Data User Guide

GPM Ground Validation GOES 15 Visible and Infrared Images OLYMPEX

Introduction

The GPM Ground Validation GOES 15 Visible and Infrared Images OLYMPEX dataset contains visible and infrared images from the GOES 15 Imager during the GPM Ground Validation Olympic Mountains Experiment (OLYMPEX) field campaign held in the Pacific Northwest. The GOES 15 images are available for all dates between November 5, 2015 and May 1, 2016 at 15 minute intervals. The GPM Ground Validation GOES 15 OLYMPEX dataset files are available in PNG format.

Citation

National Weather Service. 2018. GPM Ground Validation GOES 15 Visible and Infrared Images OLYMPEX [indicate subset used]. Dataset available online from the NASA EOSDIS Global Hydrology Resource Center Distributed Active Archive Center, Huntsville, Alabama, U.S.A. doi: http://dx.doi.org/10.5067/GPMGV/OLYMPEX/GOES15/DATA101

Keywords:

NOAA, GHRC, GPM, OLYMPEX, Washington, GOES 15, Imager, Infrared, Visible

Campaign

The Global Precipitation Measurement (GPM) mission Ground Validation campaign used a variety of methods for validation of GPM satellite constellation measurements prior to and after launch of the GPM Core Satellite, which launched on February 27, 2014. The instrument validation effort included numerous GPM-specific and joint agency/international external field campaigns, using state of the art cloud and precipitation observational infrastructure (polarimetric radars, profilers, rain gauges, and disdrometers). Surface rainfall was measured by very dense rain gauge and disdrometer networks at various field campaign sites. These field campaigns accounted for the majority

of the effort and resources expended by GPM GV. More information about the GPM mission is available at https://pmm.nasa.gov/GPM/.

One of the GPM Ground Validation field campaigns was the Olympic Mountains Experiment (OLYMPEX) which was held in the Pacific Northwest (Houze et al., 2017). The goal of OLYMPEX was to validate rain and snow measurements in mid-latitude frontal systems as they move from ocean to coast to mountains and to determine how remotely sensed measurements of precipitation by GPM can be applied to a range of hydrologic, weather forecasting, and climate data. The campaign consisted of a wide variety of ground instrumentation, radars, and airborne instrumentation monitoring oceanic storm systems as they approached and traversed the Peninsula and the Olympic Mountains. The OLYMPEX campaign was part of the development, evaluation, and improvement of GPM remote sensing precipitation algorithms. More information is available from the NASA GPM Ground Validation web site https://pmm.nasa.gov/olympex, and the University of Washington OLYMPEX web site http://olympex.atmos.washington.edu/. The GPM Ground Validation OLYMPEX Field Campaign Data Collection are available at GHRC (doi: http://dx.doi.org/10.5067/GPMGV/OLYMPEX/DATA101).

Figure 1: OLYMPEX Domain
(Image Source: https://pmm.nasa.gov/OLYMPEX)

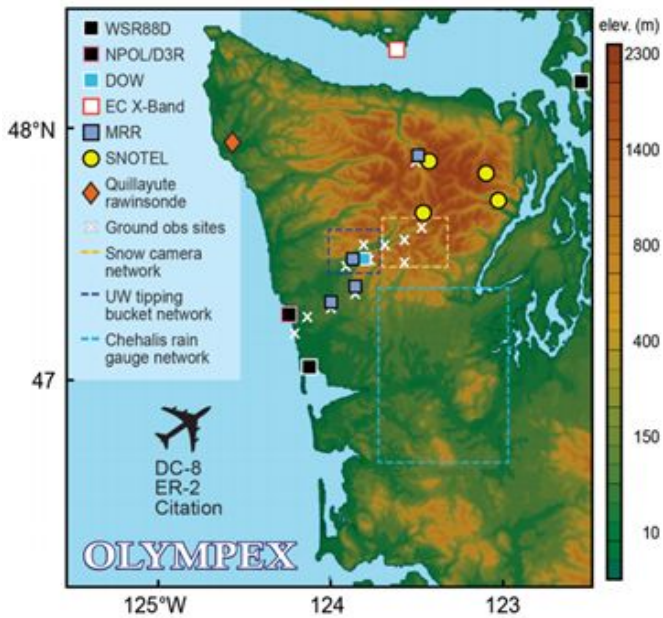

Figure 2: OLYMPEX Field Locations.
(Image Source: https://pmm.nasa.gov/OLYMPEX)

Instrument Description

The Geostationary Operational Environmental Satellite (GOES) 15 satellite is the 15th in a series of U.S. satellites in geostationary orbit over the equator in an Earth synchronous orbit. Launched on March 4, 2010, GOES 15 is part of the GOES N-Series (including GOES 13 through 15). GOES 15 was placed in orbit originally as a spare, but on December 6, 2011, GOES 15 was positioned in GOES West satellite location at 135 degrees west longitude, replacing GOES 11. GOES 15 hosts an imager, sounder, the Solar X-ray Imager (SXI), the Space Environment Monitor System (SEM), and a search and rescue transponder which relays distress signals to the ground. The GOES 15 Imager is a five channel (one visible, four infrared) imaging radiometer designed to sense radiant and solar reflected energy from sampled areas of the Earth. The GOES West location allowed for views of the OLYMPEX field campaign region during the Nov 2015 to May 2016 time period.

Investigators

National Weather Service
National Oceanic and Atmospheric Administration
Silver Spring, MD

Data Characteristics

The GPM Ground Validation GOES 15 Visible and Infrared Images OLYMPEX dataset consists of files in PNG format at Level 1B processing level. More information about the NASA data processing levels are available on the NASA Data Processing Levels website.

This GOES 15 imager dataset contains visible (VIS) and infrared (IR) images covering the continental United States (CONUS) for all dates between November 5, 2015 and May 1, 2016 at 15-minute intervals. Table 1 provides the characteristics of the GOES 15 dataset.

Table 1: GOES 15 Imager dataset Data Characteristics

Characteristic	Description
Platform	GOES 15
Instrument	GOES 15 Imager
Projection	n/a
Spatial Coverage	N: 53.0, S: 23.0, E: -62.0, W: -132.0
Spatial Resolution	1 km for VIS, 4 km for IR
Temporal Coverage	November 5, 2015 to May 1, 2016
Temporal Resolution	15 minutes
Sampling Frequency	<1 second
Parameter	Infrared wavelengths, visible wavelengths
Version	1
Processing Level	Level 1B

File Naming Convention

The GPM Ground Validation GOES 15 Visible and Infrared Images IPHEx datasets include visible and infrared images in PNG format obtained from NOAA. The files are named using the following convention:

Browse files: olympex_<YYYY-MM-DD>_<hh-mm-ss>_GE_GOES-15_<***>_CONUS.png

Table 2: GOES 15 file naming convention variables

Variable	Description
YYYY-MM-DD	YYYY: 4-digit year MM: 2-digit month DD: 2-digit day
hh-mm-ss	hh: 2-digit hour mm: 2-digit minute ss: 2-digit second
***	Channel (IR3, IR4, or VIS) IR3: moisture infrared (5.80-7.30 µm) IR4: thermal infrared (10.2-11.2 µm) VIS: visible (0.55-0.75 µm)
png	Portable Network Graphics format

Data Format and Parameters

The GPM Ground Validation GOES 15 Visible and Infrared Images OLYMPEX dataset files are available in PNG format and contain visible and infrared band images over the OLYMPEX campaign areas.

Known Issues or Missing Data

There are no known issues with these data or any known gaps in the dataset.

References

GOES 15. NASA website:
https://nssdc.gsfc.nasa.gov/nmc/spacecraftDisplay.do?id=2010-008A

GOES-N Series. NASA website:
http://www.nasa.gov/mission_pages/goes-n/index.html#.VOymYvnF8n0

Houze, R. A., L. A. McMurdie, W. A. Petersen, M. R. Schwaller, et al. (2017): The Olympic Mountains Experiment (OLYMPEX). *Bull. Amer. Meteor. Soc.*, 98, 2167-2188. doi: https://doi.org/10.1175/BAMS-D-16-0182.1

Related Data

All datasets from OLYMPEX can be considered related to this dataset. Other OLYMPEX campaign data can be located using the GHRC HyDRO 2.0 search tool, by entering the term 'OLYMPEX'.

Contact Information

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

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