

# NASA Langley Satellite Product Archive Darwin 2014

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# Satellite Data Archive

- Darwin: MTSAT-1R, MTSAT-2
  - Every 10min (Mtsat-1), hourly (Mtsat2)
  - 5 channel: 0.75um, 3.75um, 6.75um, 10.8um, 12um
- Cayenne: MSG (15min), GOES-East (30min)

Format:

- Satellite Data: McIDAS Areafiles and GIF
- Cloud Products: NetCDF, GIF, and ASCII





- + NASA Home
- + NASA LaRC Home
- + Science Directorate
- + Minnis Group Home

### High Ice Water Content (HIWC)

+ High Ice Water Content (HIWC) Research Official Home

#### Cloud Products

- + Darwin MT2
- + RapidScan MTSAT-1R
- + GOES-13
- + GOES-13 Cayenne

#### Satellite Imagery

- + G13 Costa Rica
- + Darwin MTS1
- + GOES-13
- + GOES-13 Cayenne
- + MSG Cayenne

#### Flight Track Overlay

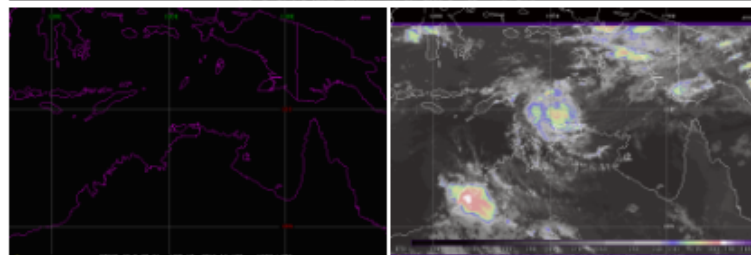
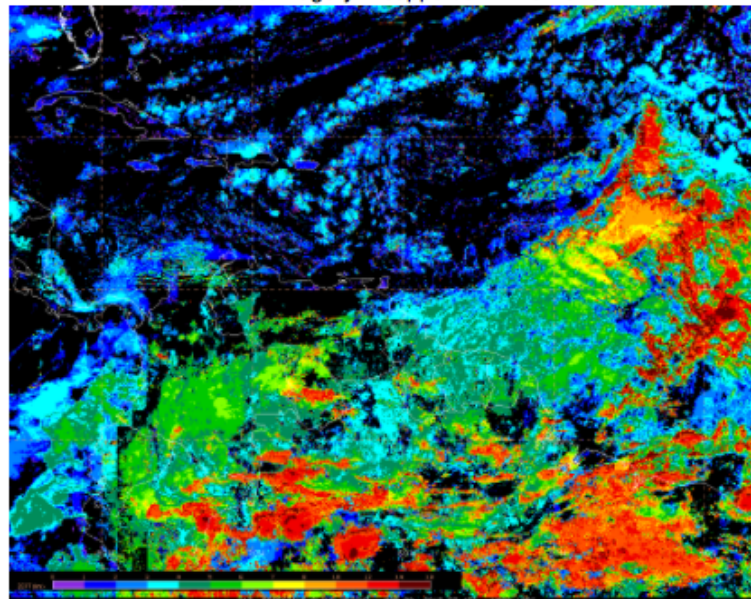
- + Falcon - Sat Imagery
- + Falcon - Product Imagery

#### Cloud Products Along Track

- + Falcon

### Langley Satellite Support for High Ice Water Content (HIWC) Research

Latest Satellite Imagery & Products for HIWC field experiment  
GOES-13 Imagery in support of HIWC-2015



MTSAT-2 Cloud Products  
(larger domain)



#### Quick Links

##### Satellite Imagery

- + C01, C2RC
- + C02, C04

##### Cloud Products

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

##### Archive

- + MTSAT-2R Cloud Products
- + MTSAT-1R Cloud Products

# Satellite Cloud Products

- + NASA Home
- + NASA LaRC Home
- + Science Directorate
- + Minnis Group Home

## High Ice Water Content (HIWC)

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- + Falcon - Product Imagery

The screenshot shows the NASA HIWC website interface. At the top, there is a NASA logo and the text 'NATIONAL AERONAUTICS AND SPACE ADMINISTRATION'. A search bar is located on the right. Below the header, there are navigation tabs: Home, Cloud Products, Satellite Imagery, Field Experiments, References, and Options. The main content area is titled 'HIWC Home Page' and includes filters for Domain (HIWC MTSAT Cloud Products), Date (2014-04-02), Image (Effective Cloud Temperature), Satellite (MTSAT-2), Image Time (16:32 UTC), and Animate (Frames ---). A large satellite image of 'EFFECTIVE CLOUD TEMPERATURE' is displayed, with a color scale at the bottom ranging from 190 K to 310 K. A green arrow points from the 'Cloud Products' menu item to the main content area.

**0.65, 1.6  $\mu\text{m}$  Reflectances**

**3.7, 6.7, 10.8  $\mu\text{m}$  Temp**

**12 or 13.3  $\mu\text{m}$  Temp**

**Broadband TOA Albedo**

**Broadband OLR**

**Clear-sky Skin Temperature**

**Icing Potential\*\***

**Pixel Lat, Lon**

**Pixel SZA, VZA, RAZ**

**Cloud**

**Overshooting tops**

**HIWC Probability \*new**

**Mask, Phase**

**Optical Depth, IR emissivity**

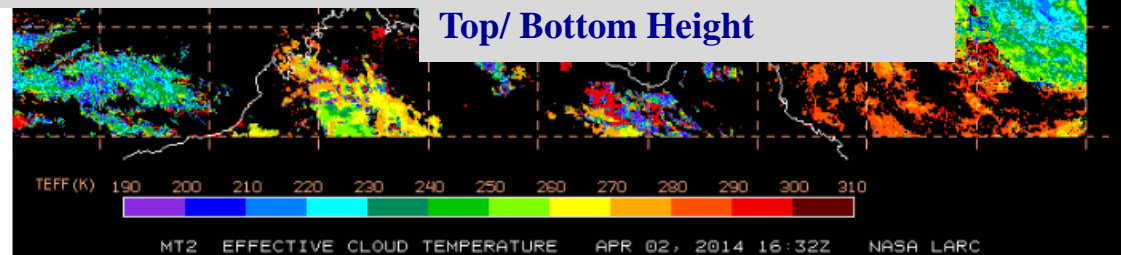
**Cloud effective particle size**

**Liquid/Ice Water Path**

**Effective Temp, hgt, pressure**

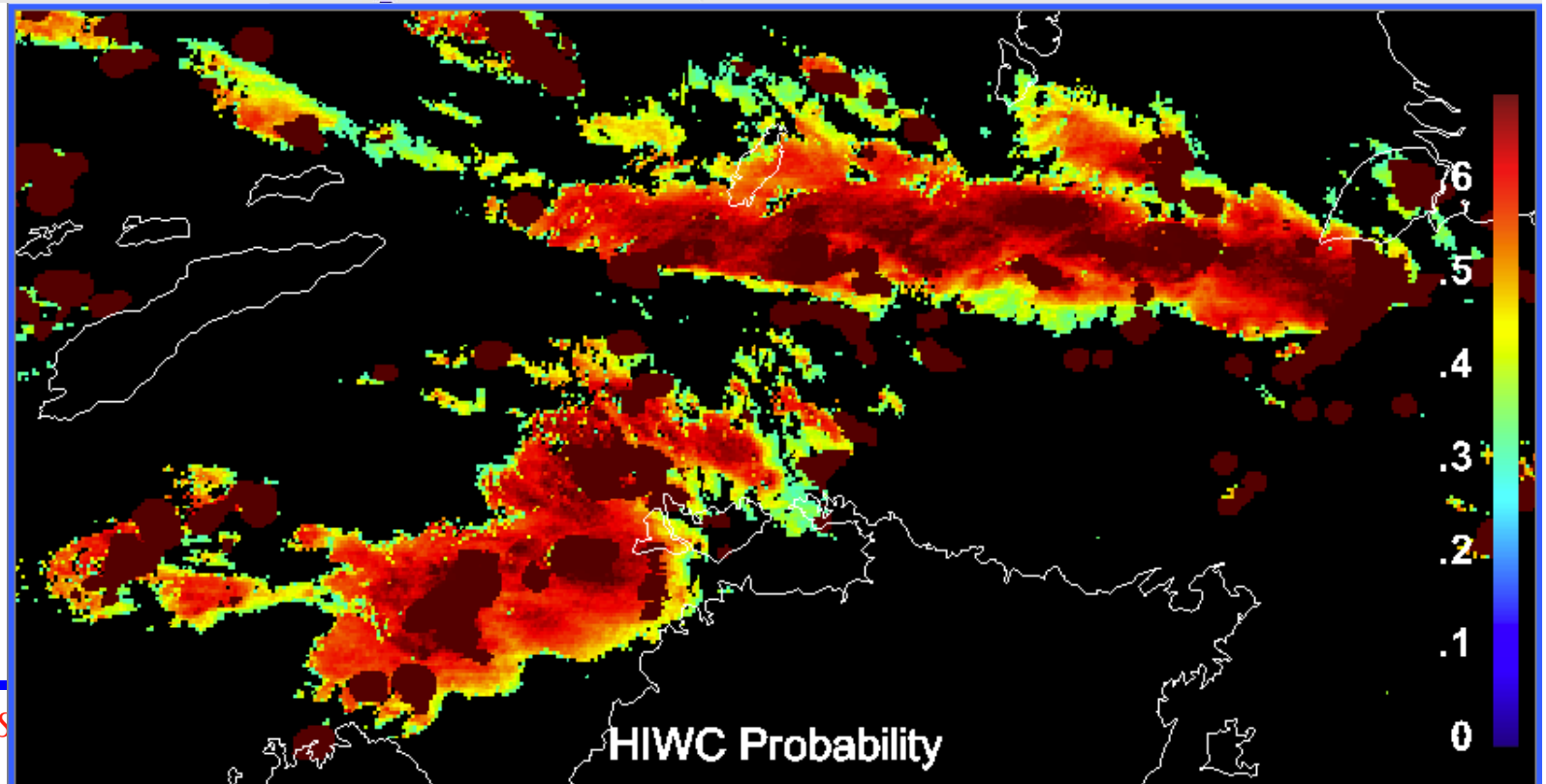
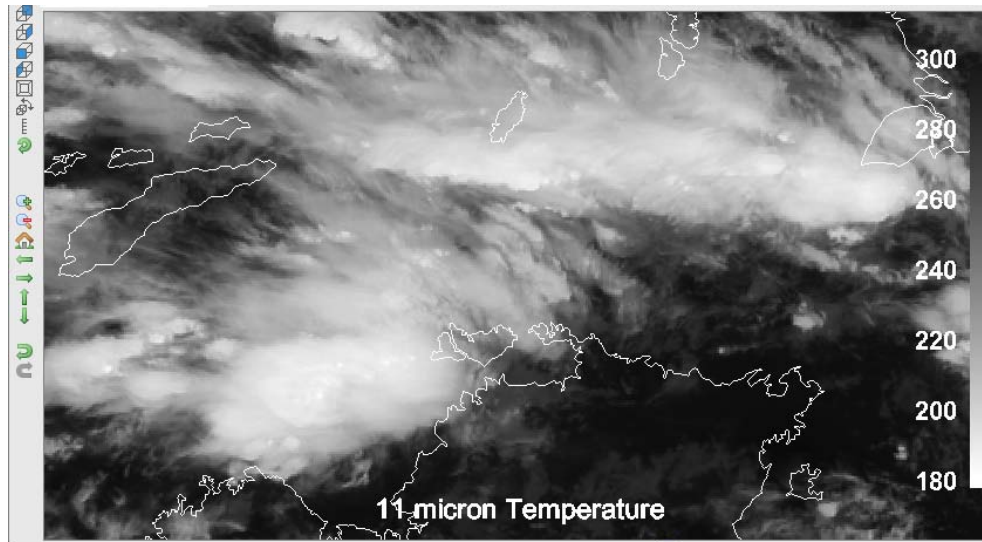
**Top/ Bottom Pressure**

**Top/ Bottom Height**



# HIWC Probability

- Reprocess Darwin MTSAT
- Available for Cayenne and PR



NASA



# Satellite Imagery

- + NASA Home
- + NASA LaRC Home
- + Science Directorate
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- + MSG Cayenne

### Flight Track Overlay

- + Falcon - Sat Imagery
- + Falcon - Product Imagery

NASA NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

+ NASA Portal  
+ Preferences

Search: Keywords + GO

Home Cloud Products Satellite Imagery Field Experiments References Options

### HIWC MTS1 Satellite Imagery

Domain: HIWC MTS1 Satellite Imagery Download / List Available Dates

Date: 2014 02 18

Image: C2RC

Satellite: MTSAT-1

Image Time: 16:10 UTC

Animate: Frames ---

Viewing 1610 UTC C2RC image (02-18-2014).

BT(K) 320 310 300 290 280 270 260 250 240 230 215 200 185

6 MTSAT-1R 10.8 C2 COLOR FEB 18, 2014 16 10Z NASA LaRC

- 0.73um VIS  
- 10.8um IR gray  
- 10.8um IR color  
- 6.8um WV



- Minnis Group Home

+ Cloud Products

+ Satellite Imagery

+ Field Experiments

+ Related References

- + NASA Home
- + NASA LaRC Home
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High Ice Water Content (HIWC)

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Satellite Imagery

- + G13 Costa Rica
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Flight Track Overlay

- + Falcon - Sat Imagery
- + Falcon - Product Imagery

Cloud Products Along Track

- + Falcon

Langley Satellite Support for High Ice Water Content (HIWC) Research

High Ice Water Content (HIWC) Home → Calendar

Flight track calendar from 2014-01-16 to 2014-03-15

January						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				16 (16)	17 (17)	18 (18)
19 (19)	20 (20)	21 (21)	22 (22)	23 (23)	24 (24)	25 (25)
26 (26)	27 (27)	28 (28)	29 (29)	30 (30)	31 (31)	

February						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 (32)
2 (33)	3 (34)	4 (35)	5 (36)	6 (37)	7 (38)	8 (39)
9 (40)	10 (41)	11 (42)	12 (43)	13 (44)	14 (45)	15 (46)
16 (47)	17 (48)	18 (49)	19 (50)	20 (51)	21 (52)	22 (53)
23 (54)	24 (55)	25 (56)	26 (57)	27 (58)	28 (59)	

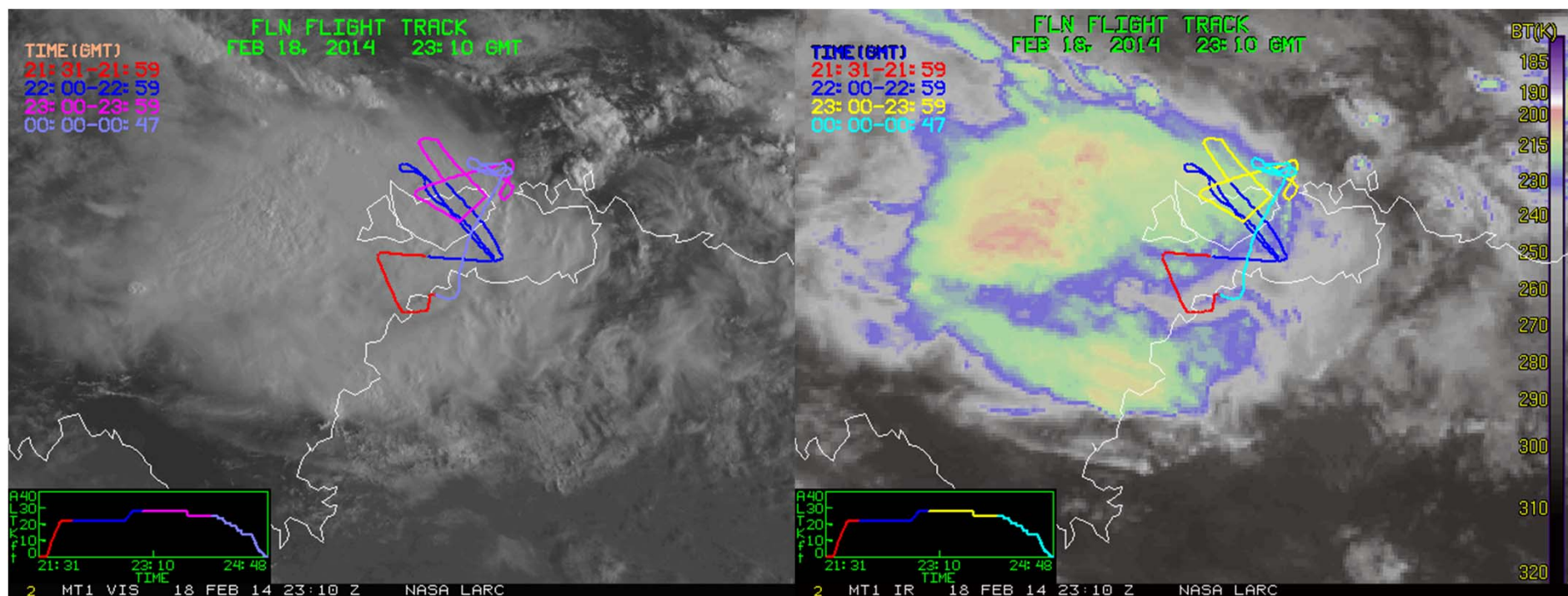
March						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 (60)
2 (61)	3 (62)	4 (63)	5 (64)	6 (65)	7 (66)	8 (67)
9 (68)	10 (69)	11 (70)	12 (71)	13 (72)	14 (73)	



# Flight Track Overlay Satellite Imagery

January						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				16 (16)	17 (17)	18 (18)
19 (19)	20 (20)	21 (21)	22 (22)	23 (23)	24 (24)	25 (25)
26 (26)	27 (27)	28 (28)	29 (29)	30 (30)	31 (31)	

February						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 (32)
2 (33)	3 (34)	4 (35)	5 (36)	6 (37)	7 (38)	8 (39)
9 (40)	10 (41)	11 (42)	12 (43)	13 (44)	14 (45)	15 (46)
16 (47)	17 (48)	18 (49)	19 (50)	20 (51)	21 (52)	22 (53)
23 (54)	24 (55)	25 (56)	26 (57)	27 (58)	28 (59)	



**Flight FS140023 Feb 18, 2014 Visible and IR Loop**

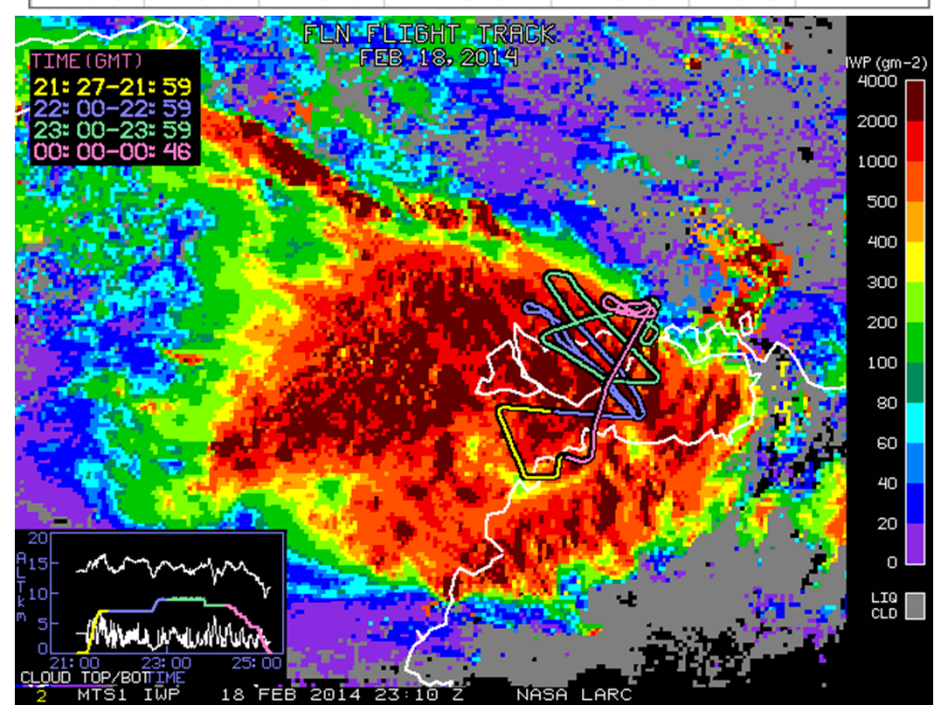
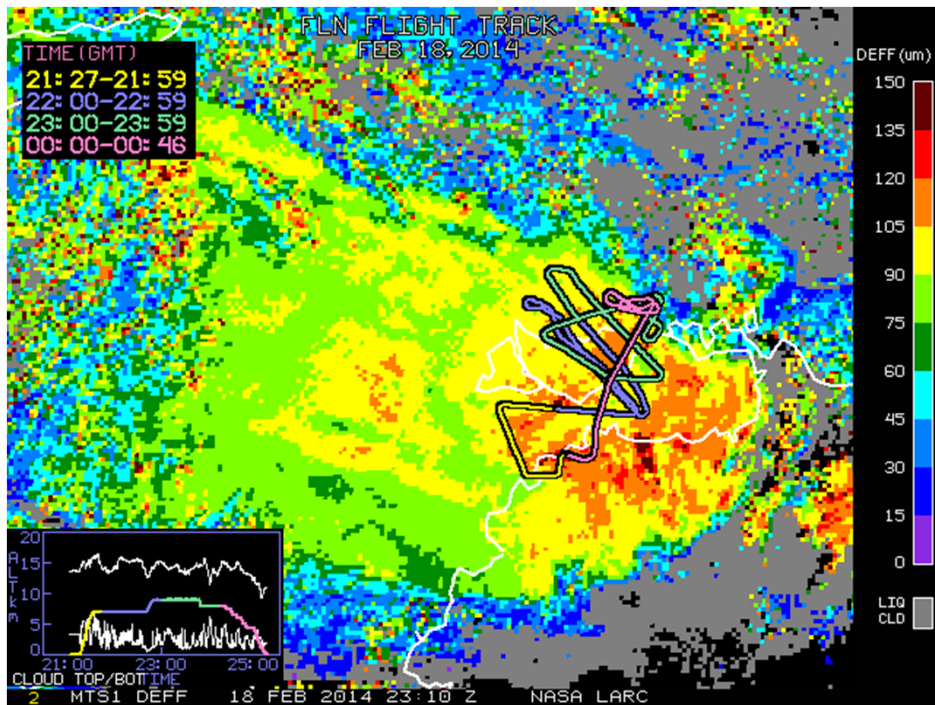




# Flight Track Overlay Cloud Products

January						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				16 (16)	17 (17)	18 (18)
19 (19)	20 (20)	21 (21)	22 (22)	23 (23)	24 (24)	25 (25)
26 (26)	27 (27)	28 (28)	29 (29)	30 (30)	31 (31)	

February						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 (32)
2 (33)	3 (34)	4 (35)	5 (36)	6 (37)	7 (38)	8 (39)
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16 (47)	17 (48)	18 (49)	19 (50)	20 (51)	21 (52)	22 (53)
23 (54)	24 (55)	25 (56)	26 (57)	27 (58)	28 (59)	



**Flight FS140023 Feb 18, 2014, Effective Ice Diameter (left) and Ice Water Path (Rt)**



# Cloud Product Along Flight Track

## Cloud Matching Tool

- Cloud Products
  - + Darwin MT2
  - + RapidScan MTSAT-1R
  - + GOES-13
  - + GOES-13 Cayenne
- Satellite Imagery
  - + G13 Costa Rica
  - + Darwin MTS1
  - + GOES-13
  - + GOES-13 Cayenne
  - + MSG Cayenne
- Flight Track Overlay
  - + Falcon - Sat Imagery
  - + Falcon - Product Imagery
- Cloud Products Along Track
  - + Falcon
- Downloads
  - + HIWC Cloud Products
  - + RapidScan MTSAT-1R
  - + GOES-13 Puerto Rico
  - + HIWC 2015 KML Files
- Viewers / Tools
  - + Satellite Prediction Tool

### VISST Derived Cloud Products Along the Aircraft Track

VISST Derived Cloud Products are computed from the individual aircraft files, where the cloud retrieval parameter is based on the weighted average of 4 imager pixels centered on the aircraft location. The (spatial) standard deviation is based on a weighted distribution of the closest pixel and the 8 surrounding pixels.

Select 4 Cloud Parameters	$\sigma$ Plot	Aircraft/Sat.	Flight Days	Start/End Hour	
Effective Ice Dia. ▾	<input checked="" type="checkbox"/>	Falcon ▾	2014-02-18 ▾	00.0	24.0
Ice Water Path ▾	<input checked="" type="checkbox"/>	MTSat-1 ▾			
Effective Cloud Temp. ▾	<input checked="" type="checkbox"/>				
Cloud Top Ht. ▾	<input checked="" type="checkbox"/>				
<input type="button" value="PLOT"/>					

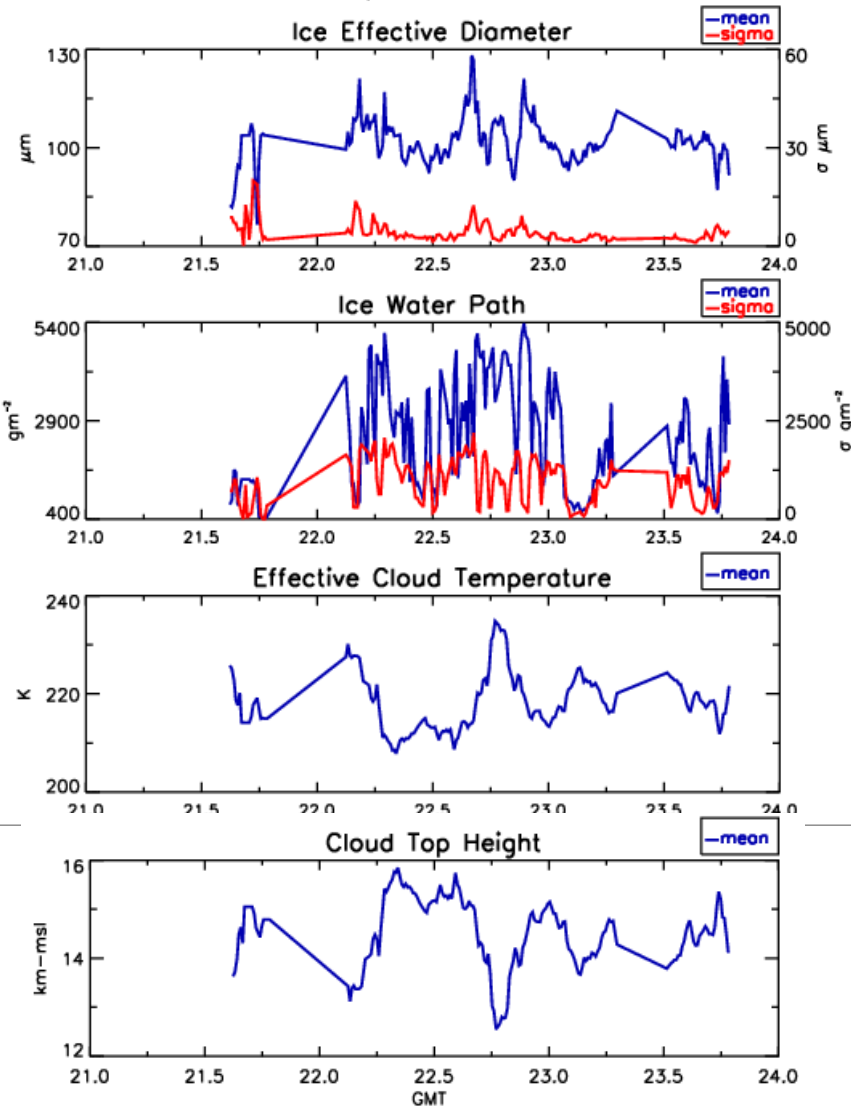


# Cloud Product Along Flight Track

[ASCII File](#) • [Plot](#) • [Full Data File](#)

Results:

NASA-Langley MTS1V VISST Derived Cloud Products  
FAL Matched, 18 FEBRUARY 2014



<b>Cloud Products</b>
+ Darwin MT2
+ RapidScan MTSAT-1R
+ GOES-13
+ GOES-13 Cayenne
<b>Satellite Imagery</b>
+ G13 Costa Rica
+ Darwin MTS1
+ GOES-13
+ GOES-13 Cayenne
+ MSG Cayenne
<b>Flight Track Overlay</b>
+ Falcon - Sat Imagery
+ Falcon - Product Imagery
<b>Cloud Products Along Track</b>
+ Falcon
<b>Downloads</b>
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<b>Viewers / Tools</b>
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- Minnis Group Home

+ Cloud Products

+ Satellite Imagery

+ Field Experiments

+ Related References

+ NASA Home  
+ NASA LaRC Home

Cloud Products

+ Darwin MT2

+ RapidScan MTSAT-1R

+ GOES-13

+ GOES-13 Cayenne

Satellite Imagery

+ G13 Costa Rica

+ Darwin MTS1

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Flight Track Overlay

+ Falcon - Sat Imagery

+ Falcon - Product Imagery

Cloud Products Along Track

+ Falcon

Downloads

+ HIWC Cloud Products

+ RapidScan MTSAT-1R

+ GOES-13 Puerto Rico

+ HIWC 2015 KML Files

## Data Archive: Download via http

Download Files - Domain: RapidScan MTSAT-1R

Click For Files: → [Image Files](#) • [Pixel NetCDF Files](#)

### Available Imagery (Pixel NetCDF Files)

<http://cloudsway2.larc.nasa.gov/prod/exp/hiwc/rscan/visst-pixel-netcdf/2014>

- [01](#)
- [02](#)
- [03](#)

Download Files - Domain: RapidScan MTSAT-1R

Click For Files: → [Image Files](#) • [Pixel NetCDF Files](#)

### Available Imagery (Pixel NetCDF Files)

<http://cloudsway2.larc.nasa.gov/prod/exp/hiwc/rscan/visst-pixel-netcdf/2014/02>

- [01](#)
- [02](#)
- [03](#)
- [04](#)
- [05](#)
- [06](#)
- [07](#)
- [08](#)
- [09](#)
- [10](#)
- [11](#)
- [12](#)

Download Files - Domain: HIWC MTSAT Cloud Pro

[Gridded NetCDF Files](#) • [Pixel NetCDF](#)

Click to view files in month

MTS01V04.0.RS\_HIWC.2014049.0039.PX.04K.CDF.gz

[4049.0019.PX.04K.CDF.gz](#)

- [MTS01V04.0.RS\\_HIWC.2014049.0029.PX.04K.CDF.gz](#)
- [MTS01V04.0.RS\\_HIWC.2014049.0039.PX.04K.CDF.gz](#)
- [MTS01V04.0.RS\\_HIWC.2014049.0049.PX.04K.CDF.gz](#)
- [MTS01V04.0.RS\\_HIWC.2014049.0059.PX.04K.CDF.gz](#)
- [MTS01V04.0.RS\\_HIWC.2014049.0109.PX.04K.CDF.gz](#)
- [MTS01V04.0.RS\\_HIWC.2014049.0119.PX.04K.CDF.gz](#)
- [MTS01V04.0.RS\\_HIWC.2014049.0129.PX.04K.CDF.gz](#)
- [MTS01V04.0.RS\\_HIWC.2014049.0139.PX.04K.CDF.gz](#)
- [MTS01V04.0.RS\\_HIWC.2014049.0149.PX.04K.CDF.gz](#)
- [MTS01V04.0.RS\\_HIWC.2014049.2109.PX.04K.CDF.gz](#)
- [MTS01V04.0.RS\\_HIWC.2014049.2119.PX.04K.CDF.gz](#)
- [MTS01V04.0.RS\\_HIWC.2014049.2129.PX.04K.CDF.gz](#)
- [MTS01V04.0.RS\\_HIWC.2014049.2139.PX.04K.CDF.gz](#)
- [MTS01V04.0.RS\\_HIWC.2014049.2149.PX.04K.CDF.gz](#)
- [MTS01V04.0.RS\\_HIWC.2014049.2209.PX.04K.CDF.gz](#)
- [MTS01V04.0.RS\\_HIWC.2014049.2219.PX.04K.CDF.gz](#)
- [MTS01V04.0.RS\\_HIWC.2014049.2229.PX.04K.CDF.gz](#)
- [MTS01V04.0.RS\\_HIWC.2014049.2239.PX.04K.CDF.gz](#)





# Satellite Products on Google KML/KMZ

Google Earth interface showing satellite products over the Cartier Islands. The map displays a weather overlay with a color scale for precipitation intensity (0 to 150 mm/h). The interface includes a search bar, a left sidebar with 'Places' and 'Layers' panels, and a main map area with a time slider showing 1/18/2014 10:15:24 pm. A legend on the right shows a color scale for precipitation intensity. A data source attribution at the bottom reads 'Data SIO, NOAA, U.S. Navy, NGA, GEBCO'.

**Places Panel:**

- My Places
  - Sightseeing Tour
    - Make sure 3D Buildings
- Temporary Places
  - LaRC-HIWC.kmz
    - 2014-01-17
    - 2014-01-18
      - Flight Track 2...
      - Cloud Product...
      - Sat Imagery 2...
      - Cloud Products 2014-01...
      - Sat. Image Loo...
      - 2359 : NASA L...
      - 2359 : NASA L...
    - 2014-01-23
    - 2014-01-24
    - 2014-01-27
    - 2014-01-28

**Layers Panel:**

- Primary Database
  - Borders and Labels
  - Places
  - Photos

**Cloud Products 2014-01-18 Panel:**

- BBAL
- BBLW
- DEFF
  - 0032 : NASA LaRC M...
  - 0132 : NASA LaRC M...
  - 0232 : NASA LaRC M...
  - 0332 : NASA LaRC M...
  - 0432 : NASA LaRC M...
  - 0532 : NASA LaRC M...
  - 0632 : NASA LaRC M...
- EMIT
- ICNG
- IWP
- LWP
- PBOT
- PEFF

**Map Labels:** Cartier Islands, Grapher, Northern Territory

**Map Footer:** Data SIO, NOAA, U.S. Navy, NGA, GEBCO

**Coordinates:** 14°49'00.08" S 127°51'53.32" E elev 54 m eye alt 1389.09 km

# Conclusion

- New HIWC probability product
- Reprocess Darwin dataset
  - MTSAT1 rapidscan and MTSAT2
- Google Earth kml/kmz updated with archive imagery
- Website: [www-pm.larc.nasa.gov](http://www-pm.larc.nasa.gov)

Feedback for Request:

*Contact: [L.Nguyen@nasa.gov](mailto:L.Nguyen@nasa.gov)*



# Backup Slides



## Standard, Single-Layer VISST/SIST

**0.65, 1.6  $\mu\text{m}$  Reflectances**

**3.7, 6.7, 10.8  $\mu\text{m}$  Temp**

**12 or 13.3  $\mu\text{m}$  Temp**

**Broadband Albedo**

**Broadband OLR**

**Clear-sky Skin Temperature**

**Icing Potential\*\***

**Pixel Lat, Lon**

**Pixel SZA, VZA, RAZ**

### Cloud

**Mask, Phase**

**Optical Depth, IR emissivity**

**Effective droplet Radius or ice  
crystal Diameter**

**Liquid/Ice Water Path**

**Effective Temp, height, pressure**

**Top/ Bottom Pressure**

**Top/ Bottom Height**

## Multi-Layer, CIRT, CO<sub>2</sub> channel only

*Upper &  
lower cloud*

**Multilayer ID (single or 2-layer)**

**effective temperature**

**effective particle size**

**height, top/base height**

**optical depth, thickness**

**ice or liquid water path**

**pressure**

