Data User Guide

Infrared Global Geostationary Composite

Introduction

The Infrared Global Geostationary Composite dataset contains global composite images from the infrared channels of multiple weather satellites in geosynchronous orbit. These satellites include the Global Mobility Service (GMS) from Japan, Geostationary Operational Environmental Satellite (GOES) from the United States, NOAA satellites, and Meteorological Satellite (METEOSAT) from Europe spanning nearly the entire globe. The spatial resolution is 14 km before December 18, 2017 and 4 km thereafter with the data remapped into a Mercator projection. The data have not necessarily been cross calibrated between sensors. The data are available in AREA McIDAS format from June 4, 1995 to present.

Notice:

The composite global IR image is produced at the Aviation Weather Center (AWC) which is operated by the National Oceanic and Atmospheric Administration (NOAA). The data are ingested near real-time by the NASA Global Hydrology Resource Center (GHRC) DAAC and combined into a daily file for distribution.

Citation

Meyer, Paul. 1998. INFRARED GLOBAL GEOSTATIONARY COMPOSITE [indicate subset used]. Dataset available online from the NASA Global Hydrology Center DAAC, Huntsville, Alabama, U.S.A. DOI: http://dx.doi.org/10.5067/GHRC/MULTIPLE/DATA201

Keywords:

GHRC, NASA, Infrared, GMS-4, GOES-11, GOES-12, GOES-8, GOES-9, GOES-13, GOES-15, GOES-16, METEOSAT-6, METEOSAT-7, METEOSAT-8, METEOSAT-9, MTSAT-1R, NOAA-15, NOAA-16, NOAA-17, NOAA-18, AVHRR, GOES-11 IMAGER, GOES-12 IMAGER, GOES-8 IMAGER, GOES-9 IMAGER, VISSR, GOES-12 IMAGER

Mission

In accordance with the World Meteorological Organization (WMO) and the World Area Forecast System (WAFS) of the International Civil Aviation Organization (ICAO), high level

significant weather (SIGWX) forecasts are provided by the Aviation Weather Center (AWC) for the en-route portion of international flights. The AWC provides a suite of SIGWX forecast products for the World Area Forecast Center (WAFC) in Washington, D.C. These products are used directly by airline dispatchers for flight planning and weather briefing before departure, as well as by flight crew members during flight. These products are generated in sectors defined by the ICAO. As part of the preparation of these forecasts, the AWC forecasters utilize satellite image mosaics. The infrared satellite mosaics used by the AWC forecasters have been made into web displayable images. The projection and extent of the satellite images corresponds directly to the projections of the AWC high level SIGWX forecasts. The intent of these satellite images is to allow the users of the AWC international products to better utilize the forecast information through a shared situational awareness of the current conditions in different parts of the world. The satellite data contained in these images has the same values and time as other operational satellite web sites, such as National Environmental Satellite, Data, and Information Service (NESDIS), but these images have been remapped and combined into a mosaic to make their information content easier to relate to aviation forecast products.

Instrument Description

This Infrared Global Geostationary Composite dataset contains global composite images from the 11 micron channel of the geostationary and polar satellites from the GOES-east, GOES-west, GMS, Meteosat satellites, NOAA-15, NOAA-16, NOAA-17, and NOAA-18. The NOAA satellites are used to fill in data in the polar regions where the geostationary GOES satellites cannot reach. Areas where the GOES and the NOAA data overlap, the most timely satellite data are utilized for that region. The sectors containing data from the Meteosat satellites are restricted to 6 hour coverage by agreement with the original producers of those satellite data; therefore, all images across the mosaic are not in time sync. The satellites and bands currently used in the production of this product are listed in Table 1. Further information on weather satellites and available images can be obtained from NESDIS at http://www.goes.noaa.gov/.

Table 1: Satellite Data Used to Produce WORLD-IR Mosaic

Satellite	Years Operated
GOES-11	2000-2011
GOES-12	2001-2013
GOES-13	2006-2018
GOES-15	2010-present
GOES-16	2018-present
Meteosat-7	1998-2017
Meteosat-8	2002-present
Meteosat-9	2005-present
MTSAT-1R	2005-2015
NOAA-15	1998-present

NOAA-16	2000-2014
NOAA-17	2002-2013
NOAA-18	2005-present

*Note: Some of the earlier data holdings also include data from GOES-8, GOES-9, and Meteosat-6 satellites.

Investigators

Paul Meyer
NASA MSFC
Huntsville, Alabama

Data Characteristics

The Infrared Global Geostationary Composite data files are available in AREA McIDAS format at a level 3 data processing level. These data are at a Mercator projection and can be plotted using the Infrared Global Geostationary Composite Quick View Data Recipe. Daily granules are available, which contain global mosaics at half-hour intervals.

Table 2: Data Characteristics

Characteristic	Description
Platform	GMS-4, GOES-11, GOES-12, GOES-13, GOES-15, GOES-16, GOES-8, GOES-9, METEOSAT-6, METEOSAT-7, METEOSAT-8, METEOSAT-9, MTSAT-1R, NOAA-15, NOAA-16, NOAA-17, NOAA-18
Instrument	AVHRR, GOES-11 IMAGER, GOES-12 IMAGER, GOES-13 IMAGER, GOES-15 IMAGER, GOES-8 IMAGER, GOES-9 IMAGER, VISSR, GOES-16 IMAGER
Projection	Mercator
Spatial Coverage	N: 66.0, S: -61.0, E: 180.0, W: -180.0 (Global)
Spatial Resolution	4 km
Temporal Coverage	June 4, 1995 - present
Temporal Resolution	daily
Sampling Frequency	30 minutes
Parameter	Infrared wavelengths
Version	1
Processing Level	3

File Naming Convention

The Infrared Global Geostationary Composite dataset has the file naming convention shown below. These data files are available in AREA McIDAS format.

Data files: globir.yyddd.hhmm

Table 3: File naming convention variables

Variable	Description
yy	Two-digit year
ddd	Three-digit day of year (Julian day)
hh	Hour of data
mm	Minute of data

Data Format and Parameters

The Infrared Global Geostationary Composite dataset consists of AREA McIDAS data files. This allows for navigation and temperature calibration of the data; however, the data have not necessarily been cross-calibrated between sensors. Each file contains one day's data which consists of 48 images collected from multiple platforms and instruments listed in Table 2. These data are in a Mercator projection with a spatial resolution of 14 km before December 18, 2017 and 4 km thereafter. Daily files contain global mosaics at half-hour intervals.

The infrared channel shows the temperature of the clouds. The higher clouds are colder and show up as white. Where there are no clouds the satellite shows the ground temperature with black being relatively warmer.

The original global datasets at the AWC are used to generate the International Satellite Products, as well as used by the forecasters in the generation of the international AWC products. The composite global IR image is produced at the AWC which is operated by the National Oceanic and Atmospheric Administration. The data are ingested near real-time by the NASA Global Hydrology Resource Center (GHRC) DAAC and combined into a daily file for distribution.

Quality Assessment

These data are not intercalibrated before merging; therefore, there may be difference across boundaries in the product. Be aware that the resolution of the data product changed from 14 km to 4 km as of December 18, 2018 14:15 UTC.

Software

The Infrared Global Geostationary Composite data files are available in AREA McIDAS format and can be plotted using the Infrared Global Geostationary Composite Quick View Data Recipe.

References

Kidder, S. Q. and T. H. Vonder Haar, Satellite Meteorology An Introduction , Academic Press, San Diego, CA, 1995.

Related Data

All data from the instruments used as input to create this dataset are considered related to this data. Other data using AVHRR, GOES-11 IMAGER, GOES-12 IMAGER, GOES-13 IMAGER, GOES-15 IMAGER, GOES-8 IMAGER, GOES-9 IMAGER, VISSR, GOES-16 IMAGER, or other instruments from GMS-4, GOES-11, GOES-12, GOES-13, GOES-15, GOES-16, GOES-8, GOES-9, METEOSAT-6, METEOSAT-7, METEOSAT-8, METEOSAT-9, MTSAT-1R, NOAA-15, NOAA-16, NOAA-17, NOAA-18 can be located using the GHRC HyDRO 2.0 search tool.

Contact Information

To order these data or for further information, please contact:

NASA Global Hydrology Resource Center DAAC
User Services
320 Sparkman Drive
Huntsville, AL 35805
Phone: 256-961-7932
E-mail: support-ghrc@earthdata.nasa.gov
Web: https://ghrc.nsstc.nasa.gov/

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