

**GOES East GEOTIFF Products for GNC-A
South America, South and Central Americas and South
America and Africa (METEOSAT-10) Products
GNC-A Coordination Group Broadcast Committee
V1 - February 17, 2015**

INPE operationally ingests and distributes GOES images. In order to meet the requirement of GNC-A users, INPE generates GOES East image products in GEOTIFF format. The GOES East products covering South America in GEOTIFF include channel 1 (Visible), channel 3 (Water Vapor), and channel 4 (Infrared Radiation). For South and Central Americas and South America and Africa, images for the Infrared Channel are available.

1. The Pixel Value In GEOTIFF Image Products:

INPE stores the value of Albedo in visible GEOTIFF files and the value of Brightness Temperature in WV and IR GEOTIFF files. INPE reserves 2 bytes to store the pixel value in these GEOTIFF image products. The real pixel value is multiplied by the factor 100. For example, the value in GEOTIFF file will be 9725 if the real pixel value is 97.25.

Note that the value -32768 is used in non-image area of the visible imagery and the value -5452 is used in non-image are of both infrared and water vapor imagery.

2. The Coverage of GEOTIFF Image Products

The GEOTIFF image products from INPE cover South America (Visible, WV and IR), South and Central Americas (IR) and South Americas and Africa (IR). The Southern tip of South Americas and some of the oceanic areas are covered only in the Full Disk Routine (every three hours).

Note that Routine info can be found

at: <http://www.ospo.noaa.gov/Operations/GOES/east/imager-routine.html>

3. The Frequency of GEOTIFF Image Products:

Per the imaging schedule of GOES East satellite, INPE generates the South America image products every 30 minutes, South America and Africa products every 30 minutes and South and Central Americas every 3 hours.

4. The file name convention of GEOTIFF sector image products:

IMAGE PRODUCT	COVERAGE	NAME CONVENTION
GOES EAST	South America	INPE_SAV_YYYYMMDDHHMN.tif

VISIBLE		
GOES EAST WATER VAPOR	South America	INPE_SAW_YYYYMMDDHHMN.tif
GOES EAST IR	South America	INPE_SAI_YYYYMMDDHHMN.tif
GOES EAST IR	South and Central Americas	INPE_CSI_YYYYMMDDHHMN.tif
GOES EAST IR	South America and Africa (METEOSAT-10)	INPE_GMC_YYYYMMDDHHMN.tif

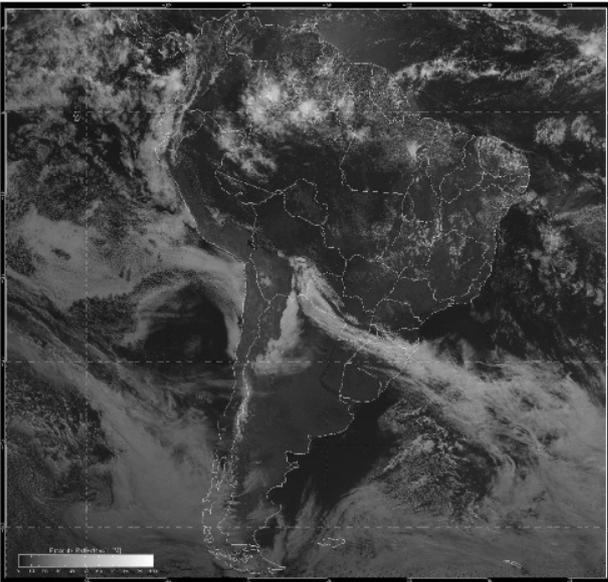
Please find below a detailed description of these products:

Category: Satellite Images

Product name: GOES-13 - Visible Channel - South America
 Provider: INPE - National Institute for Space Research (Brazil)

SDR ID#: 1

Formats: JPEG / GeoTIFF | Average Sizes: 570 KB / 1900 KB | Frequency: 30 minutes | Max n° of received files a day: 48
 GeoTIFF Pixel Info.: Albedo * 100 | Satellite: GOES-13 | Inst.: G-13 Imager | Chan.: 1 | Wl.: 0.52 to 0.71 µm, cent. at 0.63 µm
 Type: Image | Projection: Rectangular | Resolution: 4x4 km | Naming Convention: INPE_SAW_YYYYMMDDHHMN



- **General Description:**
 The visible channel is in the region of the electromagnetic spectrum where the sun emits most of its energy. That incoming energy is attenuated by molecules, clouds, and aerosols. About 50% of the incoming energy is either reflected or absorbed by the atmosphere and re-emitted to space. The remaining energy reaches the earth's surface where it is either absorbed or reflected.
- **Applications and Considerations:**
 - Clouds and earth surface detection
 - Soil, water and cloud type sensing
 - Haze, smoke, dust and fog monitoring
 - Estimation of cloud heights through shadows
 - Available daytime only
- **GEOSS Societal Benefit Areas:**
 Agriculture | Biodiversity | Climate | Disasters
 Ecosystems | Water | Weather

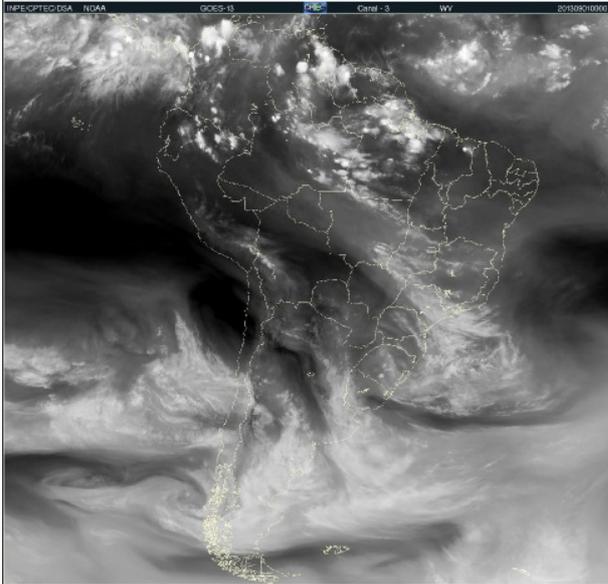
GEONETCast *Delivering Environmental Data to Users Worldwide*

Category: Satellite Images

Product name: **GOES-13 - Water Vapour Channel - South America** SDR ID#: **1**

Provider: INPE - National Institute for Space Research (Brazil)

Formats: JPEG / GeoTIFF | Average Sizes: 570 KB / 1900 KB | Frequency: 30 minutes | Max n° of received files a day: 48
GeoTIFF Info.: B. Temp. (K) * 100 | Satellite.: GOES-13 | Inst.: G-13 Imager | Chan.: 3 | Wl.: 5.77 to 7.33 μm , cent. at 6.5 μm
Type: Image | Projection: Rectangular | Resolution: 4x4 km | Naming Convention: INPE_SAW_YYYYMMDDHHMN



• General Description:

The infrared water vapour channel is located at 6.5 microns where the earth's emitted spectrum is highly attenuated by water molecules. Thus, this channel senses radiation from the mid- and upper-levels of the atmosphere, from both water vapour and clouds. Because water vapour is transported by atmospheric circulations, it allows the detection of features in the mesoscale flow as well as hemispheric patterns.

• Applications and Considerations:

- Very sensitive to atmospheric moisture
- Shows variations in upper tropospheric moisture
- Typically senses upper half of the troposphere
 - Senses higher altitudes in moist regions
 - Senses lower altitudes in dry regions
- Useful for inferring atmospheric motion
- Atmospheric wave structures are very apparent; short waves are readily seen
- Demonstrates limb darkening or cooling effect
- Jet streaks detection
- Ortopgraphically induced waves and associated clear-air turbulence detection
- Finer scale cloud structures detection
- Generation of water vapour motion winds

• GEOSS Societal Benefit Areas:

Agriculture | Climate | Ecosystems | Weather

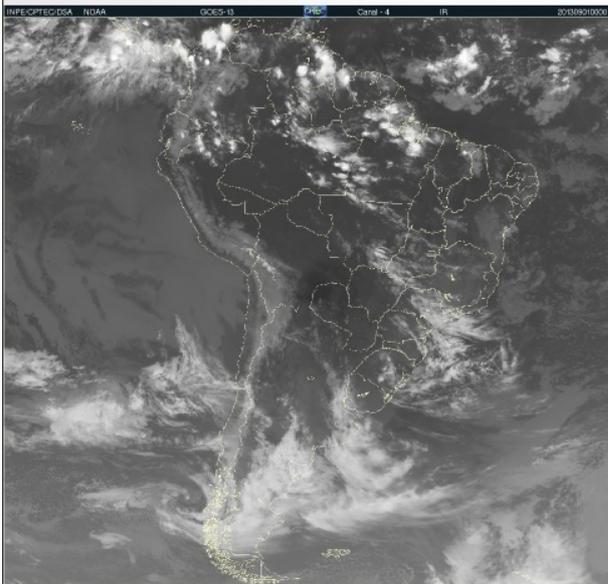


Category: Satellite Images

Product name: **GOES-13 - Infrared Channel - South America** SDR ID#: **1**

Provider: INPE - National Institute for Space Research (Brazil)

Formats: JPEG / GeoTIFF | Average Sizes: 570 KB / 1900 KB | Frequency: 30 minutes | Max n° of received files a day: 48
GeoTIFF Info.: B. Temp. (K) * 100 | Satellite.: GOES-13 | Inst.: G-13 Imager | Chan.: 4 | Wl.: 10.2 to 11.2 μm , cent. at 10.7 μm
Type: Image | Projection: Rectangular | Resolution: 4x4 km | Naming Convention: INPE_SAI_YYYYMMDDHHMN



• General Description:

The longwave infrared window channel covers a portion of the atmospheric infrared window. At this wavelength, energy radiated by the earth's surface and clouds is not significantly attenuated by atmospheric gases. In this channel most surfaces and cloud types have an emissivity close to 1, with a notable exception being thin cirrus. Therefore, the brightness temperature sensed by the satellite is close to actual surface skin or cloud top temperature for scenes other than cirrus.

• Applications and Considerations:

- Surface and cloud top temperature sensing
- Storm intensity and rainfall estimation
- Cloud features tracking over time to estimate atmospheric motion
- > Used in combination with the 12 μm channel (GOES 8-11/R):
 - Low-level moisture estimation, sea surface temperature, and volcanic ash detection
- > Used in combination with the 3.9 μm shortwave channel:
 - Cloud phase estimation, fog and snow stratus detection and water cloud vs. snow cover detection

• GEOS Societal Benefit Areas:

Agriculture | Climate | Ecosystems | Energy
Water | Weather



Category: Satellite Images

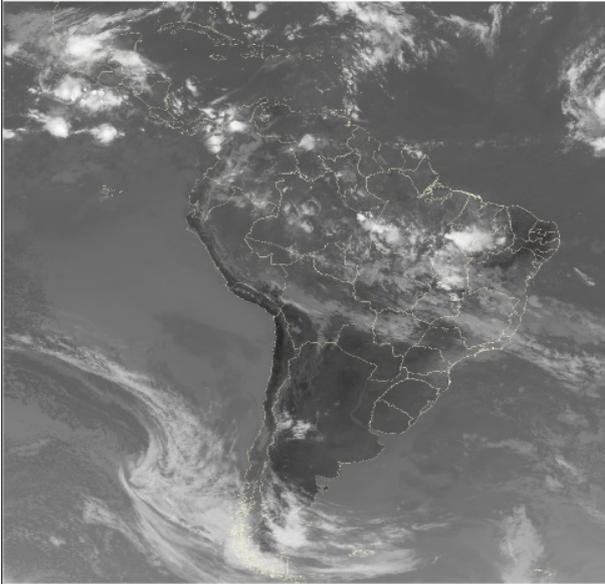
Product name: GOES-13 - Infrared Channel - Central and South America **SDR ID#: 4**

Provider: INPE - National Institute for Space Research (Brazil)

Formats: GeoTIFF | **Average Sizes:** 3750 KB | **Frequency:** 3 Hours | **Max n° of received files a day:** 8

GeoTIFF Info.: B. Temp. (K) * 100 | **Satellite:** GOES-13 | **Inst.:** G-13 Imager | **Chan.:** 4 | **Wl:** 10.2 to 11.2 µm, cent. at 10.7 µm

Type: Image | **Projection:** Rectangular | **Resolution:** 4x4 km | **Naming Convention:** INPE_CSI_YYYYMMDDHHMN



• General Description:

This product has the same information of the SAI product, with the addition of the Central America. It covers the follow spatial extent:

Latitude: 26° N to 56° S

Longitude: 104° W to 28° W

• Applications and Considerations:

- Surface and cloud top temperature sensing
- Storm intensity and rainfall estimation
- Cloud features tracking over time to estimate atmospheric motion
- › Used in combination with the 12 µm channel (GOES 8–11/R):
 - Low-level moisture estimation, sea surface temperature, and volcanic ash detection
- › Used in combination with the 3.9 µm shortwave channel:
 - Cloud phase estimation, fog and snow stratus detection and water cloud vs. snow cover detection

• GEOS Societal Benefit Areas:

Agriculture | Climate | Ecosystems | Energy
Water | Weather



Category: Satellite Images

Product name: GOES-13 + METEOSAT-10 - Infrared Channel - South America and Africa **SDR ID#: 1 / 5**

Provider: INPE - National Institute for Space Research (Brazil)

Formats: JPEG / GeoTIFF | **GeoTIFF:** Temp. (K) * 100 | **Av. Sizes:** 730 KB / 6.6 MB | **Freq.:** 30 min | **Max n° of files a day:** 48

Satellite 1: GOES-13 | **Instrument:** GOES-13 Imager | **Channel:** 4 | **Wavelength:** 10.2 to 11.2 µm, centered at 10.7 µm

Satellite 2: METEOSAT-10 | **Instrument:** SEVIRI | **Channel:** 9 | **Wavelength:** 9.80 to 11.80 µm, centered at 10.8 µm

Type: Image | **Projection:** Rectangular | **Resolution:** 4x4 km | **Naming Convention:** INPE_GMC_YYYYMMDDHHMN



• **GOES-13 Spatial Extent**
Latitude: 12.52° N to 56° S
Longitude: 100° W to 30° W

• **METEOSAT-10 Spatial Extent**
Latitude: 12.52° N to 56° S
Longitude: 30° W to 55° E

• **Total Spatial Extent**
Latitude: 12.52° N to 56° S
Longitude: 100° W to 55° E

• **Algorithm Methodology**
Both channels are interpolated to a regular grid of 4x4 km spatial resolution using the Nearest Neighbor Algorithm.

