Suomi NPP EDR Validated Maturity Readiness Review
JPSS STAR Program Update

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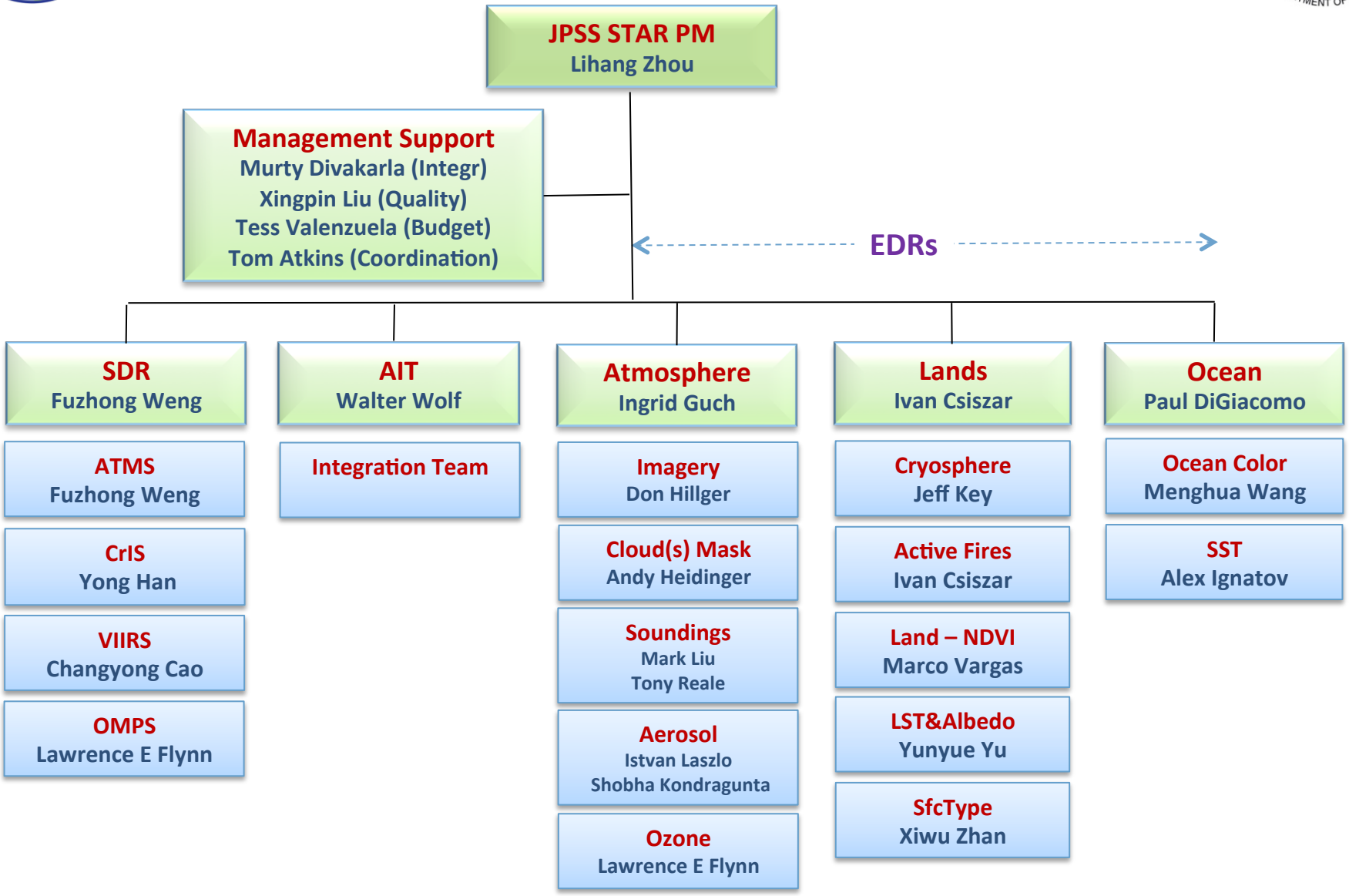
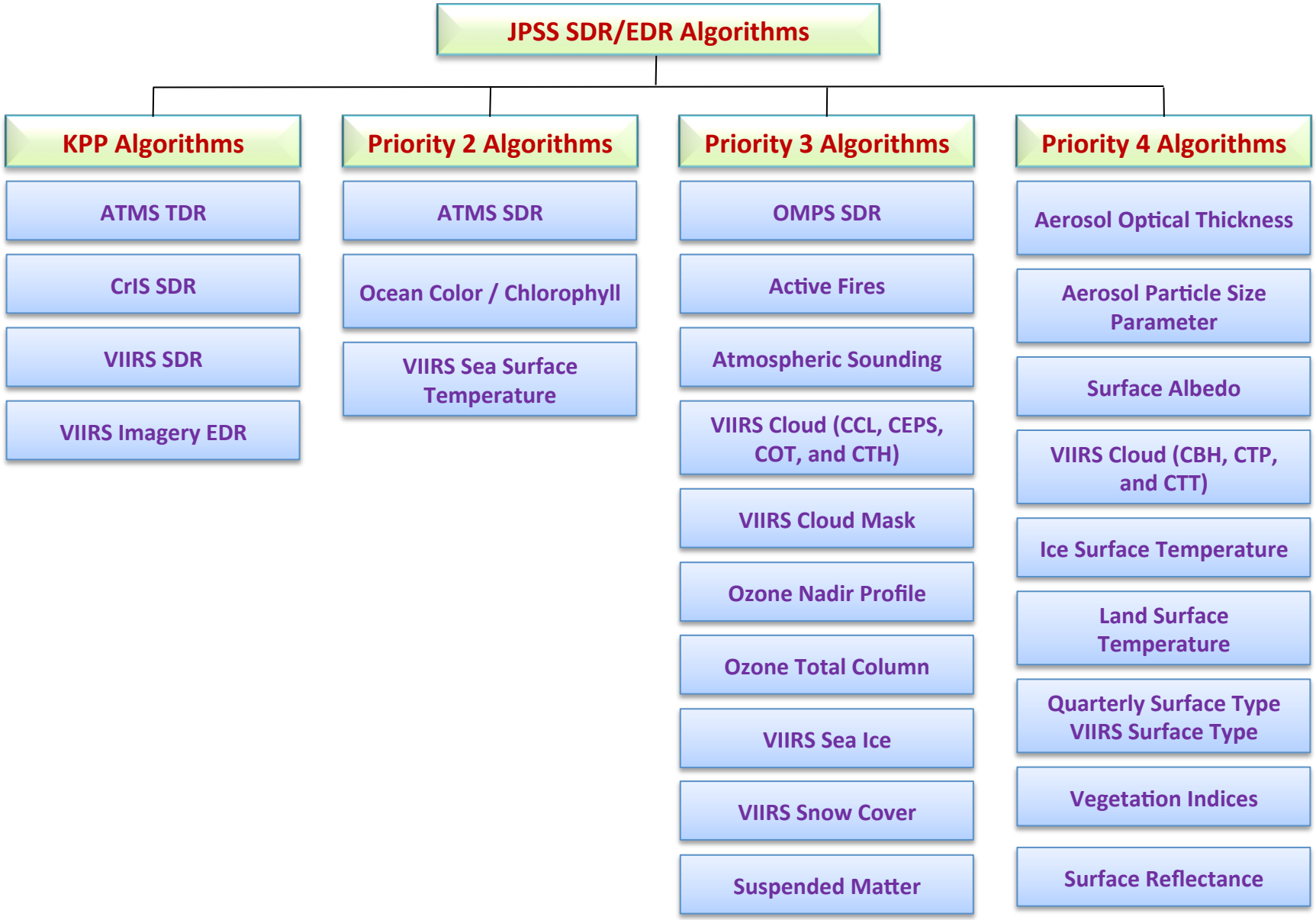
Sept 3rd 2014

JPSS STAR Program



JPSS SDR/EDR Algorithms



SNPP/JPSS Operational xDRs
Product Maturity, Verification & Validation

Product performance is well defined over a range of representative conditions using a small number of independent measurements (stage 1), using a widely distributed set of measurements from many locations and time periods (stage 2), and using statistically robust independent measurements representing global conditions (stage 3).

Long Term Monitoring
User Applications

- Product Quality may not be optimal
- Incremental product improvements are still occurring
- Version control is in effect
- General research community is encouraged to participate in the QA and validation but need to be aware that product validation and QA are ongoing
- May be replaced in the archive when the validated product becomes available
- Ready for operational evaluation

Validated Maturity
Stage 1, Stage 2, Stage 3
Validation with Truth Data Sets

xDR Provisional Maturity
Optimization of xDR Algorithm
IDPS Version Updates
ADL Emulations
Assessment with Truth Data Sets

xDR Beta Maturity
Optimization of xDR Algorithm
IDPS Version Updates
ADL Emulations
Assessment with Truth Data Sets

- Early release product; Minimally validated; May still contain significant errors.
- Versioning not established until a baseline is determined.
- Available to allow users to gain familiarity with data formats and parameters.
- Product is not appropriate as the basis for quantitative scientific publication studies and applications.

xDR Algorithm
Pre-Launch to Post-Launch Adaptation

xDR Algorithm
Pre-Launch Setup And Instrument Test Data

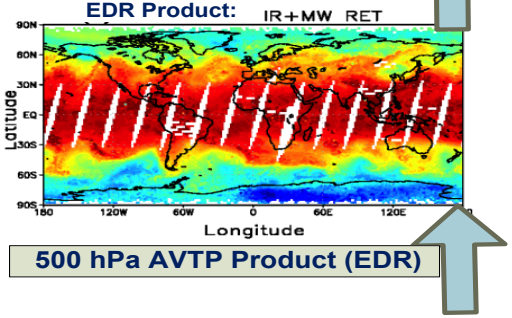
Atmospheric Vertical Temperature Profile (AVTP)
Measurement Uncertainty – Layer Average Temperature Error

PARAMETER	THRESHOLD
AVTP Clear, surface to 300 mb	**1.6 K / 1-km layer**
AVTP Clear, 300 to 30 mb	1.5 K / 3-km layer
AVTP Clear, 30 mb to 1 mb	1.5 K / 5-km layer
AVTP Clear, 1 mb to 0.5 mb	3.5 K / 5-km layer
AVTP Cloudy , surface to 700 mb	**2.5 K / 1-km layer**
AVTP Cloudy, 700 mb to 300 mb	1.5 K / 1-km layer
AVTP Cloudy, 300 mb to 30 mb	1.5 K / 3-km layer
AVTP Cloudy, 30 mb to 1 mb	1.5 K / 5-km layer
AVTP Cloudy, 1 mb to 0.5 mb	3.5 K/ 5-km layer

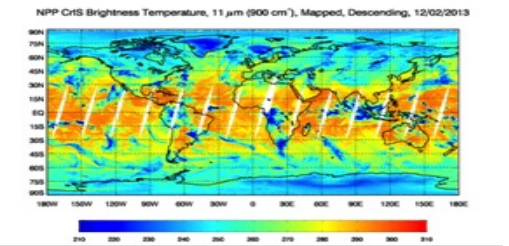
Atmospheric Vertical Moisture Profile (AVMP)
Measurement Uncertainty – 2-km Layer Average Mixing Ratio % Error

PARAMETER	THRESHOLD
AVMP Clear, surface to 600 mb	**Greater of 20% or 0.2 g/kg / 2-km layer**
AVMP Clear, 600 to 300 mb	Greater of 35% or 0.1 g/kg / 2-km layer
AVMP Clear, 300 to 100 mb	Greater of 35% or 0.1 g/kg / 2-km layer
AVMP Cloudy, surface to 600 mb	**Greater of 20% of 0.2 g/kg / 2-km layer**
AVMP Cloudy, 600 mb to 400 mb	Greater of 40% or 0.1 g/kg / 2-km layer
AVMP Cloudy, 400 mb to 100 mb	Greater of 40% or 0.1 g/kg / 2-km layer

Source: JPSS L1RD Requirements V2.9



500 hPa AVTP Product (EDR)



CrIS 900 cm^{-1} Radiance in BT (SDR)

SNPP EDR Validation Stages Maturity Definition

Validated Stage 1:

Using a limited set of samples, the algorithm output is shown to meet the threshold performance attributes identified in the JPSS Level 1 Requirements Supplement with the exception of the S-NPP Performance Exclusions

Validated Stage 2:

Using a moderate set of samples, the algorithm output is shown to meet the threshold performance attributes identified in the JPSS Level 1 Requirements Supplement with the exception of the S-NPP Performance Exclusions

Validated Stage 3:

Using a large set of samples representing global conditions over four seasons, the algorithm output is shown to meet the threshold performance attributes identified in the JPSS Level 1 Requirements Supplement with the exception of the S-NPP Performance Exclusions

JPSS-1 Product Maturity Definition

JPSS/GOES-R Data Product Validation Maturity Stages – COMMON DEFINITIONS (Nominal Mission)

1. **Beta**
   - Product is minimally validated, and may still contain significant identified and unidentified errors.
   - Information/data from validation efforts can be used to make initial qualitative or very limited quantitative assessments regarding product fitness-for-purpose.
   - Documentation of product performance and identified product performance anomalies, including recommended remediation strategies, exists.

2. **Provisional**
   - Product performance has been demonstrated through analysis of a large, but still limited (i.e., not necessarily globally or seasonally representative) number of independent measurements obtained from selected locations, time periods, or field campaign efforts.
   - Product analyses are sufficient for qualitative, and limited quantitative, determination of product fitness-for-purpose.
   - Documentation of product performance, testing involving product fixes, identified product performance anomalies, including recommended remediation strategies, exists.
   - Product is recommended for operational use (user decision) and in scientific publications.

3. **Validated**
   - Product performance has been demonstrated over a large and wide range of representative conditions (i.e., global, seasonal).
   - Comprehensive documentation of product performance exists that includes all known product anomalies and their recommended remediation strategies for a full range of retrieval conditions and severity level.
   - Product analyses are sufficient for full qualitative and quantitative determination of product fitness-for-purpose.
   - Product is ready for operational use based on documented validation findings and user feedback.
   - Product validation, quality assurance, and algorithm stewardship continue through the lifetime of the instrument.

SNPP Product Science Maturity Status

Products		Status Sep-13	Status Sep-14
SDR	ATMS	Provisional	Validated
	CrIS	Provisional	Validated
	VIIRS	Provisional	Validated
	OMPS	Provisional	Validated
EDR	Imagery (non-NCC)	Provisional	Validated
	Imagery NCC	Provisional	Validated
	VIIRS Cloud Mask	Provisional	Validated
	Cloud Properties	Beta	Validated
	Aerosol Optical Thickness	Provisional	Validated
	Aerosol Particle Size Parameter	Provisional	Validated
	Suspended Matter	Beta	Beta
	Active Fires	Provisional	Validated
	Land Surface Temperature	Provisional	Provisional
	Surface Type	Beta	Provisional
	Surface Albedo	Beta	Provisional
	Vegetation Indicies	Provisional	Validated
	Surface Reflectance IP	Provisional	Validated
	Ocean Color / Chlorophyll	Beta	Provisional
	Sea Surface Temperature	Beta	Validated
	Ice Surface Temperature	Provisional	Validated
	Sea Ice Characterization	Beta	Validated
	Snow Cover - Binary Mask	Beta	Validated
	Snow Cover - Fraction	Beta	Validated
	Sounding (NUCAPS)	Provisional	Validated
	OMPS Ozone EDR	Provisional	Validated

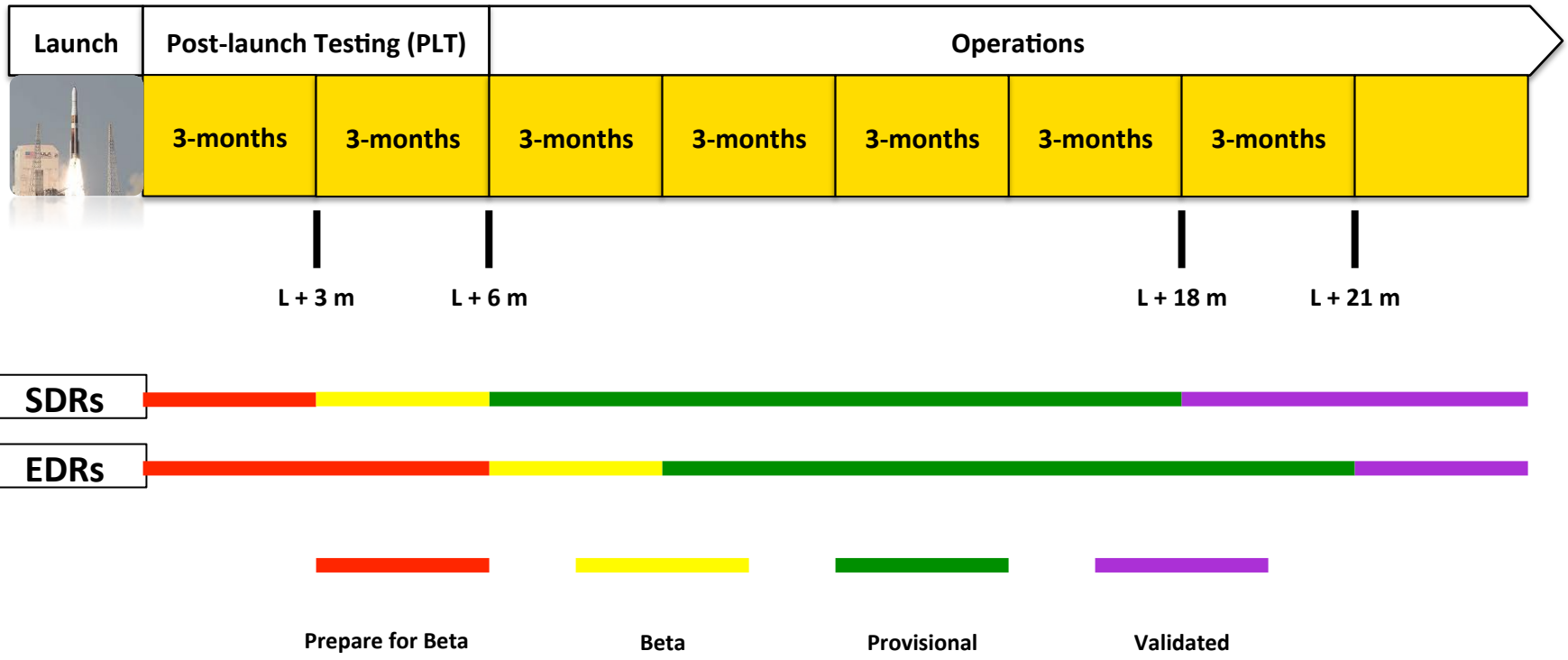
	Beta	Provisional	Validated

SNPP/JPSS Science Products
Major JPSS-1 Planned Updates Highlighted

- **SDR Products**
  - ATMS Application Packet, RDR, TDR, SDR Algorithm and Products
  - **CrIS Application Packet, RDR, SDR Algorithm and Products**
  - VIIRS Application Packet, RDR, SDR and Products
  - **OMPS Nadir Application Packet, RDR, and SDR Algorithms and Products**
- **Long-Term Monitoring System (ICVS)**
  - SDR Long-Term Monitoring (LTM) System
  - EDR Long-Term Monitoring (LTM) System

- **EDR Products**
  - VIIRS Imagery EDR Algorithms and Products
  - **Ocean Color / Chlorophyll Algorithms and Products**
  - VIIRS Sea Surface Temperature Algorithms and Products
  - VIIRS Cloud Mask Algorithms and Products
  - VIIRS Clouds Properties Algorithms and Products
  - **Active Fires Algorithms and Products**
  - Surface Albedo Algorithms and Products
  - Land Surface Temperature Algorithms and Products
  - **Vegetation Indices Algorithms and Products**
  - VIIRS Surface Type Algorithms and Products
  - VIIRS Sea Ice Algorithms and Products
  - **VIIRS Snow Cover Algorithms and Products**
  - Ice Surface Temperature Algorithms and Products
  - Aerosol Optical Thickness Algorithms and Products
  - Aerosol Particle Size Parameter Algorithms and Products
  - **Suspended Matter Algorithms and Products**
  - Atmospheric Sounding Algorithms and Products
  - OMPS Ozone Profile EDR Algorithms and Products
  - OMPS Ozone Total Column EDR Algorithms and Products

JPSS-1 Cal/Val Timeline (Nominal)



- Beginning of each color represents when product enters a given validation stage.

DRAFT

Day 1 – Atmosphere and Ocean domains
September 3

8:30 – 8:45	Opening remarks and logistics	Lihang Zhou & Ingrid Guch
8:45 – 10:15	Soundings	Mark Liu
10:15 – 10:30	Break	
10:30 – 12:00	Cloud Properties	Andy Heidinger
12:00 – 1:00	Lunch	
1:00 – 2:30	Ozone	Larry Flynn
2:30 – 2:45	Break	
2:45 – 4:15	SST	Sasha Ignatov
4:15 – 5:00	Panel Discussion	EDR Review Panel

Day 2 – Land and Cryosphere domains, September 4

8:30 – 9:30	Snow Cover Fraction	Jeff Key
9:30 – 10:30	Sea Ice Characterization	Jeff Key
10:30 – 10:45	Break	
10:45 – 12:15	Active Fires	Ivan Csiszar
12:15 – 1:15	Lunch	
1:15 – 2:45	Surface Reflectance	Eric Vermote
2:45 – 3:00	Break	
3:00 – 4:30	Vegetation Index	Marco Vargas
4:30 – 5:00	Panel Discussion	EDR Review Panel