



NASA Langley Satellite Products and Archive Update

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NASA LANGLEY CLOUD AND RADIATION GROUP



HAIC-HIWC Science Team Meeting

16-19 May, 2016

Toronto, Canada

NASA LaRC Clouds & Radiation Group Web Page

- <http://www-pm.larc.nasa.gov/>
 - Full disk products for Meteosat, MTSAT, Himawari, GOES
 - Real-time hourly imagery (.gif files) and products (netCDF)
 - 8-km spatial resolution, hourly
 - Field experiment pages located on left side
 - Highest available temporal and spatial resolution
 - 4-km spatial res for Darwin and Cayenne
 - 1-km visible imagery available
 - Overshooting Top (OT) Database
 - Important for HIWC diagnostic method
 - More detail at tomorrow's research update

NASA LANGLEY CLOUD AND RADIATION RESEARCH
(Minnis Group)

Satellite Imagery And Cloud Products Page

Real-time and Historical Cloud Product Loops: The cloud products are derived with VISST/SIST algorithm. Select a domain from the table below to access the real-time (blue cells) and archived products.

FULL-DISK CLOUD PRODUCTS (Real Time)					
GOES-WEST	GOES-EAST	METEOSAT	INSAT	HIMAWARI-8	MTSAT
New!! Merged Global Geostationary Gridded Cloud Products New!!					

Cloud Products

GOES WEST	GOES EAST	METEOSAT	TWP DOMAIN	AVHRR/MODIS
North America (RR)		AMF-Azores	MTSAT	ARM-SGP
West CONUS	East CONUS	HIWC-Cayenne	MANUS	Alaska (Direct Broadcast)
MERGED CONUS		WEST EUROPE	AMIE (MTSAT and FENG-YUN)	Alaska (Relay)
ARM-SGP	ARM-SGP	EUROPE	HIWC	ARM-NSA
Alaska/NPacific	HIWC-2015-Puerto-Rico	ARM-NIAMEY	GOES-9	COVE
	HIWC-Cayenne		NAURU	
			DARWIN	

Real-time and Historical Satellite Imagery Loops: The links from the table below provide access to the real-time (blue cells) and historical image loops for various satellites.

SATELLITE IMAGERY				
N. America GOES-W	N. America GOES-E	Mid-Atlantic US	Southeast US	CONUS
E. Pacific GOES-E	SGP 1KM VIS GOES-E	TWP DARWIN MTSAT	TWP DARWIN FY2C	TWP DARWIN MTSAT & FY2C
CALWater-2/ACAPEX	Florida		GMS-5 TWP	PACS EPIC
Mid-West US (SGP)	Northeast US			
	PacificWest			

Full-Disk Satellite Imagery

GOES-W FD	GOES-E FD	MET-0/E FD	MET-7/5/E FD	HIMAWARI-8
		FY2D/86E FD	FY2C.E/105E FD	MTSAT FD

Composite Satellite Imagery

Alaska MODIS	Global Geostationary	North Pole MODIS	South Pole MODIS

Cloud Products derived at Ground Sites

- VISST - Computed from pixel retrievals inside a 10 km or 20 km radius centered on the site.
 - + Real Time Sites:
 - McMurdo - TERRA | McMurdo - AQUA | NASA Glenn | GOES-W SGP | GOES-E SGP | TWP Nauru | TWP Manus | TWP Darwin | SIRTA France | Chilbolton U.K | Cabauw Netherlands | Lindenberg Germany | Potenza Italy | Atkasuk | Barrow | Oliktok | Toolik | COVE | Niamey Nigeria | COPS |
 - + Past IOP Sites:
 - Pi Revas | CRYSTAL-FACE | ATReC Bangor | ATReC Montreal |
- LBTM - Computed from 3x3 1/3 ° regions centered on the site.
 - SGP CART | TWP Nauru | TWP Manus | TWP Darwin |

LaRC-supported field experiments

HAIC-HIWC Cayenne

HAIC-HIWC Darwin

Field Experiments:


HIWC-2015 Cayenne

HIWC-DARWIN

HAIC-HIWC Cayenne Web Page

- GOES-13 & Meteosat-10 imagery, cloud product imagery, flight track imagery
- Updates since fall 2015 meeting in Melbourne
 - **New flight track imagery with all aircraft on a single image**
 - See all flight paths “at a glance”
 - Easier to view aircraft coordination
 - Single-aircraft imagery still available
 - Available on NCAR field catalog, will be loaded LaRC page too
 - Cloud products extracted along aircraft track

aircraft track overlays on GOES-13 VIS and IR imagery



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Search:

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High Ice Water Content (HIWC) - 2015 Cayenne Campaign

+ High Ice Water Content (HIWC) Research Official Home

Cloud Products

- + GOES-13 8km
- + GOES-13 (Small)
- + MSG (Small)
- + Dual-Satellite IWC
- + G13 OT/HIWC probability
- + MSG OT/HIWC probability

Satellite Imagery

- + GOES-13 (Large)
- + GOES-13 (Small)
- + MSG (Large)
- + MSG (Small)

Flight Track Overlay

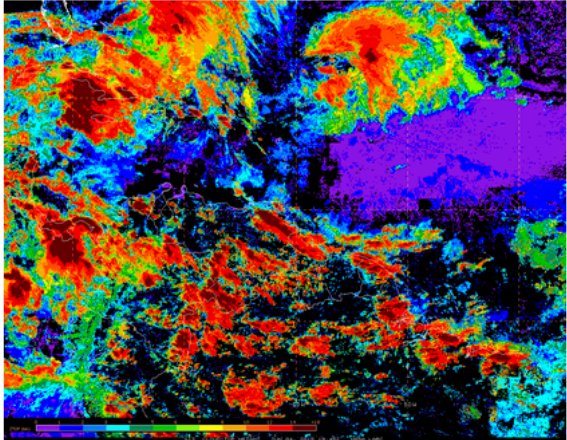
- + Falcon 20
- + Convair
- + Boeing
- + All Planes Overlay

Cloud Products Along Track

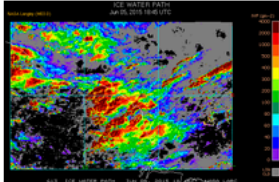
Langley Satellite Support for High Ice Water Content (HIWC) 2015 Cayenne Campaign

Latest Satellite Imagery & Products for HIWC-2015 Field Experiment

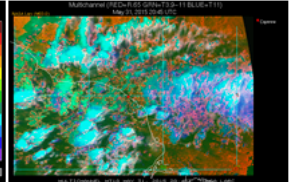
Puerto Rico Cloud Products (larger domain)



GOES-13 Cloud Product (large)



GOES-13 Cayenne Cloud Product (small)



MSG Cayenne Cloud Product (small)

Quick Links

Cloud Products

- + Cld Top Height
- + Cld Bot Height
- + RGB
- + ICING
- + DEFF
- + REFF
- + TAU
- + IWP
- + LWP

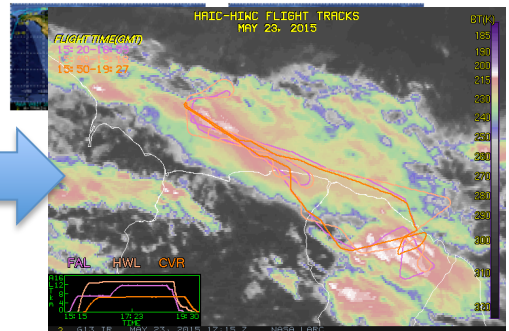
Archive

- + GOES-13 Cloud Products
- + MSG Cloud Products

Satellite Imagery

- + G13/MSG C01
- + G13:C03, MSG:C05
- + G13:C04, MSG:C09
- + G13:C4RC, MSG:C9RC

Current Location of A-Train Satellites (updated every 30 sec)













Flight Tracks on VIS & IR Imagery

- All-plane flight track summary images for Cayenne
 - Falcon, Convair, and Honeywell flight tracks overlaid on GOES-13 Vis and IR imagery
- Imagery delivered to NCAR field catalog
 - http://catalog.eol.ucar.edu/haic-hiwc_2015
 - Click on “Missions” in the toolbar
 - Imagery located under “Sat/Flight Track Plots”
 - Aircraft color-code and altitude shown in inset time series plot



HAIC-HIWC Field Catalog

Cayenne Campaign: 2015

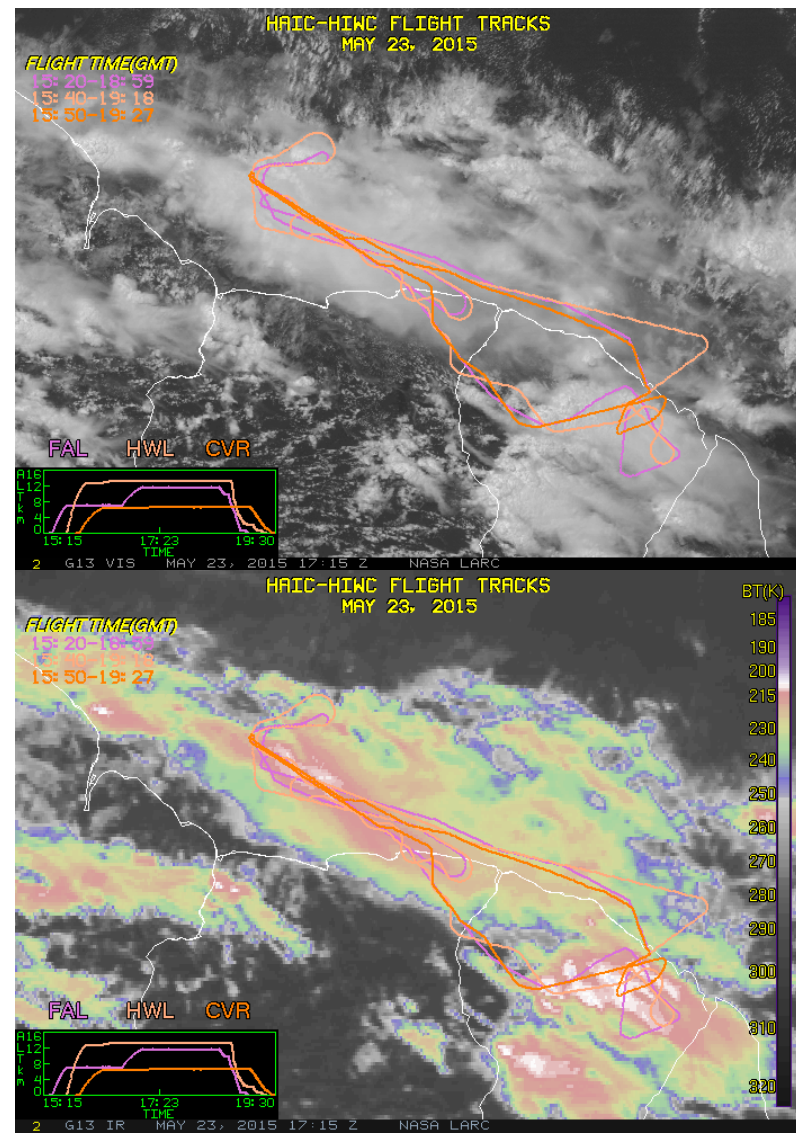


[Home](#) [Maps](#) [Reports](#) [Status](#) [Products](#) [Missions](#) [Tools & Links](#) [Help](#)

HAIC-HIWC Cayenne

Flight	Takeoff Date/Time	Landing Date/Time	Weather Conditions	Catalog Products	Sat/Flight Track Plots	Radar TA Plots	Chat Logs	Summaries	Notes
Falcon F11	2015-05-12 20:00	2015-05-12 22:30	Land-based convection over Suriname	Satellite Radar Lightning Analysis Aircraft Surface Upperair Model	IR Overlay Vis Overlay	Reactivity IW			
Falcon F12 Convair F09	2015-05-14 13:30	2015-05-14 17:00	Oceanic convection near French Guiana coast - coordinated sampling	Satellite Radar Lightning Analysis Aircraft Surface Upperair Model	IR Overlay Vis Overlay	Reactivity IW	PLANET EOL	Missing	N/A
Falcon F13 Convair F10	2015-05-15 08:30	2015-05-15 12:40	Oceanic convection East of French Guiana - coordinated sampling	Satellite Radar Lightning Analysis Aircraft Surface Upperair Model	IR Overlay Vis Overlay	Reactivity IW	PLANET EOL	Missing	N/A
Falcon F14 Convair F11 Honeywell F309	2015-05-16 08:30	2015-05-16 12:40	Oceanic convection East of French Guiana - coordinated sampling	Satellite Radar Lightning Analysis Aircraft Surface Upperair Model	IR Overlay Vis Overlay	Reactivity IW	PLANET EOL	Missing	N/A
Falcon F15 Convair F12	2015-05-16 15:30	2015-05-16 18:40	Cloudsat overpass - land based convection over French Guiana	Satellite Radar Lightning Analysis Aircraft Surface Upperair Model	IR Overlay Vis Overlay	Reactivity IW	PLANET EOL	Missing	N/A

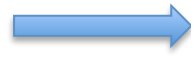
catalog.eol.ucar.edu/haic-hiwc_2015/tools/missions




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 - **Cloud products extracted along aircraft track**
 - Plotting tools to display data

cloud products along aircraft track





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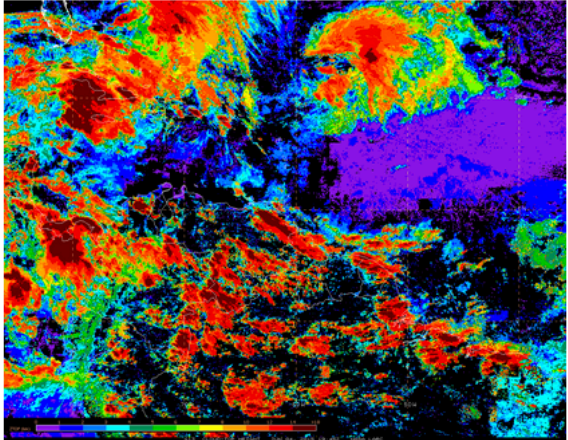
High Ice Water Content (HIWC) - 2015 Cayenne Campaign

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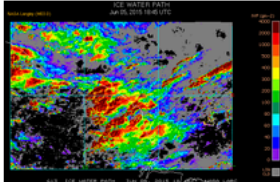
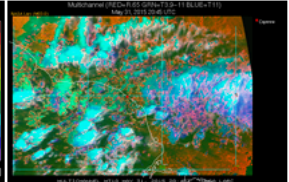
Langley Satellite Support for High Ice Water Content (HIWC) 2015 Cayenne Campaign

Latest Satellite Imagery & Products for HIWC-2015 Field Experiment

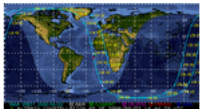
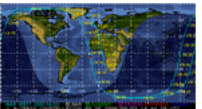
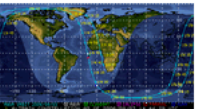
Puerto Rico Cloud Products (larger domain)



GOES-13 Cloud Product (large)

Current Location of A-Train Satellites (updated every 30 sec)

Quick Links

Cloud Products

- + Cld Top Height
- + Cld Bot Height
- + RGB
- + ICING
- + DEFF
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- + IWP
- + LWP

Archive

- + GOES-13 Cloud Products
- + MSG Cloud Products

Satellite Imagery

- + G13/MSG C01
- + G13:C03, MSG:C05
- + G13:C04, MSG:C09
- + G13:C4RC, MSG:C9RC

Cloud Products

- + GOES-13 8km
- + GOES-13 (Small)
- + MSG (Small)
- + Dual-Satellite IWC
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Satellite Imagery

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- + GOES-13 (Small)
- + MSG (Large)
- + MSG (Small)

Flight Track Overlay

- + Falcon 20
- + Convair
- + Boeing
- + All Planes Overlay

Cloud Products Along Track

- + Cloud Products Plotter

Downloads

- + HIWC 2015 KML Files
- + GOES-13 Cayenne
- + MSG Cayenne
- + Raw Data

Related Datasets

- + HIWC-2014 Darwin
- + HIWC-2015 Florida

Viewers / Tools

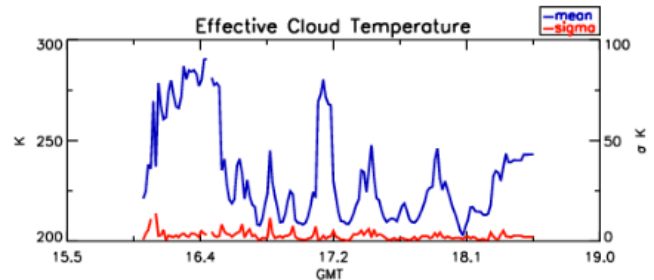
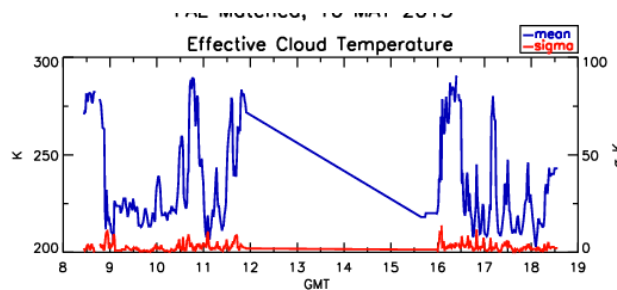
- + Satellite Prediction Tool

HAIC-HIWC Cayenne Along-Track Cloud Products

- Tool available to display time series of various cloud products matched to aircraft track
- Meteosat-10 products now available for Falcon
- Met-10 cloud products along Convair & Honeywell flight tracks to follow

Select up to 4 products from the drop-down menu

Select flight day, select time range (useful for days with two flights)



HAIC-HIWC Cayenne Along-Track Cloud Products

- Time series plots display **mean** (4 pixels) and **standard deviation** (9 pixels)
- View/Obtain Data
 - Display plotted values to the screen
 - Download plots
 - Download ASCII file containing all products or just the parameters you select
- ASCII files include aircraft location, i.e., lat/lon coordinates, for use with your own plotting tools

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NASA Fact

The term "aeronautics" originated in France, and was derived from the Greek words for "air" and "to sail."

+ More NASA facts...

Field Experiment System

ASCII File • Plot • Full Data File

Results:

NASA–Langley MET10V VISST Derived Cloud Products
FAL Matched, 16 MAY 2015

Temperature 10.8 μ m

Cloud Top Height

Ice Water Path

Y-axis: μ (0 to 300), σ K (0 to 100)

Y-axis: km-msl (0 to 16), σ km-msl (0 to 16)

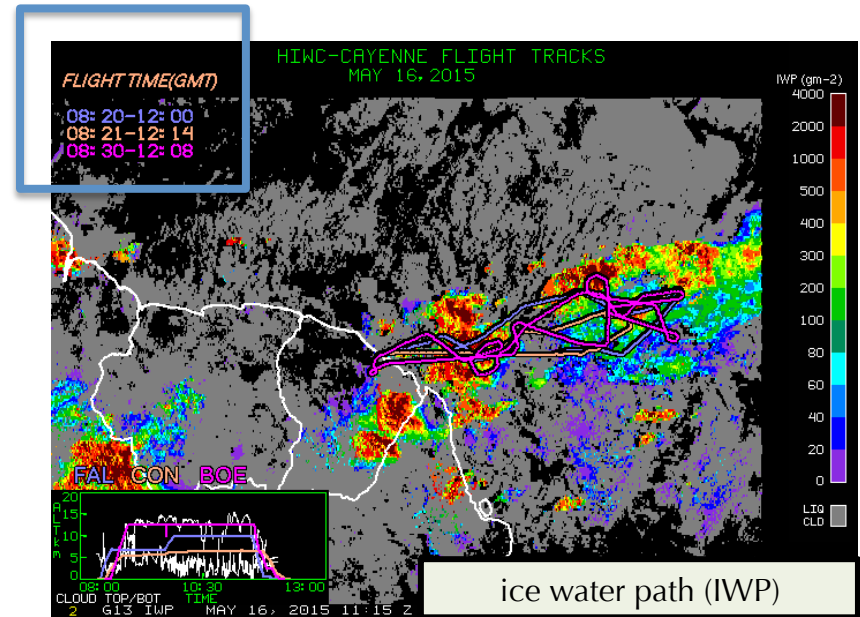
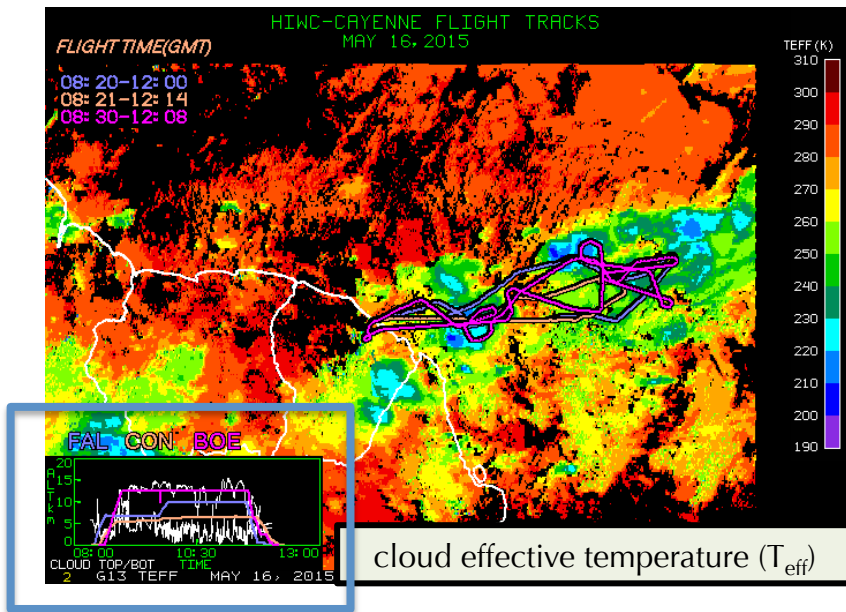
Y-axis: $g\ m^{-3}$ (0 to 3800)

X-axis: GMT (15.5 to 19.0)

Flight Tracks on Cloud Product Imagery

- Flight track overlay for Cayenne on cloud product imagery in addition to VIS/IR imagery
 - Falcon, Convair, and Honeywell flight tracks overlaid on GOES-13 cloud product imagery
 - Images not yet loaded to web page

flight start and end times,
color-coded to aircraft



Summary

- No updates to cloud retrieval products since Melbourne meeting
- New flight track overlays on VIS/IR imagery available for Cayenne
 - All-aircraft overlays on VIS or IR images, delivered to NCAR field catalog
 - All-aircraft overlays on GOES-13 cloud product fields (e.g., cloud temperature, ice water path) will be available soon
- Meteosat-10 products extracted along Falcon flight track for HAIC-HIWC Cayenne flights
 - Plotting tools and ASCII files now available on web page
 - Along-track products for Convair and Honeywell to follow
 - Preferences for priority? GOES-13 vs MSG? Convair vs Honeywell?
- Latest OT database will be available on LaRC archive and/or NCAR EOL archive