



Read-me for Data Users

MEMORANDUM FOR: The JPSS Program Record
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SUBJECT: NOAA-20 VIIRS-VH Validated maturity status
DATE: 03/21/2019

Validated maturity status declaration for VIIRS-VH

Maturity Review Date: 03/21/2019
Effective Date: 03/21/2019
Operational System: VIIRS-VH, Version 2.0

The JPSS Algorithm Maturity Readiness Review Board approved the release of the **VIIRS-VH** Product to the public with a Validated maturity level quality as of **03/21/2019** (effective date), based on JPSS Maturity Review held on **03/21/2019**.

1. Maturity stage definition (reference to the AMM webpage for maturity definition:
<http://www.star.nesdis.noaa.gov/jpss/AlgorithmMaturity.php>)

2. Algorithm Description:

List of Products (Collection Short Name (CSN))

Vegetation Health (VH) Indices of the EDR are weekly composite products. It consists of three indices, Vegetation Condition Index (VCI), Thermal Condition Index (TCI) and Vegetation Health Index (VHI).

Product requirements/Exclusions: VH product requirements are documented in the Joint Polar Satellite System (JPSS) Level 1 Requirements Supplement (L1RDS). The current version of the L1RDS is available at http://www.jpss.noaa.gov/technical_documents.html. The VH product requirements are also documented in the JPSS ESPC Requirements Document (JERD) Volume 2: Science Requirements Version 2.0.

Quality flags (Table)

The validation was done by event cases, not by pixels. No new quality flag was added to product file.

Product evaluation/validation

Validation of VH-EDR is conducted via cross-comparison of VH-EDR and inter-comparisons of VH-EDR's images, digital data and their spatial and temporal trends. The validation data includes: (1) The official USA and NOAA/NESDIS VH products (2) Data and products from other sensors (SNPP-VIIRS, MODIS, AVHRR, SPOT etc) or other product suite (GIMMS) and (3) In situ data (a- Drought indicators (USDM, Palmer, SPI, Precipitation anomaly, temperature anomaly etc), b - crop yield, c- crop conditions, d - economic indicators, E - users' response and others). VH-EDR requires weekly and time-

series based validation, primarily related to its ability to capture spatial and temporal vegetation variations.

Product availability/reliability

VIIRS-VH EDR data have been generated offline at STAR since 11/30/2017. With this validated maturity declaration, the NESDIS will work to promote the VH algorithm to operations.

Algorithm performance dependence

- (1) Calibration of VIIRS reflectivity bands I1, I2
- (2) I5 measurements
- (3) Conversion of reflective and emissive channels to NDVI and BT, respectively
- (4) Changes from SNPP/VIIRS to NOAA-20/VIIRS
- (5) Noise removal from NDVI and BT and producing no noise SMN from NDVI and SMT from BT
- (6) Climatology changes

Known errors/issues/limitations

n/a

3. Changes since last maturity stage

More comparison work shows that with more time, N20 VIIRS smoothed products (SMN and SMT) display better agreement with those of SNPP VIIRS products, as the median filter applied in the products, which need 7 weeks to mature.

4. Review board recommendations

5. Path Forward/Future Plan

Planned further improvements

- a. Update SMN & SMT climatology due to climate warming
- b. Update changes from SNPP/VIIRS to NOAA-20/VIIRS

Planned Cal/Val activities/milestones

- (1) Validate by standard Vegetation Health and drought products
- (2) Validate by similar products from other satellites (AVHRR, MODIS, SPOT etc) and other product suites (GIMMS etc)
- (3) Validate by crop and pasture production data for countries and admin. regions
- (4) Validate by comparing with other events
- (5) Validate by agricultural assessments
- (6) Validate by economic indicators
- (7) Validate by users response

6. Additional Items to note

Additional information is available in the VIIRS-VH algorithm theoretical basis document (ATBD) and validation maturity review briefing, which can be accessed at:

<http://www.star.nesdis.noaa.gov/jpss/Docs.php>



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