SECOND NASA DIRECT READOUT CONFERENCE (NDRC) WEBINAR

May 15, 2019

MINUTES

Purpose/Objectives of the NDRC Webinar Series
At 11:00 a.m. Brad Quayle (USDA FS GTAC) convened the second webinar of the NASA Direct Readout Conference (NDRC) Webinar series. He reviewed the purpose of the NDRC, activities to date, and objectives going forward. This webinar agenda featured three presentations:

- NASA VIIRS Level-1 Software/Algorithm (NASA), presented by Fred Patt (NASA/GSFC);

- Processing of Suomi-NPP VIIRS Data for Near Real-time Applications: Observations on VFIRE375 Active Fire Products, presented by Yugandhar Reddy (ISRO/NRSC); and

- NASA Black Marble, presented by Mr. Quayle on behalf of Miguel Roman (USRA EfSI).

Mr. Quayle's presentation, including webinar wrap-up slides, is available here:
https://directreadout.sci.gsfc.nasa.gov/links/rsd_eosdb/PDF/NDRC_Webinar_Series_20190515 - Quayle.pptx

The post-webinar survey (less than 3 minutes to complete) is available at: https://www.surveymonkey.com/r/NDRC-May2019

NASA VIIRS Level-1 Software/Algorithm (NASA)
Mr. Patt presented the current status of NASA VIIRS Level-1 software and algorithm development efforts. Since his presentation at the 2016 NASA Direct Readout Conference, two releases of the software have been completed, with features to enhance the VIIRS data products and support NOAA-20 (previously JPSS-1) VIIRS processing. The software is operational at all three NASA Science Investigator-led Processing Systems (SIPS), and is available in both the NASA DRL's International Planetary Observation Processing Package (IPOPP) and the Ocean Biology Processing Group's (OBPG) SeaDAS packages.

Question for Mr. Patt:

Q: Are there any improvements in resolution (to avoid the merging of pixels and bowtie processing on board)?
A: Resolution is constrained by the instrument.

Mr. Patt's presentation is available here:
https://directreadout.sci.gsfc.nasa.gov/links/rsd_eosdb/PDF/L1ASWG for NDRC Webinar 15 May 2019.pptx

Processing of Suomi-NPP VIIRS Data for Near Real-time Applications: Observations on VFIRE375 Active Fire Products

Mr. Reddy's presentation focused on the process and challenges involved in generating VIIRS 375 meter active fire products, and ISRO/NRSC's observations/evaluation of the products. Topics included the potential of S-NPP VIIRS 375m data for identifying smaller and cooler fires in the Indian region; spurious fires generated by VFIRE375_SPA v2.5.1; and evaluation and advantages of the latest VFIRE375_SPA v3.0.0 provided by the DRL over the previous version in terms of removal of false detections, data compatibility (e.g., use of netCDF products instead of C-SDR products) and relevant issues.

The National Remote Sensing Centre (NRSC) is one of the centres of the Indian Space Research Organisation (ISRO). NRSC is responsible for remote sensing satellite data acquisition and processing, data products generation and dissemination, development of remote sensing applications using satellite data, aerial remote sensing, and decision support for disaster management. NRSC has a state-of-the-art ground station, the Integrated Multi-mission Ground Segment for Earth Observation Satellites (IMGEOS) at Shadnagar near Hyderabad, India. The IMGEOS infrastructure facilitates data acquisition and processing for a suite of Indian Remote Sensing (IRS) satellites as well as for different foreign satellite sensors such as MODIS (on-board Terra and Aqua), VIIRS (on-board S-NPP and NOAA-20) and the Landsat missions.

The active fire products are currently generated at IMGEOS using Science Processing Algorithms (SPAs) provided by the NASA DRL to process MODIS and VIIRS data. The present set-up for the fire production and dissemination system is a totally automated chain, wherein active fire alert information (satellite pass-wise) in the form of shapefiles and text files are sent to the user departments within 1 hour of Loss Of Signal (LOS). The information is also web-published through ISRO's geo-visualization web portal, Bhuvan. The main stakeholders/users are national and state bodies governed by the Ministry of Environment, Forests and Climate Change, India.

Questions for Mr. Reddy:

Q: How are the active fire detection data provided to the Forest Survey of India (FSI)? Are the derived data products transferred (ASCII data or GeoTiffs), or does FSI consume NRSC Web products/services?
A: FSI accesses data via a password-protected account and SMS text.

Q: Does the NRSC do any ground truth validations for fire detections?
A: NRSC does not conduct any validation exercises for the VIIRS or MODIS fire products. NRSC is responsible for generating and disseminating active fire alerts to the user departments, primarily FSI. FSI, as the primary user does value-addition (in terms of spatial decision support) and gives the information to the nodal officers of different state forest departments for fire mitigation and management. FSI in turn receives feedback from the nodal officers on the usability/utility of the data. Validation is thus achieved. In our earlier exercises on evaluation of MODIS fire products (in corroboration with high

resolution optical data), we found that there are no/negligible commission errors, while very cool and smaller fires are missed (omission). In the case of VIIRS, we have already communicated our evaluation of the VFIRE375 SPA versions 2.5.1 and 3.0 with the NASA DRL.

Q: Are there any plans to provide confidence level for clear ground no-fire detection [i.e., is there a confidence level for a non-fire (omission)]?
A: Confidence level is provided as part of the shapefile as derived by the algorithm.

Q: Is there a way to access data from Indian Remote Sensing satellites?
A: Fire data can be accessed at: http://bhuvan.nrsc.gov.in/bhuvan_links.php. Satellite data from other ISRO satellites must be requested directly from NRSC via email to ndc@nrsc.gov.in. Data sources up to 50 meters are provided free of charge, but there is a cost associated with higher resolution data.

Mr. Reddy's presentation is available here:
https://directreadout.sci.gsfc.nasa.gov/links/rsd_eosdb/PDF/ndrc_webinar_nrsc_presentation.pdf

NASA Black Marble
On behalf of Mr. Roman, Mr. Quayle provided updates on the current status of NASA Black Marble production activities using S-NPP VIIRS Day/Night Band (DNB) data and its application as part of the NASA Disasters Program in assessing impacts and recovery from disaster events. In the summer of 2019 a NASA-sponsored Black Marble training program, consisting of a 3-week webinar series, will be conducted via the NASA Applied Remote Sensing Training (ARSET) Program. More information is available at: https://arset.gsfc.nasa.gov/.

Questions for Mr. Quayle:

Q: How different is the Black Marble from the monthly time composites of DNB in terms of radiometry available through NOAA NGDC?
A: The VIIRS Black Marble VNP46A1 and VNP46A2 products are not monthly composites. They are Level 3 products composed of nightly cloud-free, BRDF-corrected VIIRS DNB radiance data. The NOAA NGDC products are nighttime radiance VIIRS DNB data averaged over a monthly period to provide monthly composite products of nighttime lights. NGDC also provides annual nighttime lights products based on temporal averaging of VIIRS DNB data over a one year period. Additional information is available at: https://ngdc.noaa.gov/eog/viirs/download_dnb_composites.html.

Q: How are you achieving 30 meter resolution even though native resolution is 750 meter?
A: The Black Marble HD product is generated through the synergistic use of the daily NASA Black Marble standard product with data from other Earth-observing satellites (e.g., Landsat-8 and Sentinel-2) and ancillary data sources (street, building, and other GIS

layers). This means it is still the native 750 meter data that has been spatially "sharpened," using the higher resolution imagery and GIS information.

Q: Do the night lights detections have associated confidence levels?
A: Confidence levels for the night light detections are not provided for the VIIRS Black Marble VNP46A1 and VNP46A2 products. However, both products include a cloud mask layer. The QA metadata for the cloud mask layer contains confidence indicators for the cloud detection results on a per-pixel basis.

Mr. Roman's presentation is available here:
https://directreadout.sci.gsfc.nasa.gov/links/rsd_eosdb/PDF/NASA Black Marble Product Status - Roman.pptx

Black Marble reference material is available here:
https://directreadout.sci.gsfc.nasa.gov/links/rsd_eosdb/PDF/Black_Marble_References.pdf

Meeting Wrap-up
Mr. Quayle thanked Mr. Patt and Mr. Reddy for their presentations, as well as the DRL for providing logistics support. Mr. Quayle stressed the value of participant feedback as we evaluate future software technologies and algorithms, and prioritize resources accordingly to meet the needs of the global user community. He invited participants to submit feedback and additional suggestions for future webinar topics to him directly via email, and encouraged participants to complete a post-webinar survey (less than 3 minutes to complete) available at: https://www.surveymonkey.com/r/NDRC-May2019. Mr. Quayle adjourned the webinar at 1:00 p.m.

Next Webinar
The next webinar is planned for August 2019. Additional details will be provided via the Direct Broadcast Users email alias.