

# NACP ACCESS



PI: Jeff Morisette  
Co-Is: Robert Wolfe, Bill Ridgway,  
Mike Teague, Ed Masuoka



NASA GSFC, Greenbelt, MD  
GSFC Laboratory for Terrestrial Physics,  
Terrestrial Information System Branch (614.5)

Improving access to Land and Atmosphere science products from Earth Observing Satellites: Helping NACP investigators better utilize MODIS data products.

An Advancing Collaborative Connections for Earth-Sun System Science (ACCESS) project

Land Use Land Use Change Science Team Meeting, Apr. 11, 2006

## Background and overview

NACP ACCESS is a NASA-funded project supporting the upcoming North American Carbon Program (NACP), a component of the USGCRP Carbon Cycle Science Program. The purpose of this ACCESS project is to provide researchers with MODIS data products that are custom tailored for use in NACP model studies.

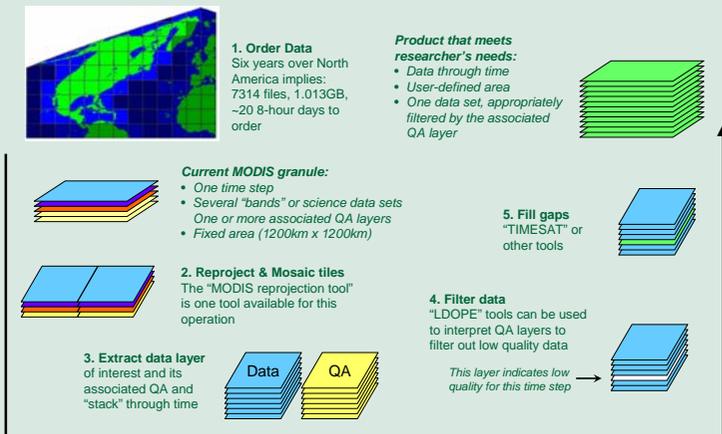
The NACP is designed to provide the scientific underpinning to inform future policy decisions involving the carbon cycle, such as managing carbon sources and sinks by efficient and effective options to reduce emission or enhance carbon sinks. Information from earth observing satellites plays a major role in providing spatial and temporal information required to address the carbon accounting sought by the NACP. The program hopes to capitalize on the information gained from the current generation of satellite data. In particular, MODIS is expected to play a major role in regional and global analysis inherent to NACP.

Our strategy is to offer a wide range of processing capabilities to be applied to any of the MODIS land and atmosphere products for a focus group of NACP investigators. This would involve 5-10 investigators in year one. During this first year we will develop the capacity to provide these investigators with very specific products that precisely match their needs. In year two we will expand the number of users to ~30 while assessing which requests/tools are most common among users. Year three would then develop an operational capacity for the most requested and/or critical tools.

The research community requires that EOS platforms provide regional time-dependent parameters as well as long-term global data for climate studies. Regional analyses like NACP are connecting atmospheric constituents (mainly greenhouse gases) with surface processes on the land and ocean. MODIS data are key to providing detailed spatial and temporal information about the surface condition and dynamics as well as refining physical models of diverse phenomena such as aerosol/cloud interactions, radiative forcing and aerosol/chemical transport. We are addressing a major challenge for researchers, namely, acquiring EOS data at suitable spatial-temporal resolutions and in formats consistent with data integration into model studies

## Assembly of a MODIS product for NACP users

NASA-funded NACP investigators are currently experiencing significant challenges in their attempts to utilize MODIS data. Current tools provide a fraction of the functionality needed and there remains significant overhead involved with ingesting and processing MODIS data for a particular use. The additional effort required to process the MODIS products is often prohibitive.



## Preprocessing capabilities

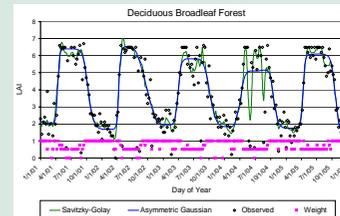
The following preprocessing capabilities will be available to the NACP users:

- Reprojection (to NACP regional map projection)
- File format conversion (e.g., GeoTIFF, ASCII and Binary)
- Mosaicing (from 10 x 10 deg. Tiles to Regional Coverage)
- Subsample (in space or by date layer)
- Resample (aggregate) spatial resolution (to coarser grid)
- Modification of temporal composites (changing time steps)
- QA filtering and gap filling (temporal and spatial)
- Ancillary model data
- Machine to machine requests (services)

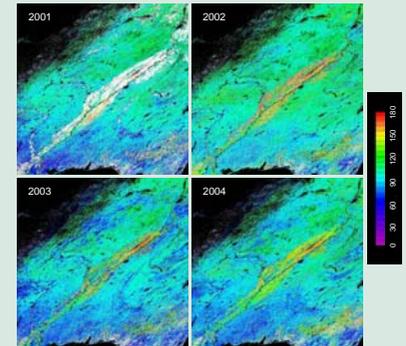
## Preliminary results from Timesat

MODIS LAI, 5 years  
South-Eastern US  
(Tile h10v05, Collection 4)

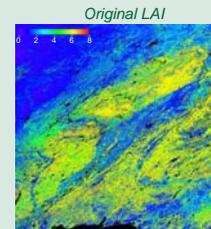
Time series for point c581/r1094



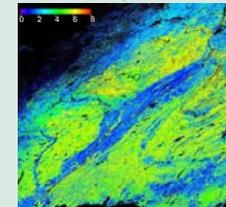
Start of Season Asymmetric-Gauss (day of year)



LAI temporal smoothing and gap filling (2001/185 - July 4)



Smoothed LAI Asymmetric-Gauss



## Schedule

Year 1: develop core system based on selected NACP investigators needs  
Year 2: deliver full system capability to larger group of NACP users  
Year 3 (optional): develop an operational capacity for the most requested and/or critical tools

