**Vegetation Index EDR Product Description**

The Vegetation Index EDR provides the Normalized Difference Vegetation Index (NDVI), the Enhanced Vegetation Index (EVI), and per-pixel quality flags (QFs) at 375 m. The NDVI is derived from Top-of-Atmosphere (TOA) I1 and I2 bands

\[ \text{NDVI} = \frac{I_2 - I_1}{I_2 + I_1} \]

The EVI is derived from Top-of-Canopy (TOC) I1 and I2, and M3 bands

\[ \text{EVI} = \left(1 + L\right) \cdot \frac{I_2 - I_1}{I_2 + I_1 - 2C_1 \cdot I_1 - L} \]

where

- \( I_1 \) - red band (0.62 - 0.68 um)
- \( I_2 \) - NIR band (0.79 - 0.87 um)
- \( L \) - green band (0.45 - 0.52 um)
- \( C_1 \) - atmospheric correction coefficient

**SNPP VIIRS Vegetation Index EDR Validation Results**

![Matchup Analysis. Surface Reflectance and VI Cautions collected daily at 2:19 AEST time. North America Example](image)

**VIIRS vs. MODIS Global Comparison**

- Radiometric accuracy of VIIRS VI EDR were evaluated and extraterrestrial global snow comparison with Aqua MODIS
- Long-term observation using coincident orbiting bands
- Atmosphere corrected surface reflectance product of VIIRS VI EDR
- Some of these data are available through global coverage
- Surface reflectance products of VIIRS VI EDR
- TOA reflectance products of VIIRS VI EDR
- TOA and Surface reflectance products of VIIRS VI EDR

**VIIRS vs. Tower NDVI Time Series**

![Example of Cautions of TOA NDVI at Barrency, First 3 weeks of April](image)

**Product Performance Estimates**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Name</th>
<th>eBay</th>
<th>Estimated</th>
<th>Error Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIIRS NDVI Accuracy</td>
<td>0.16</td>
<td>0.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VIIRS NDVI Uncertainty</td>
<td>0.02</td>
<td>0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOA NDVI Accuracy</td>
<td>0.15</td>
<td>0.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOA Ecosystem</td>
<td>0.16</td>
<td>0.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOA NDVI Uncertainty</td>
<td>0.02</td>
<td>0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOA NDVI Ecosystem</td>
<td>0.15</td>
<td>0.07</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SNPP VIIRS Vegetation Index EDR Quality Flags**

![Image](image)

These additional QFs related to the VI EDR platform as such Mx8.4.

**Vegetation Index EDR Product Timeline**

*Product is available in public, but it should be used with caution, known problems, frequent changes*

**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

**Path Forward – Planned Improvements**

- Implementation of DR7039 - TOC-EVI backup algorithm
- Implementation of DR7697 – Redefine Granule Level Summary QF and pro Pixel Overall QFs
- Implementation of DR 7041, Code change and implementation of a revised EVI equation
- Temporal compositing (weekly, 16-day, monthly), and spatial compositing (global) (DR7488)
- JPSS TOC NDVI Test Readiness Review (Oct 2014)
- JPSS TOC NDVI Algorithm Readiness Review (Mar 2015)

**User Precautions**

Known issues to date are described below:

- Cloud Shadows QF is currently known to overestimate shadow affected areas. Use this flag with caution
- Aerosol Quantity QF. Use this flag to identify the source of aerosol information and the degree of aerosol contamination in individual pixels
- Cloud Adjacency QF. This flag can overestimate affected areas.
- Snow/Cloud QF. Use this flag to screen pixels with suspicious EVI values over snow/ice-covered surfaces
- Incremental improvements in the VIIRS VI-EVI operational product are expected as the quality of the upstream products (VCM-IP and SR-IP as well as Aerosol Optical Thickness IP) continues to improve
- TOC EVI data can contain unrealistic high/low values over snow/ice covered areas at high latitudes, over clouds, and over cloud shadows.
- The quality of the VI-EVI is sensitive to the performance of the VIIRS Cloud Mask (VCM) and Surface Reflectance (SR) Intermediate Products (IPs)

**Vegetation Index EDR Data Access**

The primary source for S-NPP products is via NOAA’s Comprehensive Large Array-Data Stewardship System (CLASS) web site (http://www.class.ngdc.noaa.gov/ saa/products/welcome). Data delivered to CLASS from the Interface Data Processing Segment (IDPS) has a latency of 6 hours.

**Acknowledgements and Disclaimer**

This work has been supported by the NOAA JPSS Office (NJO). The views, opinions, and findings contained in this poster are those of the author(s) and should not be construed as an official National Oceanic and Atmospheric Administration or U.S. Government position, policy, or decision.