Compositing
Description

Compositing is one of the procedures to get better land products. It consists of a combination of daily images to generate a single image that results in a cloud free land product over temporal intervals. This method reduces the noise due to the clouds and atmospheric constituents [Jonsson et. al. 2004]. The compositing can be the first filter to get a better and more accurate time series data. One type of composting is the maximum value composite (MVC). MVC compares all the images taken by a satellite, such as MODIS, during a pre-defined period of time and selects the pixels with the highest vegetation index value since it is assume that contamination reduces the VI values [Viovy et. al. 1992].

Process

Compositing is used to improve the quality of the resulting time series, to eliminate residual noise and poor quality data and to reduce the data record sizes.

- We combine multiple daily images and generate a single cloud and problem free image over a predefined temporal interval.
- This method reduces noise due to clouds, atmospheric constituents [Jonson et. al. 2004].
- We're employing three methods for compositing:
  - The N# Constrained View Maximum Value Composite (CV-MVC): Selects the N pixels with the highest vegetation index value, then selects the one with smallest view. Assumes contaminants reduce the VI values [Viovy et. al. 1992].
  - Average of All filtered/high quality data
  - Average of the top N Max Values
- We're generating 15-day (bimonthly) and monthly datasets

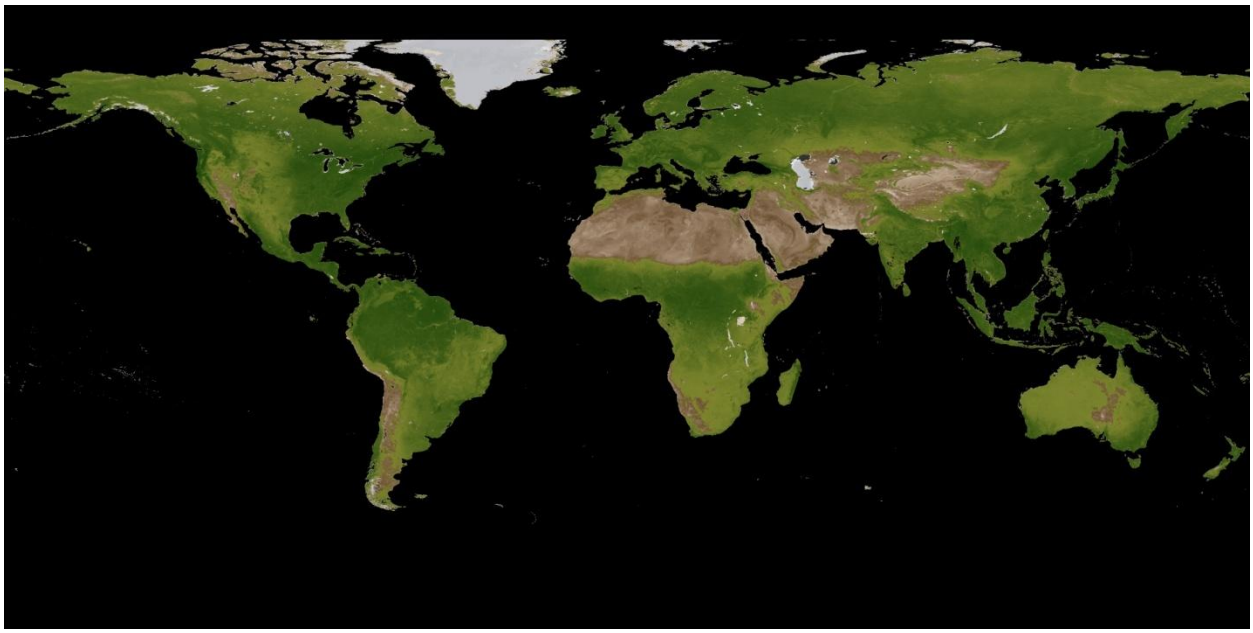

Figure 1: Compositing from 1995 to 2000 (DOY244, 1999)

Data set Characteristics

Temporal Coverage	1981 – 2010
Area	Global
File Size	~440 MB
Projection	Latitude/Longitude
Data Format	HDF-EOS
Dimensions	3600 x 7200 rows/columns
Resolution	0.05 degrees (5600 meters)
Science Data Sets (SDS HDF Layers)	4
Location	/VIP/DATA/MEASURES/

Science Data Sets (HDF Layers) (7)	UNITS	BIT TYPE	FILL	VALID RANGE	MULTIPLY BY SCALE FACTOR
NDVI Average	Vegetation Index	16-bit signed integer	-15000	-10000–10000	0.0001
NDVI Standard Deviation		Float 32 signed integer	-15000	-0-1	NA
EVI2 Average		16-bit signed integer	-15000	-10000–10000	0.0001
EVI2 Starndard Deviation		Float 32 signed integer	-15000	0-1	NA
Number of Pixels		8-bit signed integer	0	0–1000	0.1
Q&A		8-bit signed integer	-	0–1000	0.1
Rank		8-bit signed integer	-9999	-1000–1000	0.0001

References

Jonsson, P., Eklundh, L. "TIMESAT-a program for analizing time-series of satellite sensor data". Computers Geosciences (2004). 30, 833-845.

Viovy, N., Arino, O. & Belward, A. S. "The best index slope extraction (BISE): A method for reducing noise in NDVI time series". International Journal of Remote Sensing (1992), 13, 1585-1590.