.01.07_145 The VIIRS Land Surface Albedo 17-day Tile software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for Ancillary Data, Gridding and Granulation (474-00448-04-07) <LSA_GridIP><QF>.

Rationale: Quality Flags must be generated based on the established flag conditions, logic, and format.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.2.0

SRS.01.07_970 The JPSS Common Ground System shall execute the Grid to Gran algorithms.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor. The CGS is responsible for Grid-To-Gran algorithms producing Snow/Ice Cover, QST, LSA, and NBAR NDVI Gran IPs.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.2.0

SRS.01.07_163 The JPSS Common Ground System shall execute a computing algorithm for granulating the VIIRS Snow/Ice Cover 750m granulated IP.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0   *Block End:* 2.2.0

Appendix A.   Requirements Attributes

The Requirements Attributes can be found in the VCRMs at Ground > Mission System Engineering > Ground SEIT Unrestricted > VCRM

https://jpss.gsfc.nasa.gov/sites/ground/MSE/9/Forms/AllItems.aspx?RootFolder=%2Fsites%2Fground%2FMSE%2F9%2FVCRM&FolderCTID=0x012000D0555EA1A211E64A9A7DE7CBCE72DE8B&View=%7B4267AEFE%2D7E8B%2D402D%2D919D%2D41BED55BA4E7%7D