

LANCE Enhancement Request
Daily rolling NDVI product

Overview:

The purpose of the suggested enhancement is to generate and distribute a near real-time 8 day rolling NDVI product to support the dust modeling, weather forecasting and agricultural monitoring communities.

1. Identify and summarize the effort.

1a. Who is requesting the effort?

Arlindo DaSilva, NASA/GSFC with support from members of the International Cooperation for Aerosol Prediction (ICAP)

A subsequent request was received from the GEO Secretariat representing the agricultural community.

1b. Who is completing the effort? (Provider)

LANCE MODAPS in collaboration with GLAM (Global Agricultural Monitoring - a joint NASA, USDA, UMD initiative)

1c. Is there a HQ or Science sponsor?

Brad Dorn, Program Manager for Agriculture, Carbon, and Water applications in the Applied Science Program. NASA Headquarters.

2. Scientific and/or application objective achieved through enhancement:

Say a few words about how this enhancement will improve science or contributed to the application of the NRT data?

i) For the Modeling Community

Operational aerosol forecasting is now carried out on a routine basis in several centers around the world including NOAA/NCEP, NASA/GSFC/GMAO, ECMWF, NRL, and UK Met Office. Additional information can be found on the International Cooperative for Aerosol Forecasting (ICAP) website: <http://bobcat.aero.und.edu/jzhang/ICAP/>

The parameterization of dust emissions in these models are generally formulated in terms of a static dust source function, modulate by surface parameters such as wind speed, soil moisture as well as the vegetative state at a particular time and location. The rolling, NRT estimates of NDVI is intended to provide these models with a more recent and accurate depiction of the vegetation state, affording a more reliable estimate of dust emissions.

In addition to its application to dust emissions, NDVI and more directly LAI retrievals can potentially be used in NRT to inform the land surface parameterizations in weather forecasting models.

ii) For the Agricultural Monitoring Community

Near real-time satellite data from LANCE are routinely used for agricultural monitoring by the USDA FAS and other national and international organizations. NDVI composites produced every 8 days provide crop analysts with up to date information on crop conditions and indicators of potential crop yield. Crops develop rapidly during the growing season and crop forecasts must be released in a timely fashion (in the case of USDA on by the 11th of every month). As such it is critical to have timely and frequent NDVI data available over global croplands. A daily rolling 8 day NDVI product would help to meet this requirement of the agricultural monitoring community.

Historical data and imagery required for comparison purposes would not be archived by LANCE however users could access the science quality MxD09Q1 data and create the NDVI product or alternatively access it from the GLAM system at UMD.

3. Concept of operations:

3a. Location of functionality

An NDVI algorithm is presently run at GLAM (housed at MODAPS) for the agricultural monitoring community as a sequential 8-day product with a 250m resolution. By running the code daily a rolling 8-day NDVI data product will be produced. To meet the needs of the dust and aerosol modeling community, the product will also be made available at 0.1 of a degree. The HDF product will be distributed via LANCE-MODIS ftp site; image products will be generated made available via GIBS (Global Browse Imagery Services) and Worldview.

3b. Development, integration and testing process

Network connections will be set up according to appropriate security guidelines. Processes to transfer the data and imagery, and verify the transfer will be developed. Existing processes of creating imagery from similar data types will be adapted. Final examination of data and imagery products will be undertaken by representatives of the end user groups.

3c. Support (FTEs) for development and sustaining engineering

Development, integration, and testing of production rules: 60-90 person hours (senior programmer).

Sustaining engineering would be integrated with ongoing LANCE and GIBS efforts and would be a very marginal increase in effort, 12-15 person hours (senior programmer/system administrator)

3d. What is the plan for approving the work is completed?

Sample NDVI products from LANCE-MODIS will be sent to the GLAM team for approval, and, if necessary to other members of the MODIS Science Team for validation.

4. Notional schedule:

How long will it take to complete this work? When would it start?

The work will start in May 2013 and will take approximately 4 months to be completed.

5. Endorsements

Endorsements received from the following are attached as PDF files in Annex 1:

Goran Pejanovic, Hydro-meteorological Service of Srbija and SEEVCCC
Dr. Masao Mikami, Japan Meteorological Agency
Joao Soares, GEO Secretariat Scientific Expert for Agriculture, Geneva
Dr. Angela Benedetti, European Centre for Medium-Range Weather Forecasts
Dr. Carlos M. Di Bella, INTA_FAUBA-CONICET, Argentina
Brad Doorn, Program Manager, Applied Science Program, NASA HQ

Subject: FW: ndvi products
Date: Monday, 11 March 2013 17:04:02 Greenwich Mean Time
From: Diane Davies
To: Davies, Diane K. (GSFC-6180)[SIGMA SPACE CORPORATION]

From: Goran Pejanović [goran.pejanovic@hidmet.gov.rs]
Sent: Friday, November 02, 2012 10:54 AM
To: Diane Davies
Subject: ndvi products

Dear Dr. Davies,

We, at National Hydro-meteorological Service of Srbija and SEEVCCC, entirely support the request to generate and distribute an 8 day rolling NDVI product in LANCE-MODIS on a near-real time basis. We anticipate using such a product for operational dust forecast (we are also participating in WMO SDS/WAS) and for other topic related to weather and climate forecast and monitoring.

Sincerely,
Goran Pejanovic
assistant director in RHMZS

Your Name
Your role, Institution



22 November 2012

Dr. Diane Davies
Sigma Space Corporation
Goddard Space Flight Center
National Aeronautics and Space Administration
USA

Dear Dr. Davies,

We at the Meteorological Research Institute of the Japan Meteorological Agency support the request to generate and distribute an 8-day rolling NDVI product in LANCE-MODIS on a near-real time basis. We anticipate using such a product to improve the operational Asian dust forecasts of JMA. MRI/JMA is an active participant in the International Cooperative for Aerosol Prediction (ICAP), a cooperative of aerosol system developers looking towards the next generation of aerosol models and data assimilation systems. The NDVI product is indispensable for our research and development activities.

Sincerely yours,

Masao Mikami, Ph.D
Director of the Environmental and Applied Meteorology Research Department
Meteorological Research Institute
Japan Meteorological Agency

Subject: Request to produce NDVI product to support the G-20 GEOGLAM initiative

Date: Friday, 8 March 2013 15:29:24 Greenwich Mean Time

From: João Soares

To: Davies, Diane K. (GSFC-6180)[SIGMA SPACE CORPORATION]

Dear Diane Davies,

The Geo Secretariat endorses the request for NASA LANCE to produce a daily near-real time 8-day rolling NDVI product. This timely, daily NDVI data will help to improve the capacity for timely agricultural monitoring and will support the G-20 GEOGLAM initiative. We truly believe this data will be used routinely by the community involved with assessment of crop conditions throughout the growing calendars, wherever and whenever the data becomes available.

With appreciation,

Joao Soares

GEO Secretariat Scientific Expert for Agriculture

7-bis, avenue de la Paix

1211 Geneva 2- CH

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Subject: FW: interest in NDVI and albedo products
Date: Wednesday, 20 March 2013 09:22:01 Greenwich Mean Time
From: Diane Davies
To: Davies, Diane K. (GSFC-6180)[SIGMA SPACE CORPORATION]

Diane Davies
Phone: 202 470 2568 (skypein number)
UK Phone: +44 (0)1684 584774
Email: ddavies@hermes.geog.umd.edu

From: Angela Benedetti [Angela.Benedetti@ecmwf.int]
Sent: Monday, March 18, 2013 12:01 PM
To: Diane Davies
Subject: interest in NDVI and albedo products

Dear Dr. Davies,

We at ECMWF support the request to generate and distribute an 8-day rolling NDVI product in LANCE-MODIS. We would also be very keen on a 16-day rolling NRT MODIS albedo product (UV-visible and near-infrared, isometric, volumetric and geometric components). Such product would be used to develop albedo data assimilation. We can also foresee its usefulness in the aerosol modelling (identification of emission sources for natural aerosol, i.e. deserts).

Sincerely,
Angela Benedetti

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Dr. Angela Benedetti
Aerosol Data Assimilation Scientist
Chemical Aspects Section
European Centre for Medium-Range Weather Forecasts
Shinfield Park, Reading, Berkshire, RG2 9AX, UK
Tel +44 118 949 9063
E-mail Angela.Benedetti@ecmwf.int
<http://www.gmes-atmosphere.eu/aerosols>

Subject: Rolling 8-day NDVI product from LANCE
Date: Tuesday, 19 March 2013 11:26:38 Greenwich Mean Time
From: Carlos Marcelo Di Bella
To: Davies, Diane K. (GSFC-6180)[SIGMA SPACE CORPORATION]
CC: Inbal Becker-Reshef

Dear Dr. Davies:

INTA supports the request to generate a daily near-real time 8-day rolling NDVI product within the NASA Land Atmosphere Real time Capability for EOS system. We would use this product within our GLAM-Argentina system in support of our agricultural monitoring activities for Argentina.

Sincerely,

Carlos Di Bella

--

Dr. Carlos M. Di Bella
INTA-FAUBA-CONICET
Nicolas Repetto y de los Reseros s/n
(1686), Hurlingham, Buenos Aires
ARGENTINA
+541146210125 (int 110)
email: carlos.m.dibella@gmail.com

Subject: Fwd: NDVI enhancement for LANCE - ready for HQ endorsement
Date: Wednesday, 27 March 2013 12:20:15 Greenwich Mean Time
From: Doorn, Bradley (HQ-DK000)
To: Davies, Diane K. (GSFC-6180)[SIGMA SPACE CORPORATION]
CC: Justice Chris

Diane, I definitely support the NDVI enhancement-Rolling NDVI. Let me know if you need more info. Brad

Bradley Doorn, Ph.D
NASA, Earth Science Division
Washington, DC

Begin forwarded message:

From: Chris Justice <justice@hermes.geog.umd.edu>
Date: March 15, 2013, 1:11:27 PM EDT
To: "Doorn, Bradley (HQ-DK000)" <bradley.doorn@nasa.gov>
Cc: Inbal Becker-Reshef <ireshef@hermes.geog.umd.edu>
Subject: FW: NDVI enhancement for LANCE - ready for HQ endorsement

Brad
See email draft request to you below

The Lance UWG needs HQ endorsement for additions to the system - this rolling NDVI is an obvious one for Ag and you are the appropriate authority at HQ
Sorry I missed you at Langley on Thursday
Hoping we can all meet am on Thursday 28th at HQ

Chris

Chris Justice
Professor and Chair
Department of Geographical Sciences
University of Maryland

From: Davies, Diane K. (GSFC-6180)[SIGMA SPACE CORPORATION] [diane.k.davies@nasa.gov]
Sent: Friday, March 15, 2013 7:29 AM
To: Chris Justice
Cc: Murphy, Kevin J. (GSFC-5860)
Subject: NDVI enhancement for LANCE - ready for HQ endorsement

Hello Chris

Please find attached the LANCE enhancement request for the rolling NDVI product. Please could you forward this to Brad Doorn requesting his formal endorsement of the request on behalf of NASA Applied Sciences. Kevin flagged that we need a US letter of support. We are waiting on this from Ed Heyer at NRL (he wants to do some analysis to show the value added the product will provide)

I drafted an email to Brad (pasted below) based on the email Kevin sent to Lawrence to get approval for the NRL AOD product – to which Lawrence responded that he concurred. Perhaps you could send the attached to Brad and I follow up with the email below? If you prefer to handle it another way that is fine too. Please let me know how you want to proceed.

On a separate note – you still have an outstanding action item from the last LANCE UWG
UWG to formulate a request for LANCE capability for VIIRS (currently this is not a LANCE project responsibility). C.Justice - come up with response and circulate to all forcomments.

Thanks!
Diane

Hello Brad,

I am contacting you because we are under the impression that you concur with LANCE producing the NRT Daily rolling NDVI 8-day product. Chris Justice conveyed to me that he has spoken with you about this product and the request for LANCE to integrate the code for product generation. If you concur with this request, please could you reply to this email approving this request as a HQ sponsor. Please contact me if you have any questions,

Regards
Diane