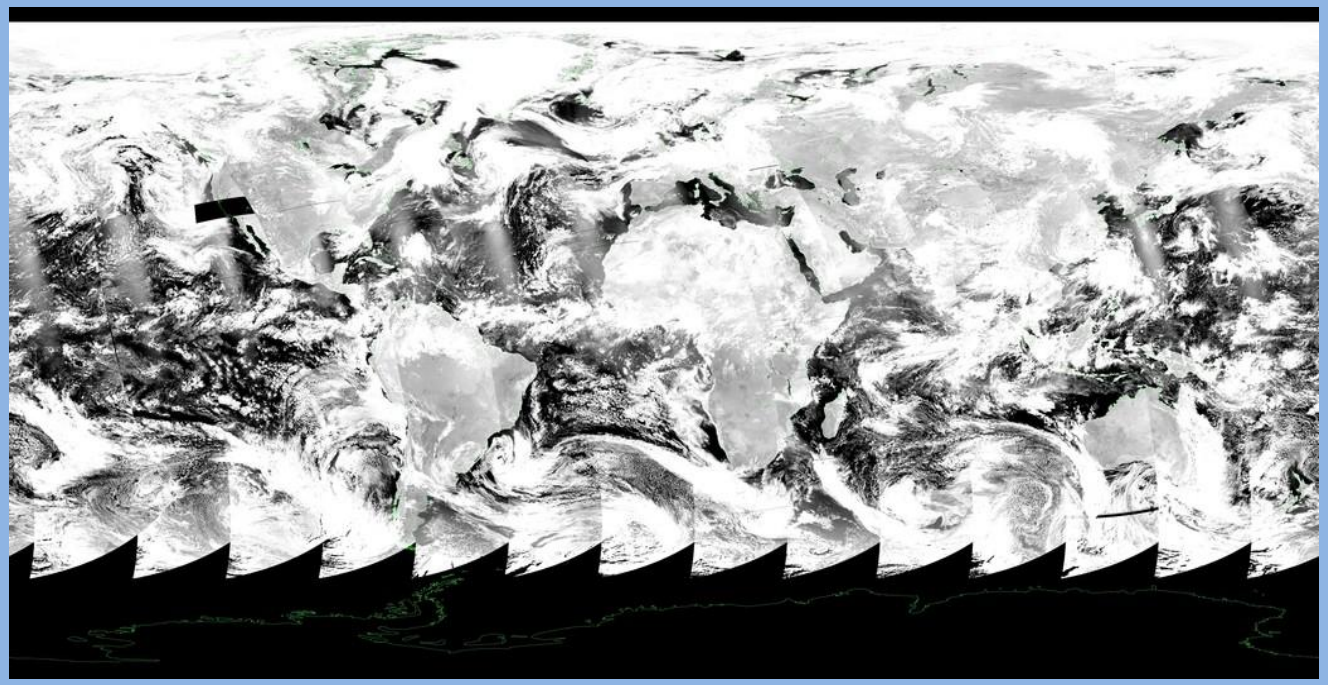
Advanced Very High Resolution Radiometer -AVHRR



http://ltdr.nascom.nasa.gov

AVHRR– General Information

- Coverage: Daily Global Data
- Product version: V3
- Data Period: 1980 - 2000
- Resolution: CMG, 0.05 degrees (5600 meters)
- Projection: Unprojected, Latitude/Longitude
- Data format: HDF-EOS
- Image dimensions: 3600 Rows, 7200 Cols

HDF Layer Specifications

Science Data Sets	UNITS	BIT TYPE	FILL	VALID RANGE	MULTIPLY BY SCALE FACTOR
Surface Reflectance 640 nm	Reflectance	16-bit signed integer	-9999	-1000–1000	0.0001
Surface Reflectance 860 nm	Reflectance	16-bit signed integer	-9999	-1000–1000	0.0001
Brightness Temperature 3.75 microns	Kelvins	16-bit signed integer	-9999	0 - 1000	0.1
Brightness Temperature 11.0 microns	Kelvins	16-bit signed integer	-9999	0–1000	0.1
Brightness Temperature 12.0 microns	Kelvins	16-bit signed integer	-9999	0–1000	0.1
Surface Reflectance 3.75 microns	Reflectance	16-bit signed integer	-9999	-1000–1000	0.0001
Solar Zenith Angle	Degree	16-bit signed integer	-9999	-9000–9000	0.01
View Zenith Angle	Degree	16-bit signed integer	-9999	-7000–7000	0.01
Relative Azimuth	Degree	16-bit signed integer	-9999	-18000–180000	0.01
Quality Assurance	Bit Field	16-bit signed integer	0	0–15	na

Data State QA Descriptions

Bit No.	Parameter Name	Bit Comb.	Coarse Resolution State QA
15	Polar flag (latitude over 60 degrees (land) or 50 degrees (ocean))	1	yes
		0	no
14	Desert flag	1	yes
		0	no
13	RHO3 value is invalid	1	yes
		0	no
12	Channel 5 value is invalid	1	yes
		0	no
11	Channel 4 value is invalid	1	yes
		0	no
10	Channel 3 value is invalid	1	yes
		0	no
9	Channel 2 value is invalid	1	yes
		0	no
8	Channel 1 value is invalid	1	yes
		0	no
7	Channel 1 -5 are valid	1	yes
		0	no
6	Pixel is at night (high solar zenith)	1	yes
		0	no
5	Pixel is over dense dark vegetation	1	yes
		0	no
4	Pixel is over sunlight	1	yes
		0	no
3	Pixel is over water	1	yes
		0	no
2	Pixel contains cloud shadow	1	yes
		0	no
1	Pixel is cloudy	1	yes
		0	no
0	Pixel is partly cloudy	1	yes
		0	no

DATA REPROCESSING

a) Vegetation Indices

A new full record was generated. Using RED and NIR surface reflectance bands, NDVI and EVI2 SDS were estimated and added to this dataset.

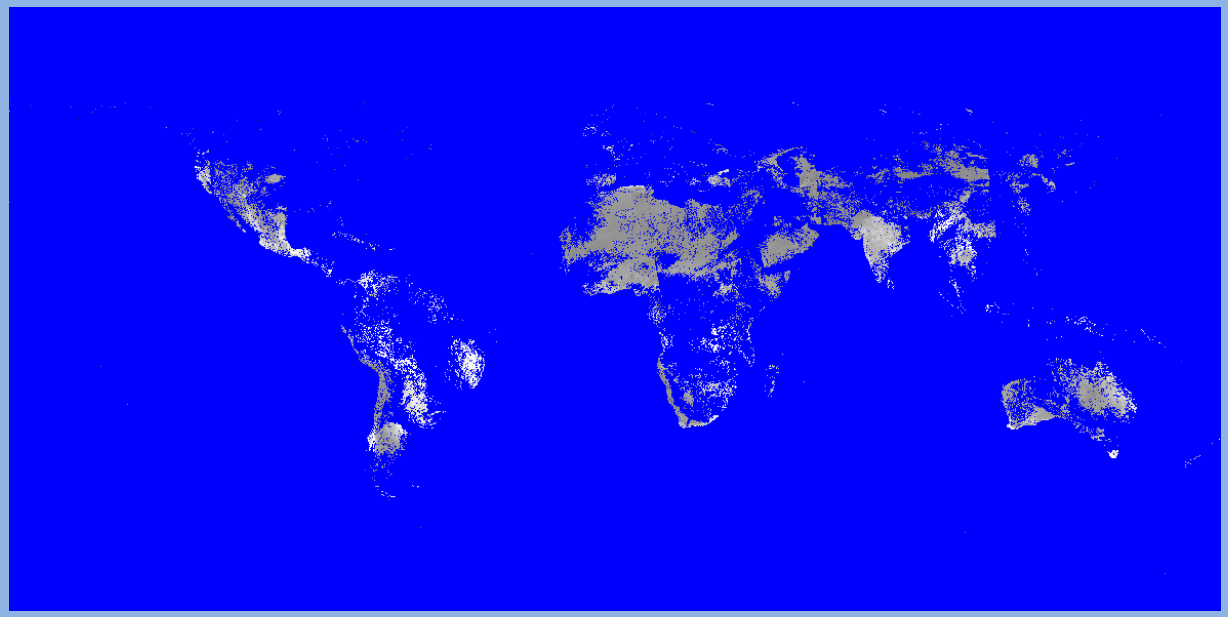
$$NDVI = \frac{(NIR - RED)}{(NIR + RED)}$$

$$EVI2 = 2.5\frac{(NIR - RED)}{(NIR + 2.4\,RED\ +\ 1)}$$

DATA REPROCESSING

b) Cloud Free Data

A new Cloud-free-data was generated. Using the information for the QA flags, clouds were removed from the VIS sds.



V3 advantages over V2

- Improved Calibration coefficients
- Improved geolocation accuracy
- New and improved cloud algorithm
- Corrected QA Flags
- BRDF correction applied

Known Issues

- The AVHRR instrument suffers from the lack of onboard calibration for its visible to short wave infrared channels.
- Detection of cloud shadow & dense vegetation may not be reliable
- CH3 reflectance is still experimental and not validated