

LANCE Enhancement Request

16 Day Rolling Surface Albedo Product

Overview:

The purpose of the suggested enhancement is to generate and distribute the (Collection 6) MODIS rolling surface albedo product in LANCE-MODIS on a near-real time basis to support the worldwide air quality and atmospheric modeling communities.

Required Information for Enhancement Request:

1. *Identify and summarize the effort.*

1a. *Who is requesting the effort? (User)*

Arlindo da Silva, GMAO, NASA GSFC

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

LANCE MODAPS

1c. *Is there a HQ or Science sponsor?*

The effort has been endorsed by David Considine, Manager, Modelling Analysis and Prediction Program, NASA HQ.

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

As part of Collection 6, a daily Surface Reflectance MODIS BRDF / Albedo Parameter product will be produced by MODAPS and stored at the LP DAAC. The current schedule has C6 Land algorithms going in to forward production in late-May or June 2013.

2a. *Say a few words about how this enhancement will improve science or contributed to the application of the NRT data?*

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.

In temperate climates, seasonal changes in vegetation phenology can occur in a matter of days and dramatically change the surface optical properties. MODIS employs multiple looks over a 16-day period to constrain surface albedo for aerosol modeling. Remote sensing methods that rely on the MODIS albedo products for constraint of surface properties can experience large uncertainties as well as temporal discontinuities during these transitions.

A rolling production schedule would minimize the times and locations where rapid vegetation change causes uncertainty in the surface spectral albedo, which impact other retrievals that depend on these data, including the NRL/UND Value-Added Aerosol Optical Depth MCDAODHD.

3. Concept of operations:

3a. Location of functionality

The functionality will be co-located with LANCE MODIS

3b. Development, integration and testing process

The 16 Day Rolling Surface Albedo Product is a Level 3 filtered, corrected, and aggregated product.

The algorithm will be installed as a stand-alone PGE, test results will be generated and validated against the test data.

Further, approximately 16 days of the product for Aqua and Terra will be generated on the LANCE-MODIS backup machine for performance test purposes to determine the additional hardware resources needed to support continued production of the present LANCE-MODIS product within the 3-hour latency requirement. These products will be provided to both the NRL and UND teams for validation.

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

The following is a breakout of the effort in FTEs for the development of the requirements and the development and implementation of the production rules in LANCE-MODIS for Daily Rolling Surface Albedo:

- Development of the requirements shown below: 40 person hours (senior systems analyst and development team)
- Development, integration, and testing of production rules: 66-96 person hours (senior programmer)
- Sustaining engineering: 12-15 person hours (senior programmer/system administrator)

The cost estimates will be refined during the requirements phase.

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

Sample Daily Rolling Surface Albedo products from LANCE-MODIS will be sent to the GSFC Aerosols group and, if necessary to other members of the MODIS Science Team for validation.

4. Notional schedule:

4a. How long will it take to complete this work? When would it start?

MODAPS will begin work on this task as soon as they receive approval from the MODIS Science Team to start. It is expected that the Rolling Surface Albedo product would be available in LANCE within 4 months and browse imagery within 6 months.

5. Endorsements

Angela Benedetti, European Centre for Medium-Range Weather Forecasts

NRL - expected

Subject: Fwd: Quick question

Date: Thursday, 21 March 2013 20:14:20 Greenwich Mean Time

From: Dasilva, Arlindo M. (GSFC-6101) (sent by moraes.dasilva@gmail.com <moraes.dasilva@gmail.com>)

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

Diane,

David Considine will be our sponsor, see below....

Arlindo

----- Forwarded message -----

From: **Considine, David B. (HQ-DK000)** <david.b.considine@nasa.gov>

Date: Thu, Mar 21, 2013 at 2:41 PM

Subject: Re: Quick question

To: "Dasilva, Arlindo M. (GSFC-6101)" <arlindo.m.dasilva@nasa.gov>

Hi Arlindo,

I would be happy to be a sponsor of this request. I am very interested in seeing aerosol data assimilation moving forward, and I support the request for NRT MODIS albedo and NDVI products in order to facilitate and improve aerosol and aerosol-related data assimilation efforts.

David

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David B. Considine, Ph.D.
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From: <Dasilva>, "Arlindo M. (GSFC-6101)" <arlindo.dasilva@nasa.gov>

Date: Thursday, March 21, 2013 11:27 AM

To: David Considine <david.b.considine@nasa.gov>

Subject: Quick question

Hi David,

Very quick. I am in the LANCE UWG and I have been trying to petition for NRT products of interest by the international aerosol forecasting community. We are moving forward with a request for NRT MODIS albedo and NDVI products that us, NCEP, NRL and ECMWF are endorsing.

One of LANCE's requirements is that we have a HQ sponsor. For a change, you do not need to provide any funds, just a nod. Do you agree being a sponsor of this request?

Thank you,

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
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