



Welcome to the RICO data meeting

RICO Data Workshop Agenda (June 27-28, 2005)

Monday 6/27

0830 Welcome and Overview	Rauber & Stevens
1000 Break	
1030 Data Management Overview	Williams
1100 Images from Barbuda	Knight
1115 SPolKa	Rilling
1145 Barbuda PAM Station	Oncley
1200 Lunch	
1300 Soundings (Barbuda and C130)	J. Wang
1330 Routine Data (satellite and catalog)	Stossmeister
1400 Ground Stations	Mayol-Bracero/McQuaid
1430 Break	
1500 King Air	Rodi/Oolman/Haimov
1545 RV Seward Johnson	Kollias/Zuidema
1630 BAE-146	Brown
1715 Adjourn to dinner at 1900	

Tuesday 6/28

0800 C130 (status and RAF instrumentation)

Schanot

0915 Chemistry

Campos, Thornton, Heikes

1000 Break

1030 Aerosol

**Rogers/Jensen, Anderson,
Hudson, & Twohy**

1115 Microphysics

**Rogers, Brenguier,
Chuang, Gerber, Baker**

1215 Lunch

1315 PI Analysis Goals

(5 minutes Each)

1430 Break

1500 PI Analysis Goals

Continued

1600 Discussion of Future Meetings

Rauber & Stevens

1630 Summary and Closing

Rauber & Stevens

1700 Adjourn Meeting

RICO Workshop Logistics

Wireless networking:

For NON-UCAR attendees: go to wireless.ucar.edu
At login page: username= RICO ; password = rico

If you have trouble connecting, chances are it's because your browser's homepage is set to something that has many background links that automatically connect upon startup. Change your homepage (in the options) to something simple, such as www.joss.ucar.edu

For UCAR attendees: go to wireless.ucar.edu
At login page use your CAS username and password

There are power strips stationed around the perimeter around the room so that you can charge your laptop as needed.

Refreshments and lunch:

Morning coffee and two breaks per day will be provided (see agenda for times). The cafeteria in this building serves lunch from 11:30-1:30 daily and is open until 3:30pm for drinks and other snacks. The lunch menu during the workshop will be:

Monday, June 27, 2005

(V) Spanish Soup
Patty Melt Sandwich, Fries
(V) Roma Panini, Pepperoncini
Grilled Teriyaki-Apricot Chicken,
Couscous, Snap Peas

Tuesday, June 28, 2005

Chicken Ole Soup
Cabo Chicken Philly Wrap, Nacho Chips
BBQ Pork Sandwich, Curly Fries
(V) Chile Relleno Casserole, Jalapeno
Cornbread with Honey Butter

Administrative Assistance:

For general administrative needs, please contact Sara Metz at smetz@ucar.edu or 303-497-8166. Sara can also make your dinner reservations if you wish, just send her the details via email.

Technical Assistance:

For help with laptop connection or wireless, please contact John (Jay) Alipit at alipit@ucar.edu or 303-497-8529.

THANK YOU!!!!!!!

Louise Nuijens

Eric Snodgrass

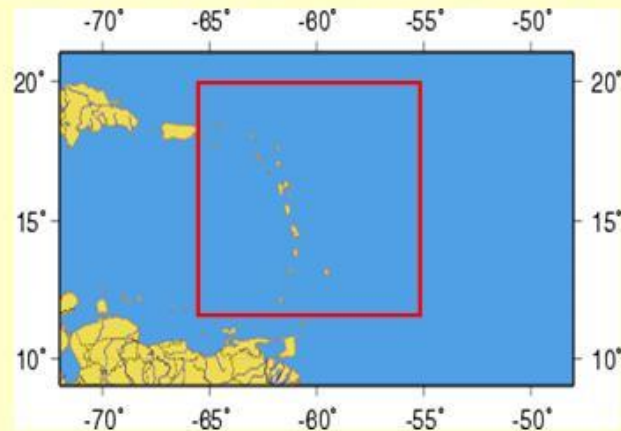
Sabine Goeke

Guangyu Zhao

Iliana Genkova

Marilé Colón Robles

RICO cloud statistics - cloud size and depth



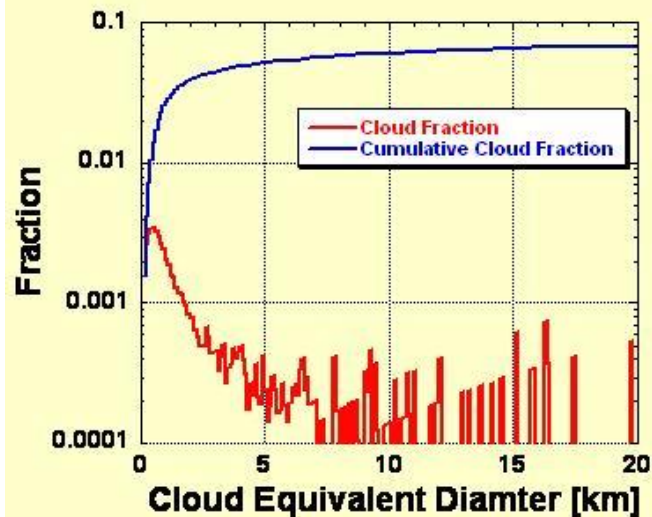
ASTER

138 scenes from 28 separate days 15 m resolution data

- Scene sizes are all the same (60 km x 60 km)
- Onboard EOS-Terra: coincident with MISR and MODIS

Cloud Cover Density

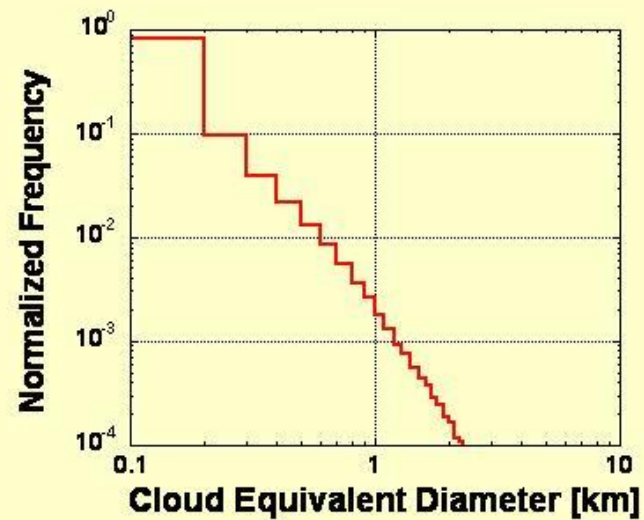
935,858 clouds



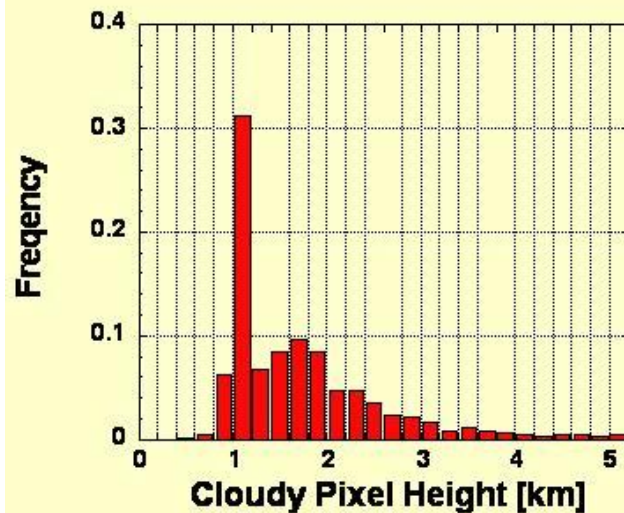
- Dominant cloud diameter ~ 500m
- Total cloud fraction ~8%
- Half the cloud fraction is from clouds smaller than 1.5 km in diameter

Cloud Size Distribution

$$n(D) = n_0 D^{-\alpha}, \quad \alpha = \mathbf{2.99} \quad (R=0.99983)$$

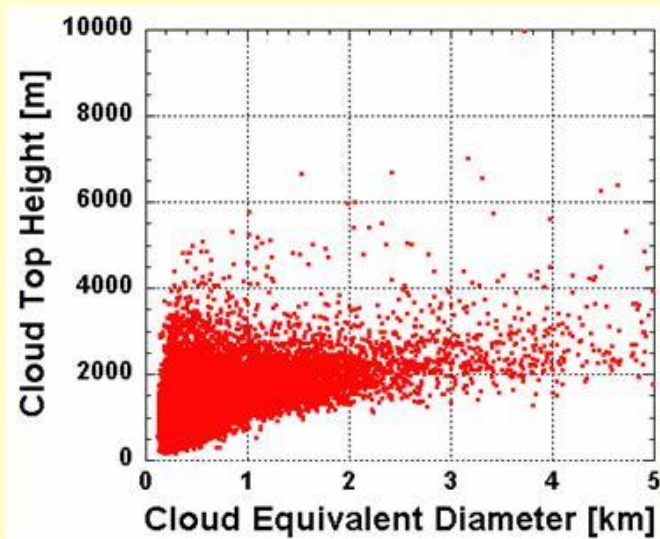


Cloud Height Histogram

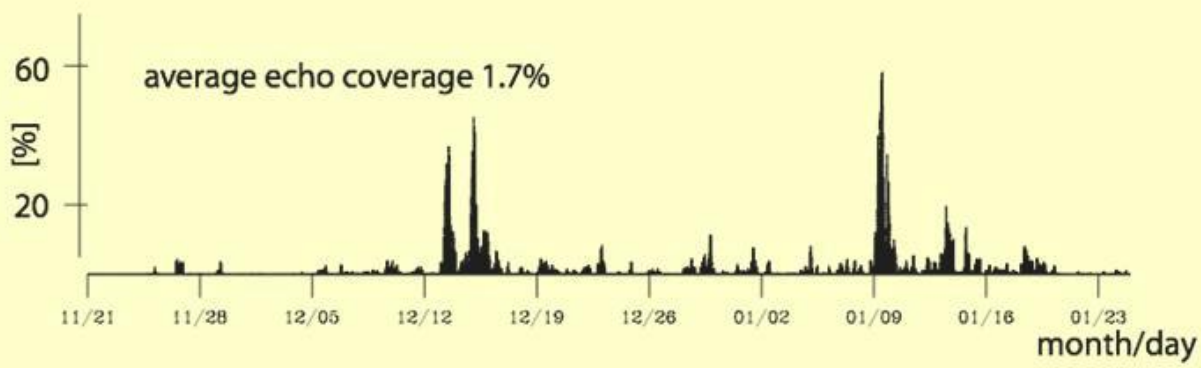
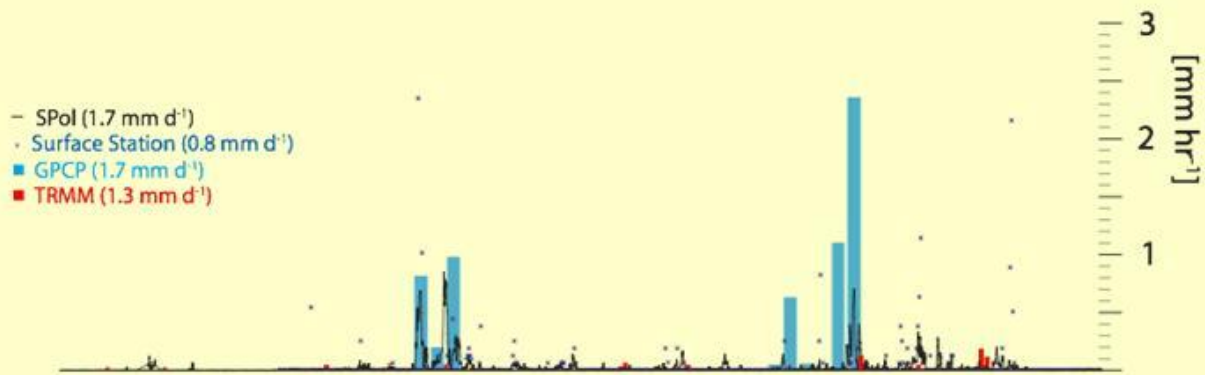


- 90 m resolution from TIR band
- Only fully cloudy 90-m pixels based on 15 m cloud mask

Maximum Cloud Top Height vs. Cloud Size

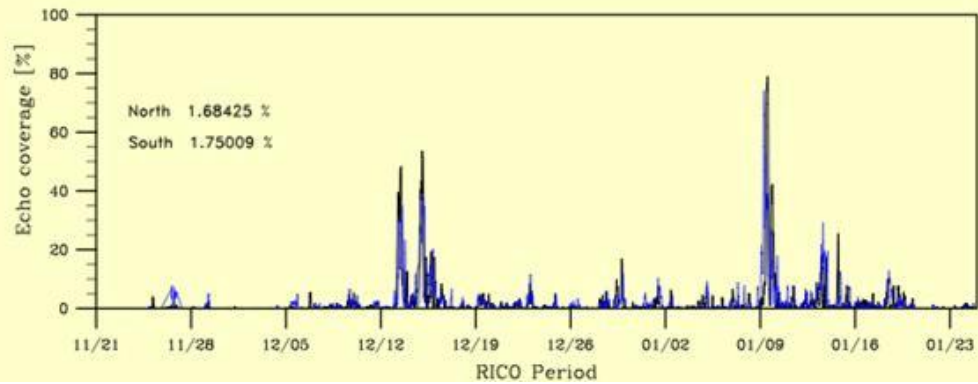
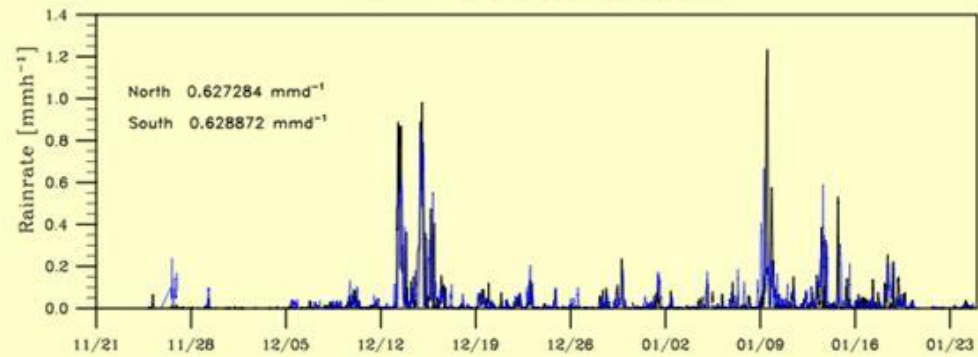


- Larger clouds have higher tops



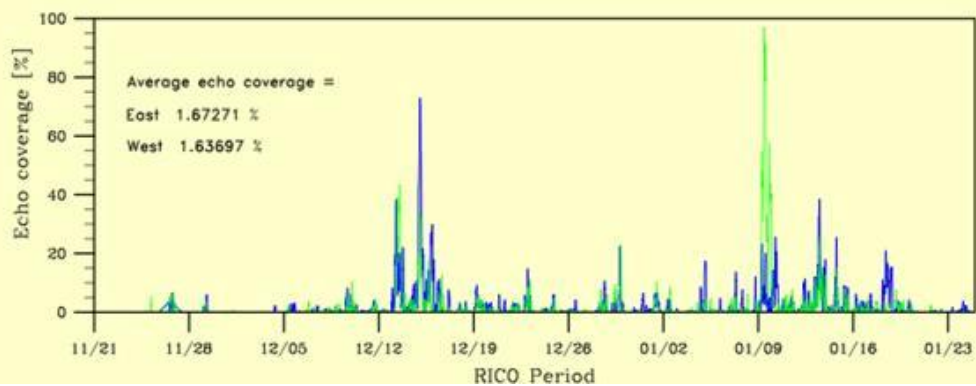
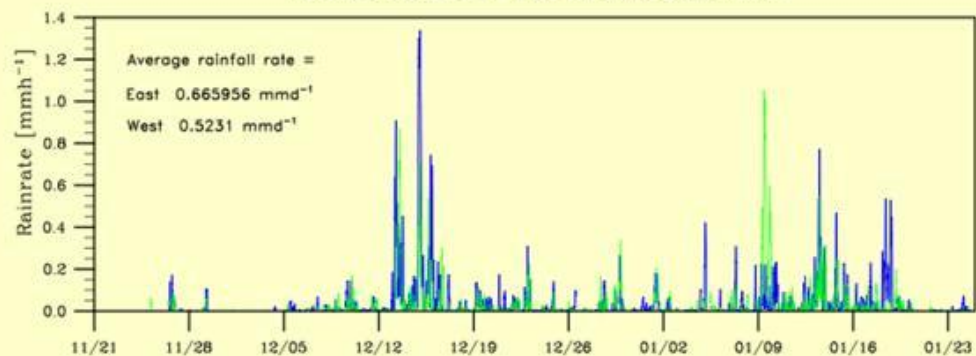
Exploring spatial biases: N versus S, all surveillance Scans

RICO - Time series of rainfall

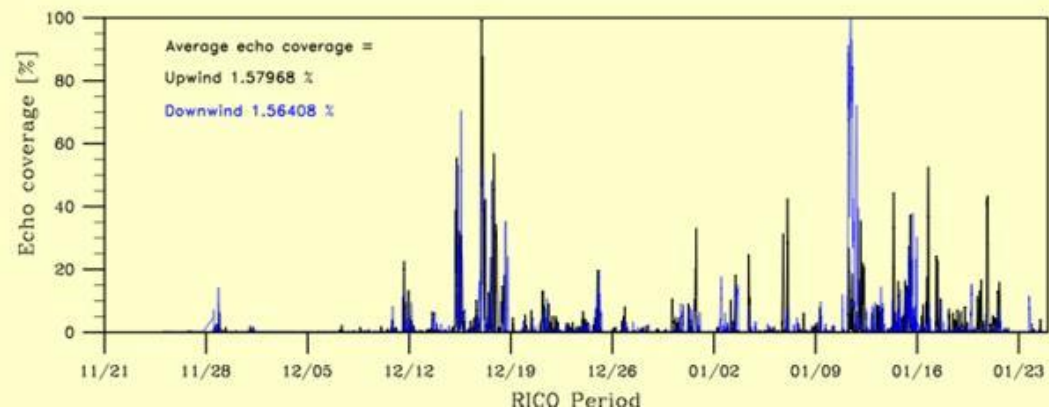
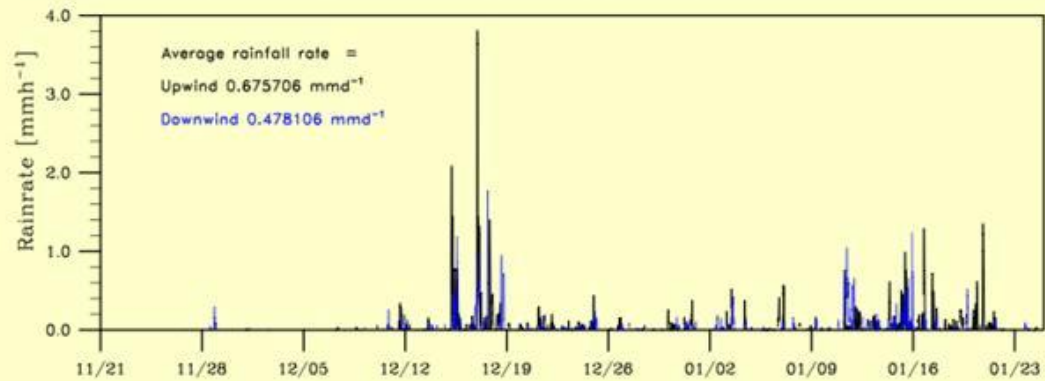


Exploring spatial biases: E versus W, all surveillance Scans

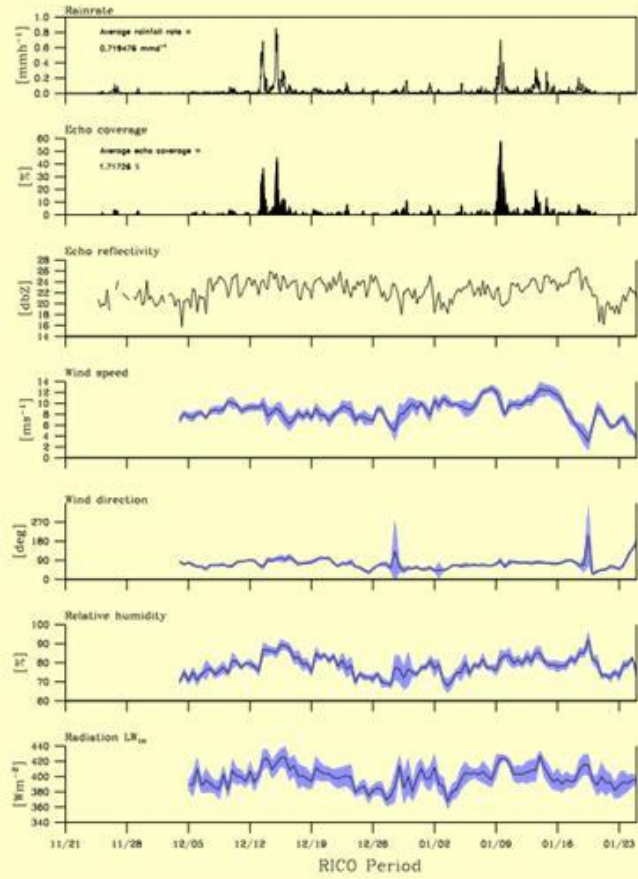
RICO east/west - Time series of rainfall



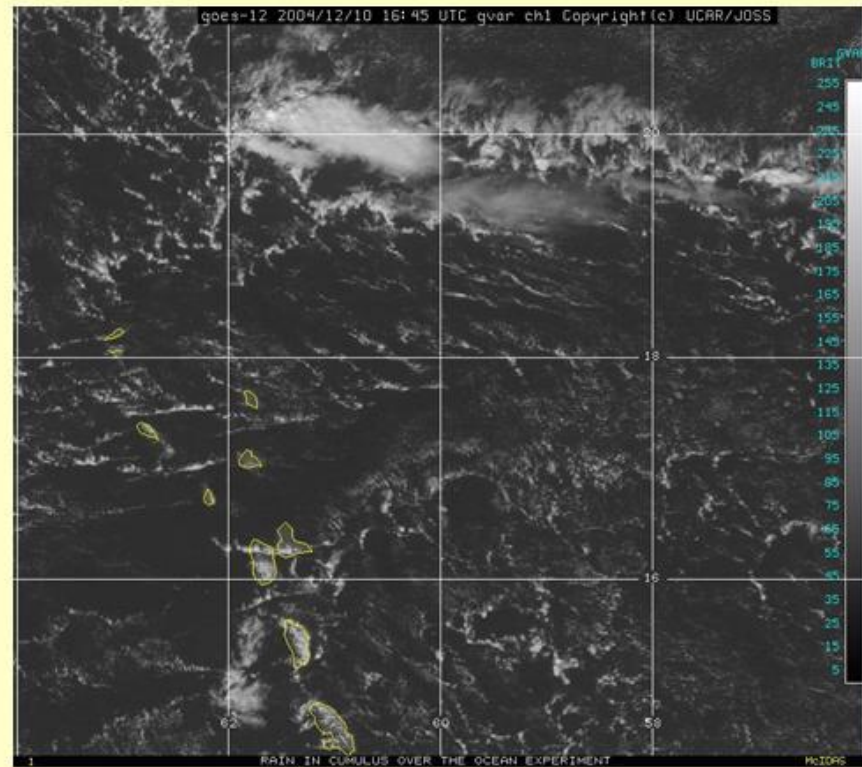
Exploring spatial biases: Upwind versus Downwind

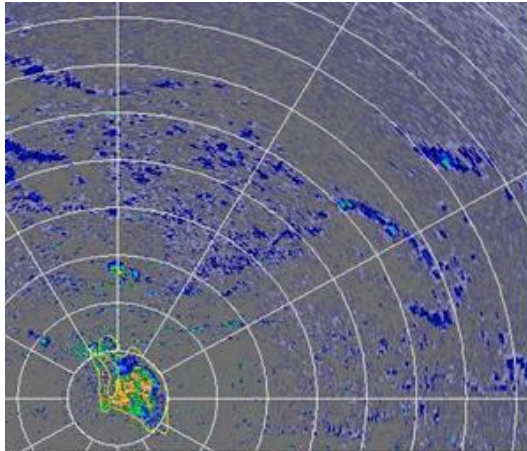


RICO - Time series

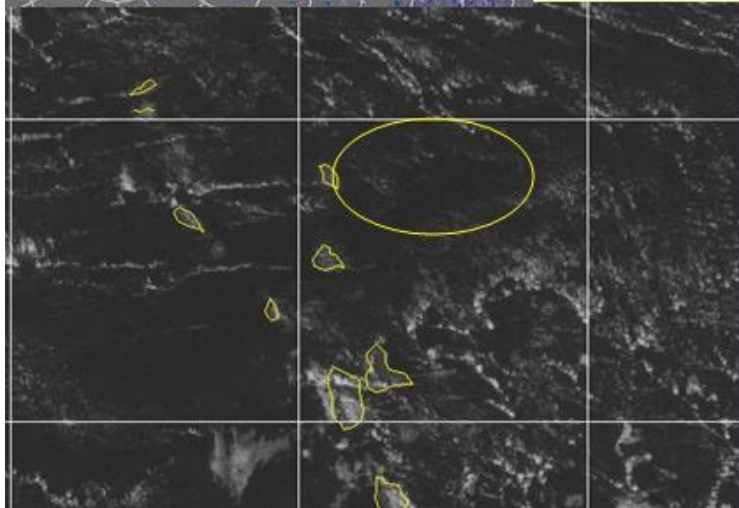


Overview of cloud organizations during RICO

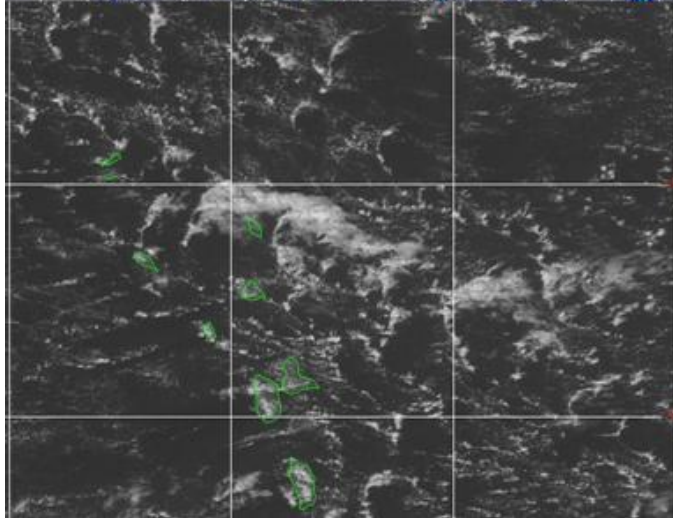
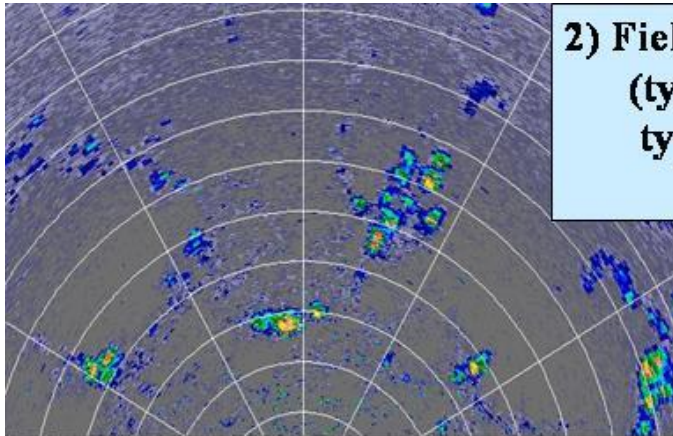




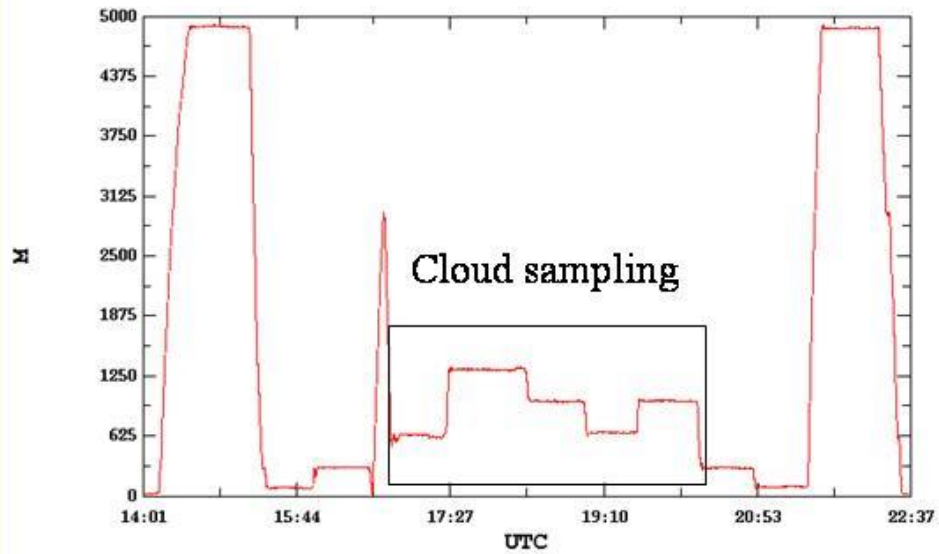
**1) Fields of small trade wind cumulus
(typical cloud base 600 m [2000 ft]
typical cloud top ~ 1200-1500 m
[4000-5000 ft])**



2) Fields of trade wind congestus
(typical cloud base 600 m [2000 ft])
typical cloud top ~ 2000-3000 m
[7000-10000 ft]

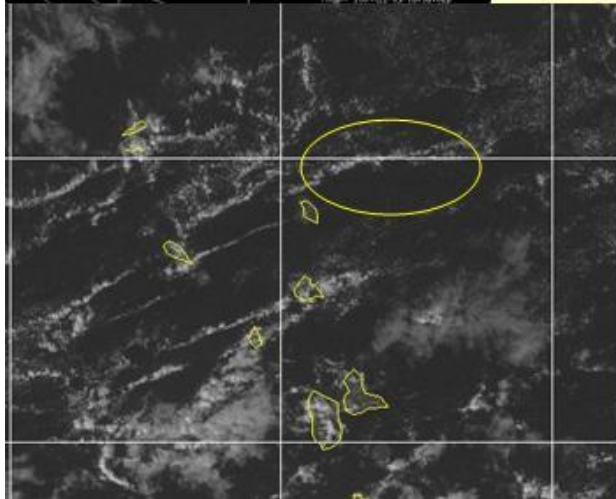
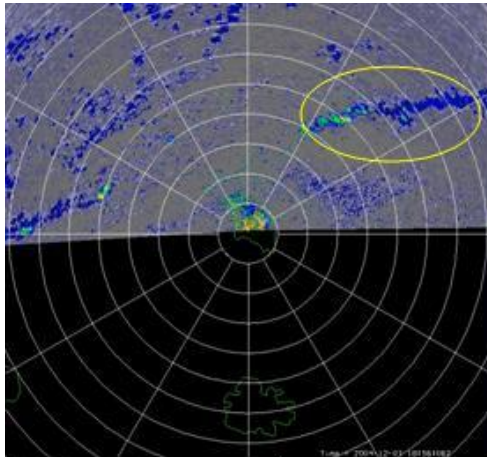


RICO, Flight #rf04
12/10/2004, 14:01:04-22:37:00

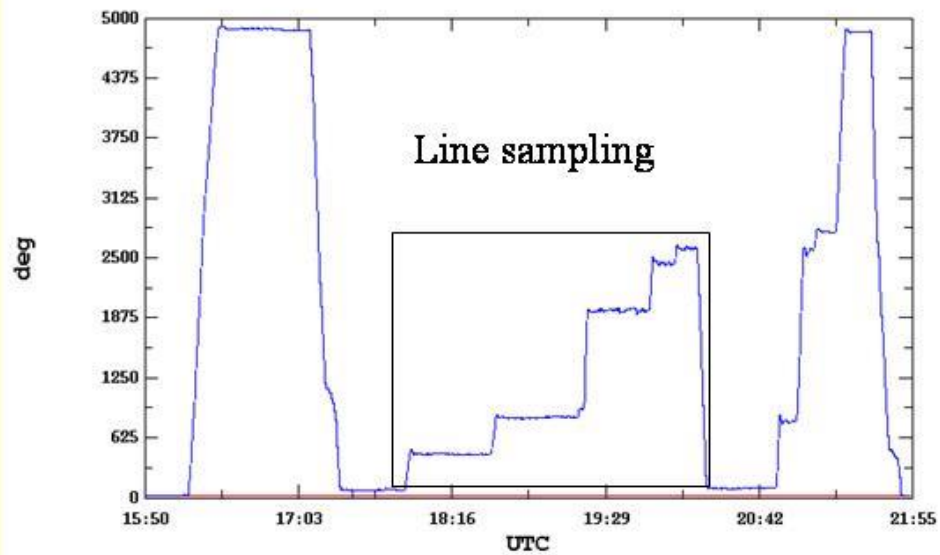


Cloud passes at 625 m, 1000 m, and 1250 m

**3) Organized lines of developed cumulus
(typical cloud base 600 m [2000 ft]
typical cloud top ~ 2400-3600 m
[8000-12000 ft])**

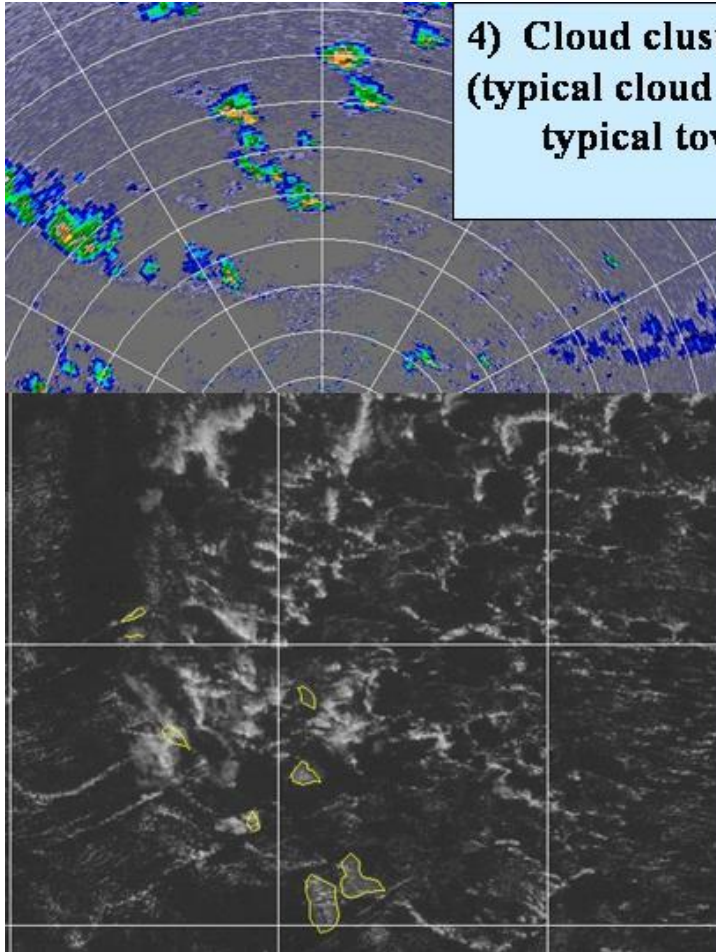


RICO, Flight #rf01
12/07/2004, 15:50:52-21:55:39

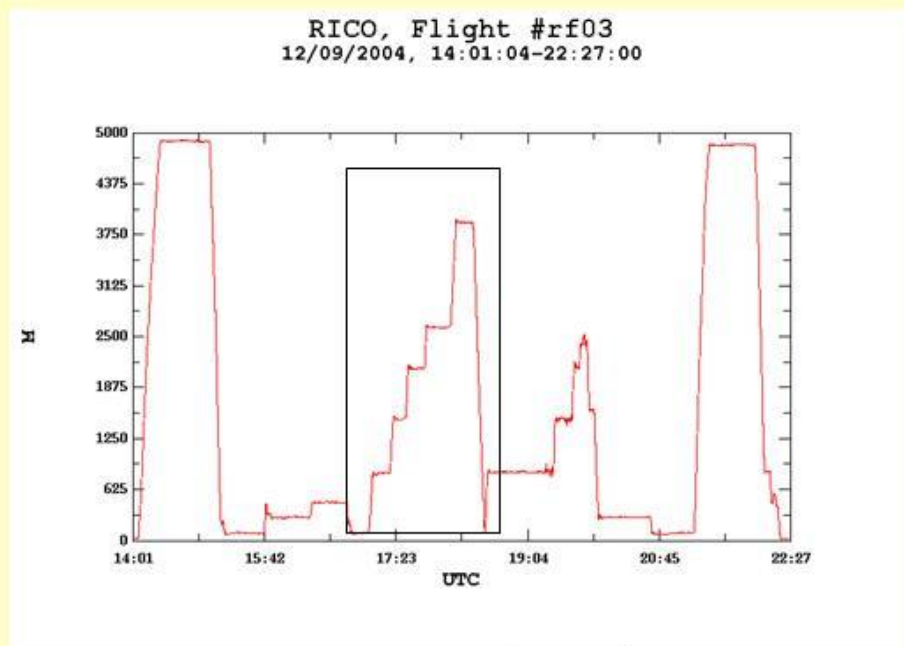


Cloud passes at 450 m, 850 m, 2000 m, 2400 and 2600 m

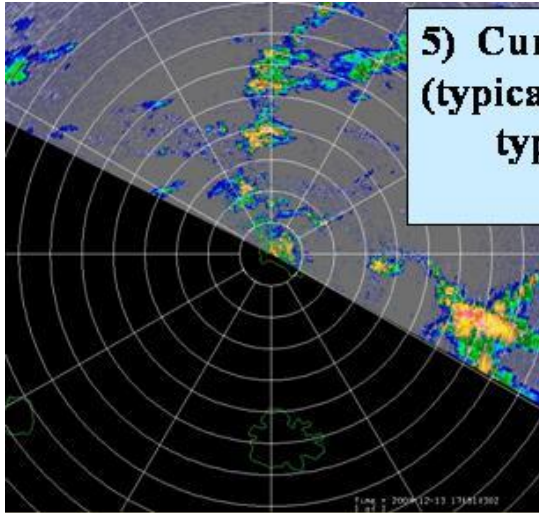
4) Cloud clusters with emerging towers
(typical cloud base 500-600 m [1600-2000 ft])
typical tower top ~ 2400-3600 m
[8000-12000 ft]



Cluster/tower sampling



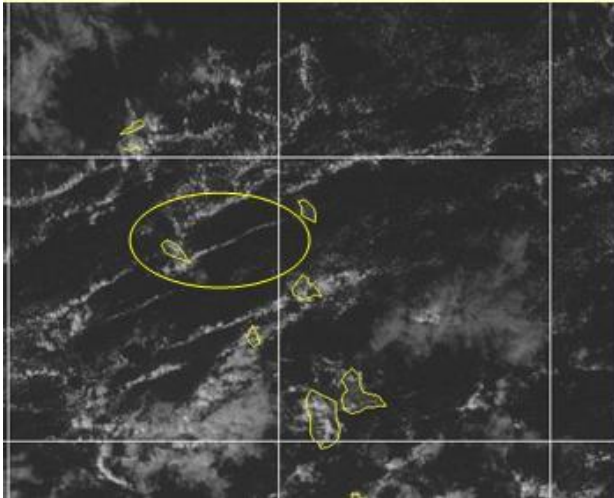
Cloud passes at 100 m, 800 m, 1500 m, 2100 m, and 2600 m



**5) Cumulonimbus (many above freezing level)
(typical cloud base 500-600 m [1600-2000 ft]
typical deep cloud top > 2400 m
[> 6000 m])**



6) Barbuda Tail Clouds

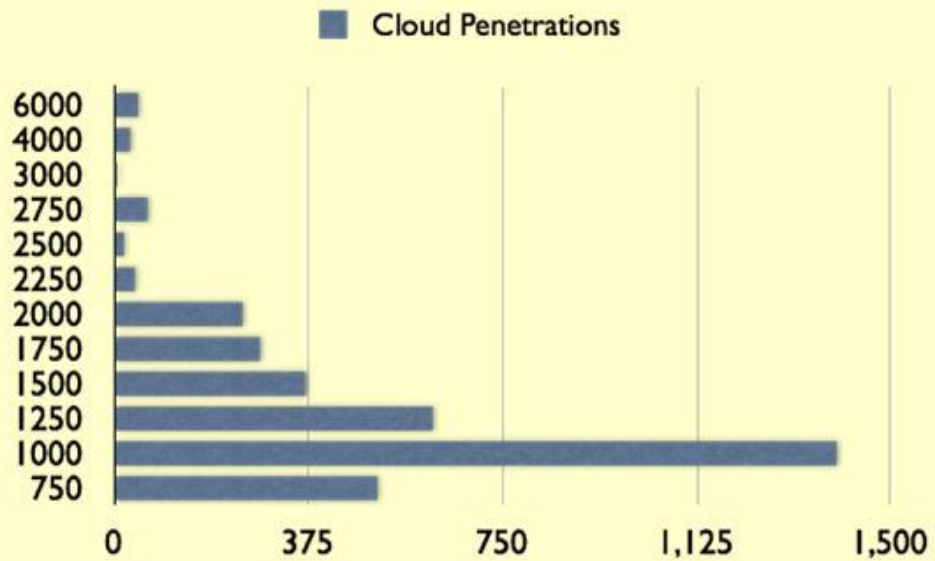


NCAR C-130 Cloud sampling

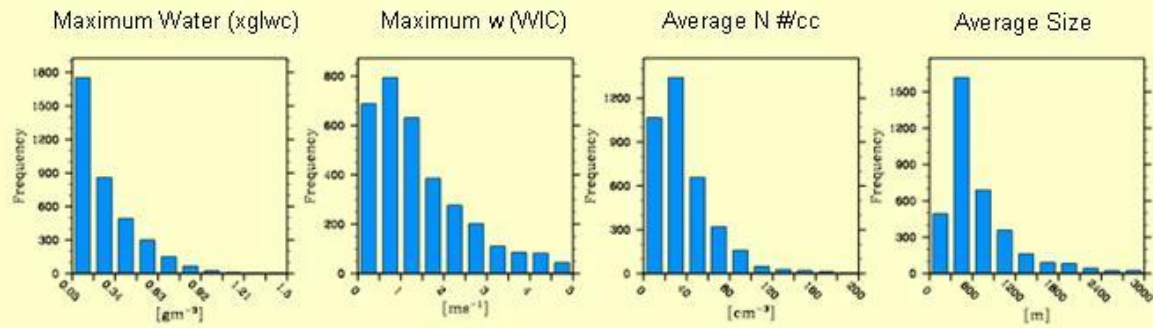


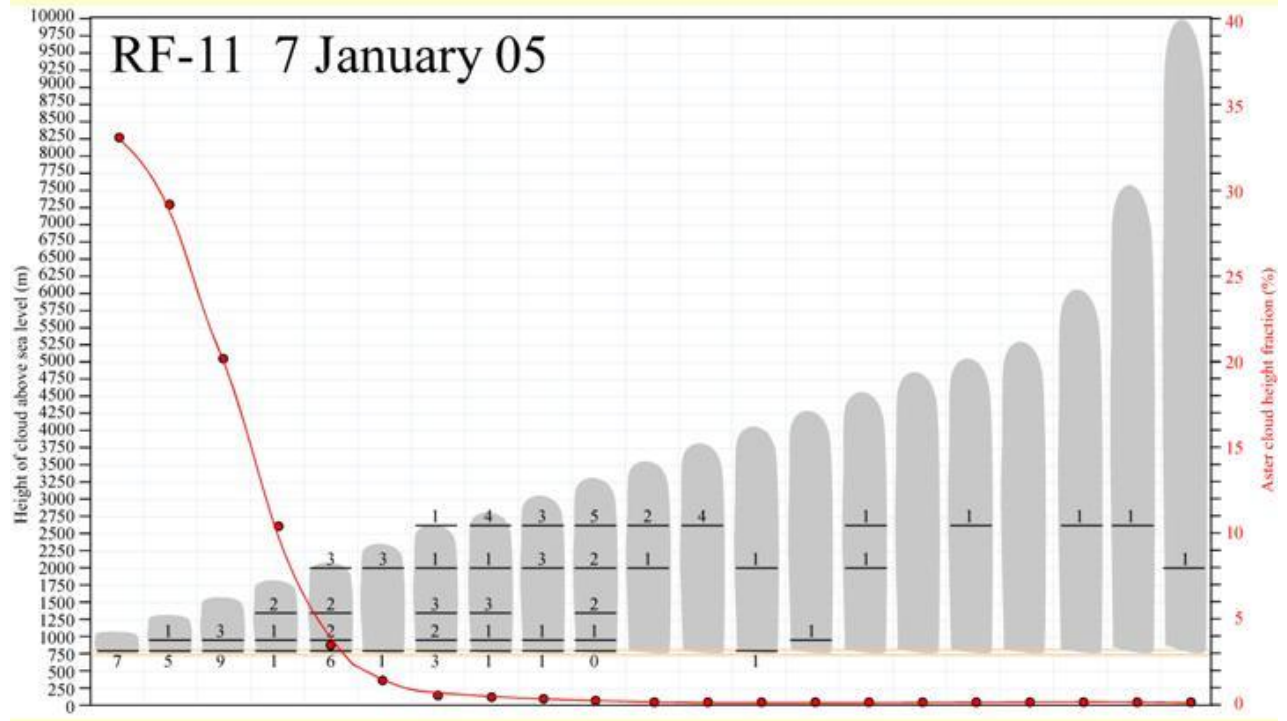
Summary of sampling during 19 C-130 Flights

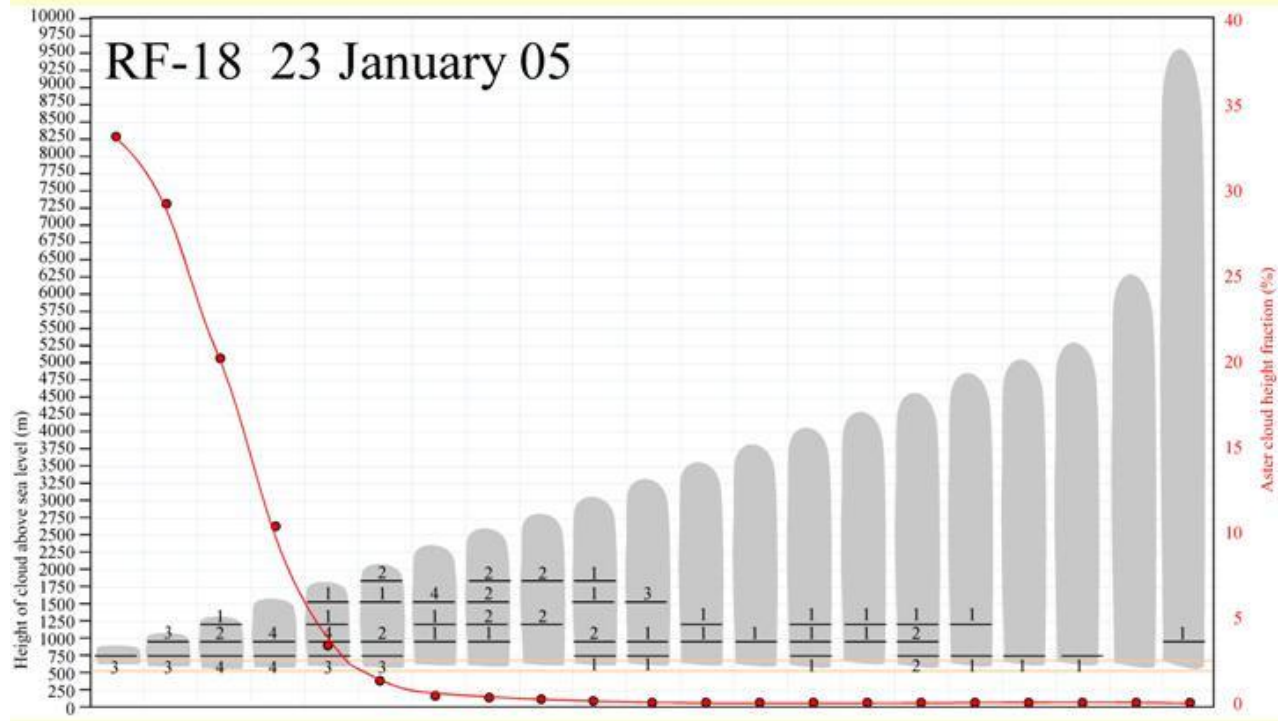
Flight	<i>(Single Clouds)</i>			<i>(Organized clouds)</i>			Circles	Cal/Intercomp
	Circles	Cumulus	Congestus	C-Nimbus	Line	Clusters			Tail
RF01	3				X			0
RF02	0							Cal
RF03	3	X	X			X		3
RF04	3	X						3
RF05	3		X	X				3
RF06	3	X						3
RF07	3	X	X					3
RF08	3	X	X					3
RF09	3	X						3
RF10	3	X	X					3
RF11	3	X	X		X			3
RF12	3	X	X					3
RF13	3					X		3
RF14	3		X					3
RF15	3		X		X			3
RF16	2				X		X	1
RF17	3		X		X			3
RF18	3	X						3
RF19	3	X	X					3



All C130 Cloud Penetrations: Contiguous Regions with FSSP Numbers > 10 per cubic centimeter

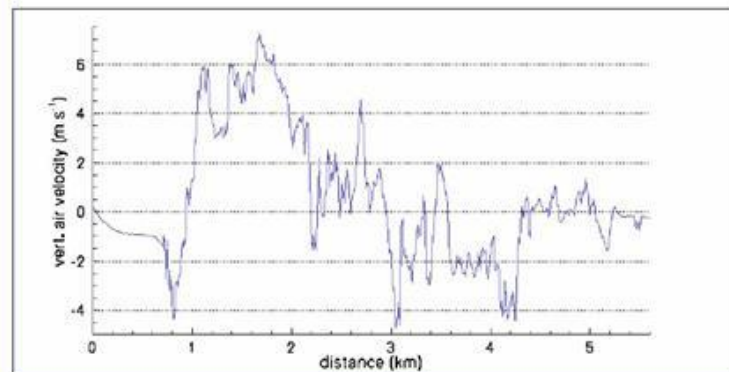
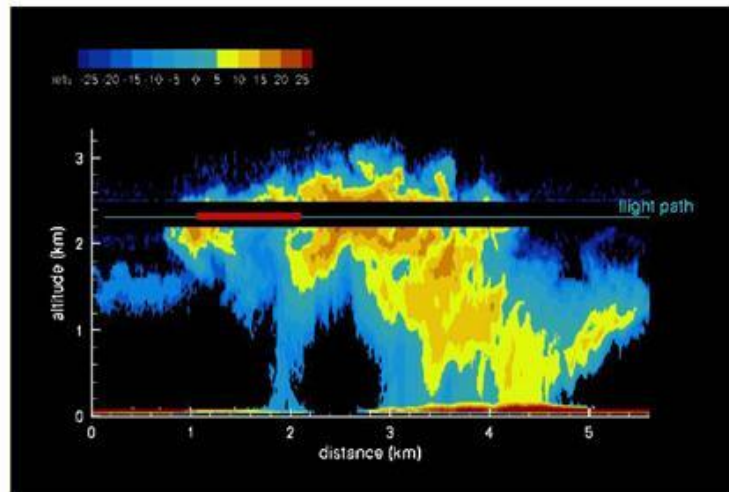






University of Wyoming King Air





UW King Air flew 29 flights, typically 3.5 to 4 hour duration

Concentrated mostly on process studies of cumulus congestus that were producing rain

Take advantage of Cloud radar

UK Met Office BAE-146



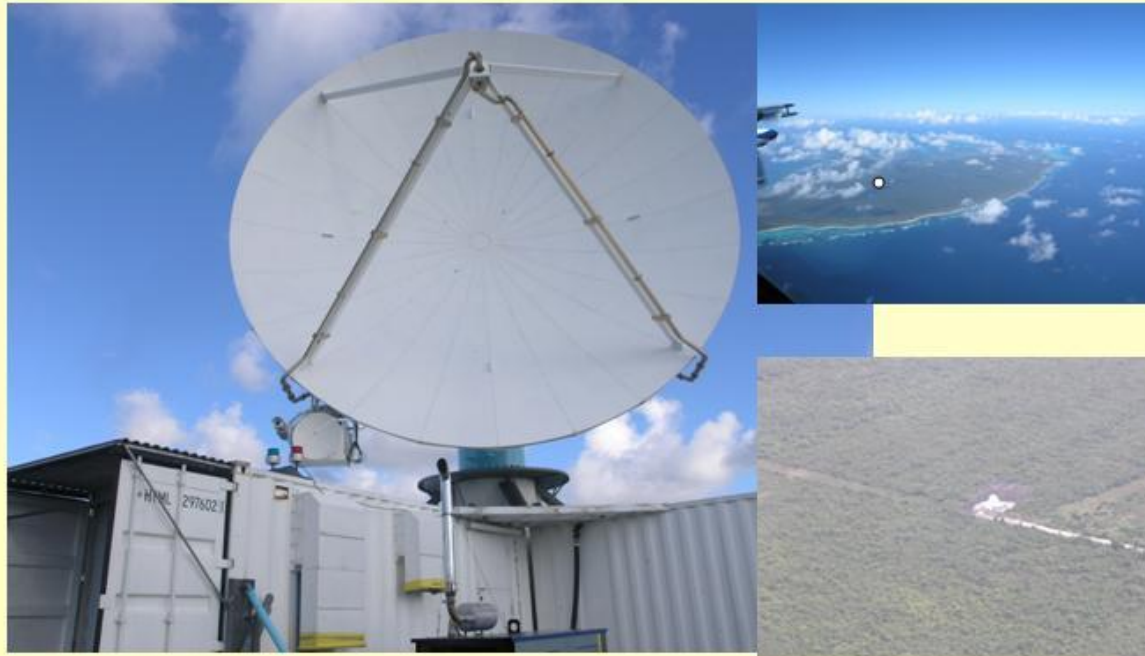
BAE-146 Flew 9 flights, typically 5 hour duration

Used same sampling approach as C-130

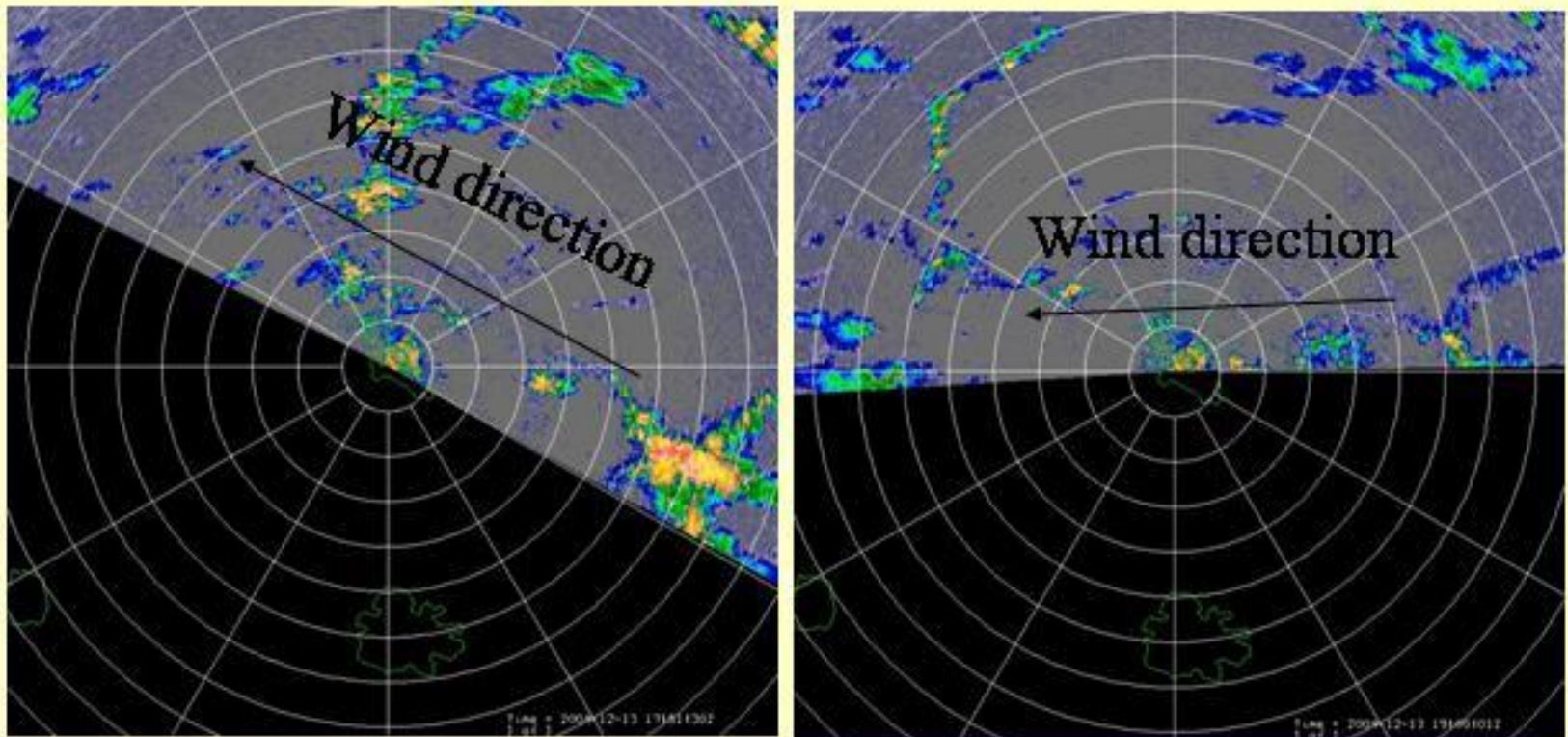
Only flew in January period (Jan 10 – 24)

Four flights coordinated with C-130

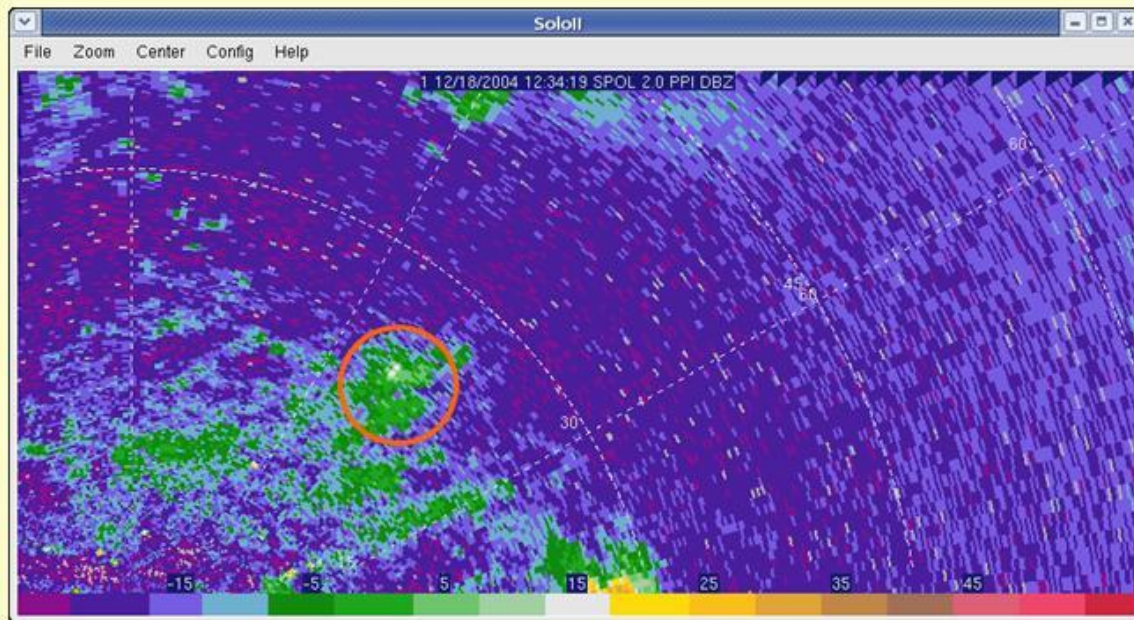
SPOL S Band (10 cm) and K Band (0.8 cm) radar



Scan sequences: 1) Standard: 180 degree volume sector scan aligned with wind: goal to complete volume in under 3 minutes (scans at 0.5, 1.5, 2.5, 3.5, 4.5 degrees etc. until all clouds are topped)



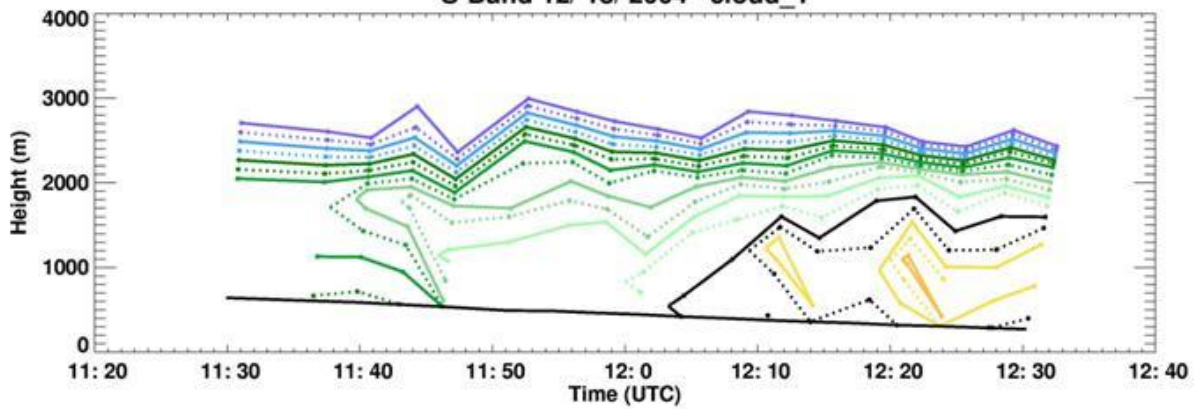
18 December 2004



Reflectivity S-band (dBZ)
2.0° elevation

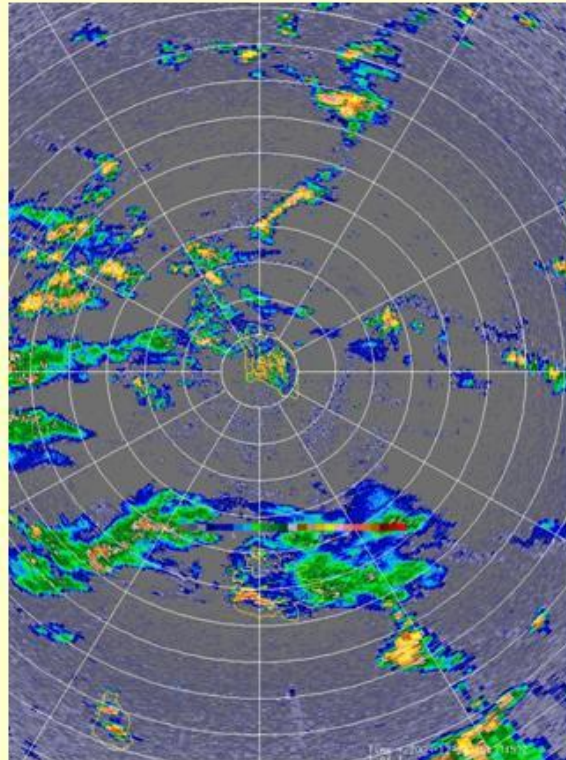


S-Band 12/ 18/ 2004 cloud_1



- | | | | |
|-------|-------------|-------|--------------|
| — | 50.0000 dBZ | ..... | 17.5000 dBZ |
| ..... | 47.5000 dBZ | —— | 15.0000 dBZ |
| —— | 45.0000 dBZ | ..... | 12.5000 dBZ |
| ..... | 42.5000 dBZ | ..... | 10.0000 dBZ |
| —— | 40.0000 dBZ | ..... | 7.50000 dBZ |
| ..... | 37.5000 dBZ | ..... | 5.00000 dBZ |
| —— | 35.0000 dBZ | ..... | 2.50000 dBZ |
| ..... | 32.5000 dBZ | ..... | 0.00000 dBZ |
| —— | 30.0000 dBZ | ..... | -2.50000 dBZ |
| ..... | 27.5000 dBZ | ..... | -5.00000 dBZ |
| —— | 25.0000 dBZ | ..... | -7.50000 dBZ |
| ..... | 22.5000 dBZ | ..... | -10.0000 dBZ |
| —— | 20.0000 dBZ | ..... | -12.5000 dBZ |
| ..... |  | ..... | -15.0000 dBZ |

2) Surveillance
scans (0.5 degree)
every 25-30 minutes

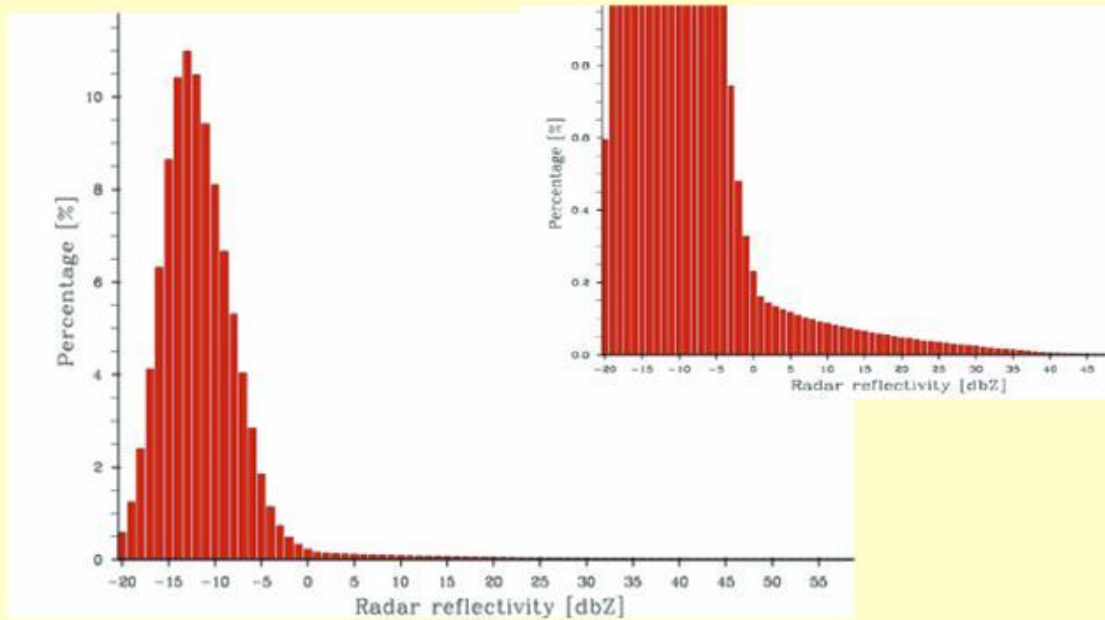


Terra-satellite overpasses: Special scan sequences with some additional modification in Jan to accommodate other goals

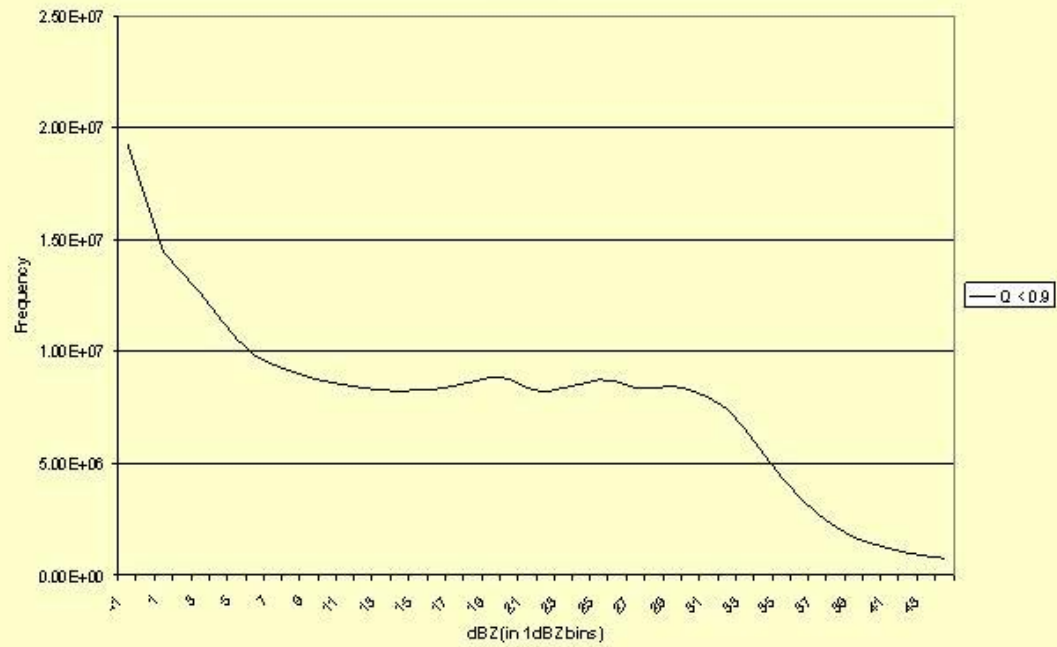
December: Continuous 0.5 degree surveillance scans

January: Volume scans, but with bottom scan (0.5 degree) a surveillance scan instead of a 180 degree scan

RHI scans were done rarely, primarily during periods when the Barbuda tail was prominent and a few times other than that.

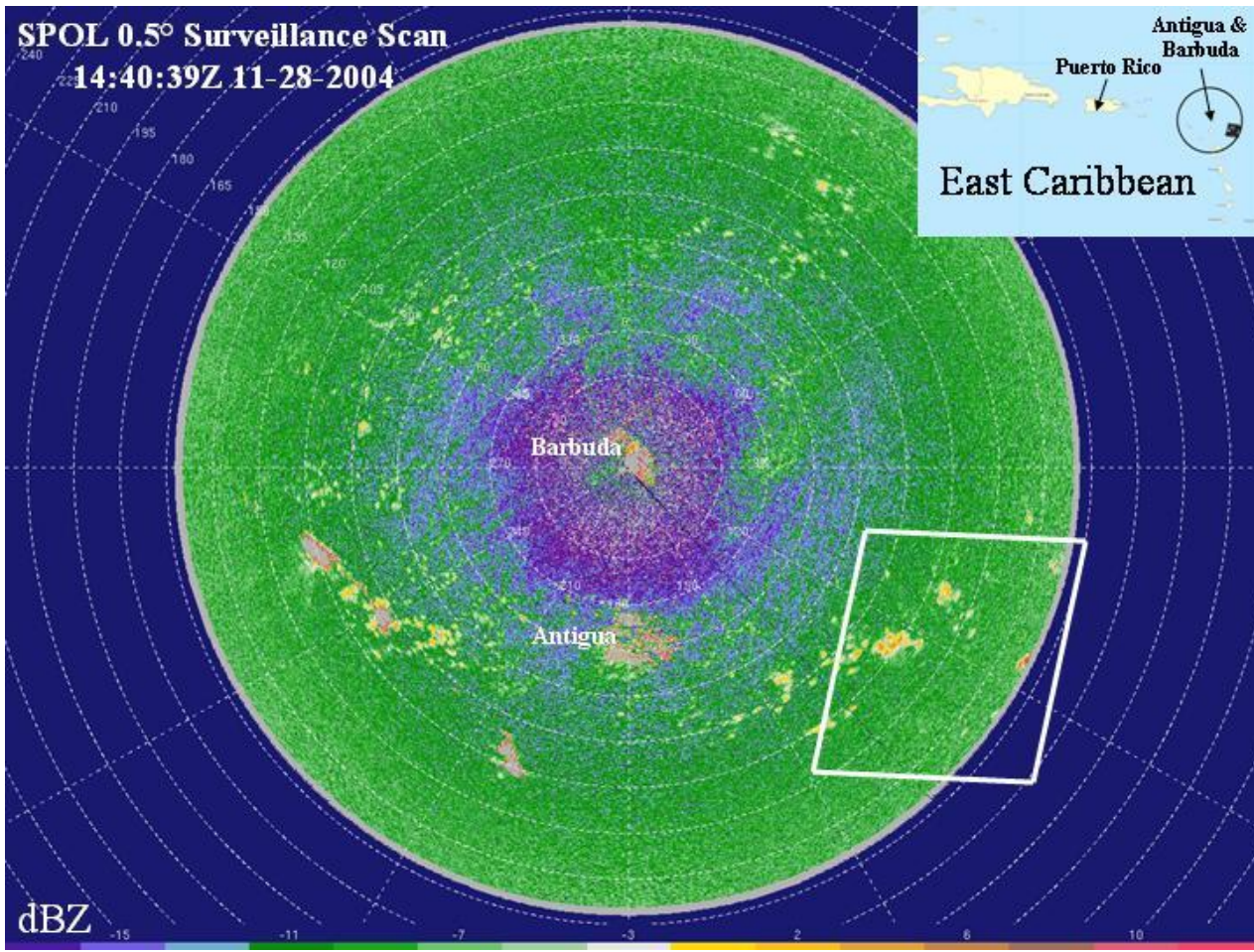


Histogram of dBZ for all 0.5 deg PPI scans
20209 Files



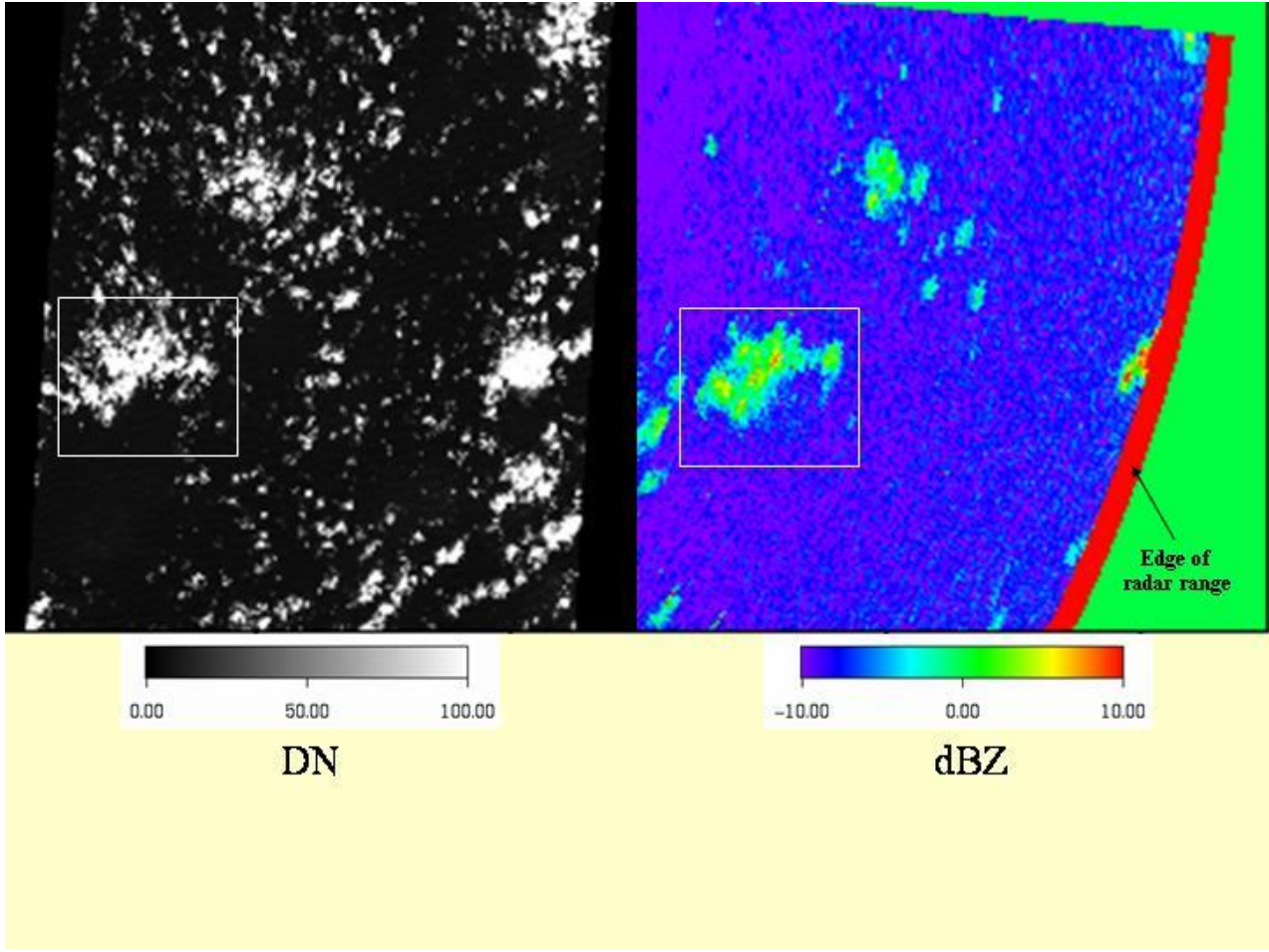
SPOL 0.5° Surveillance Scan

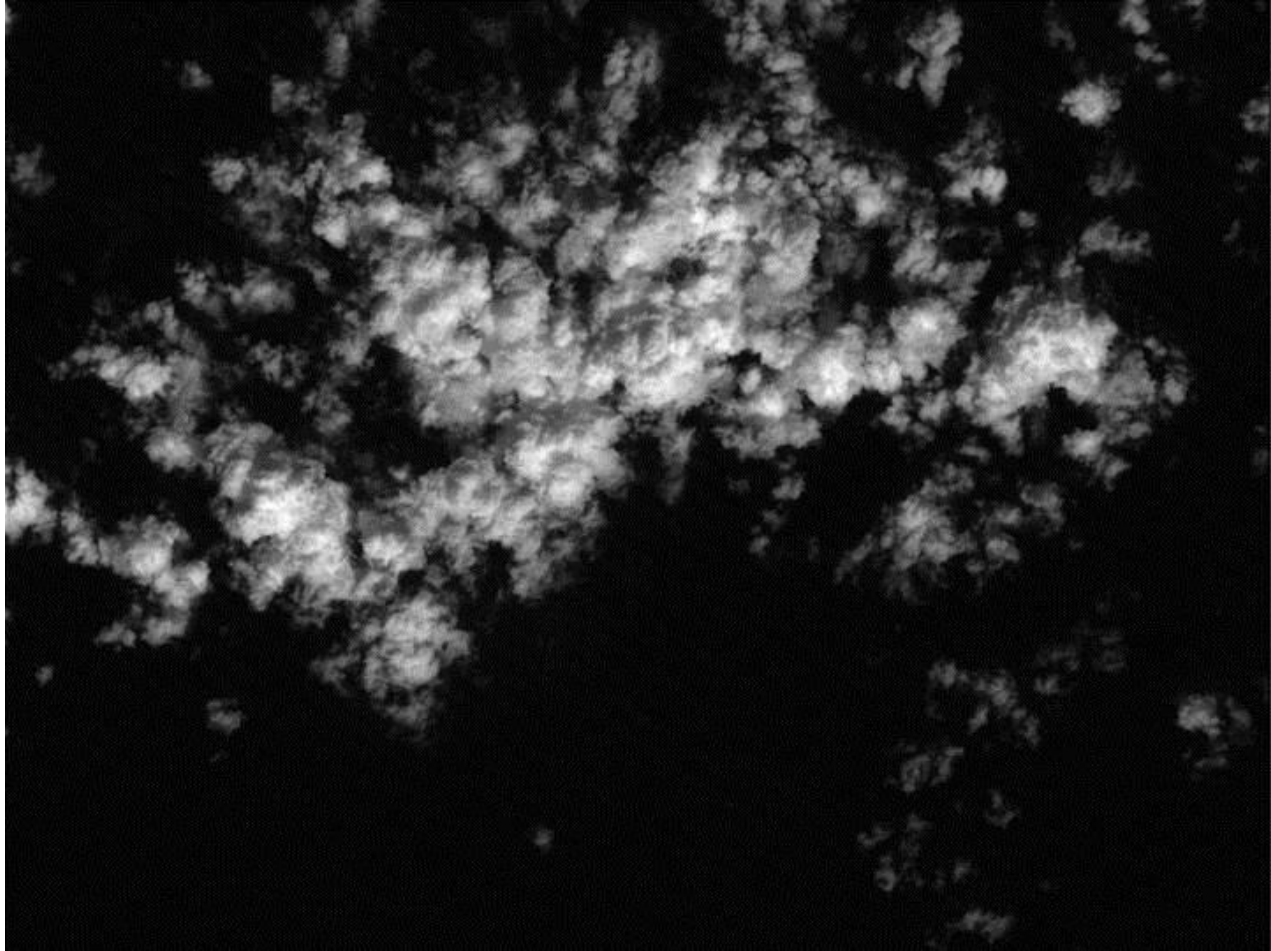
14:40:39Z 11-28-2004

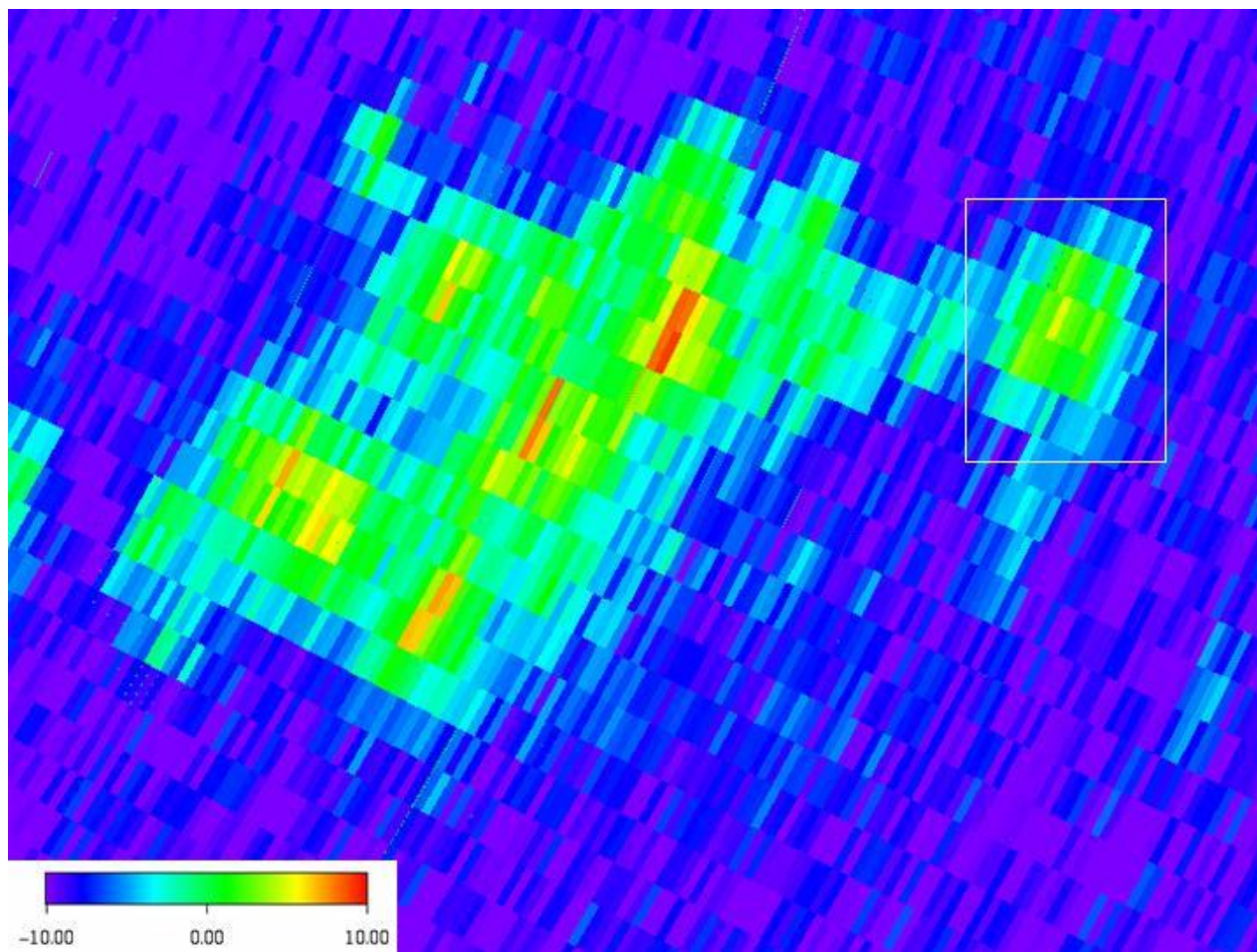


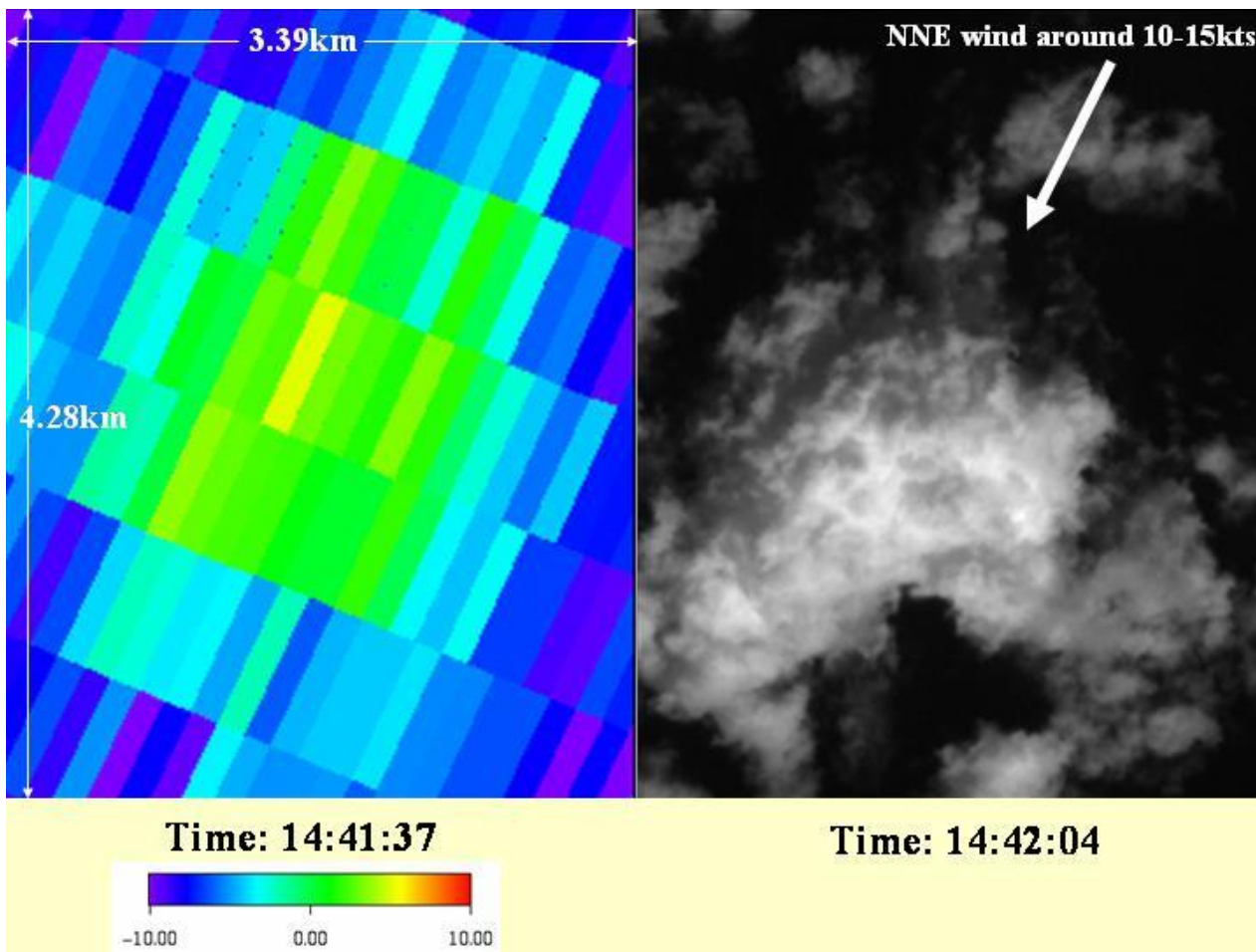
dBZ

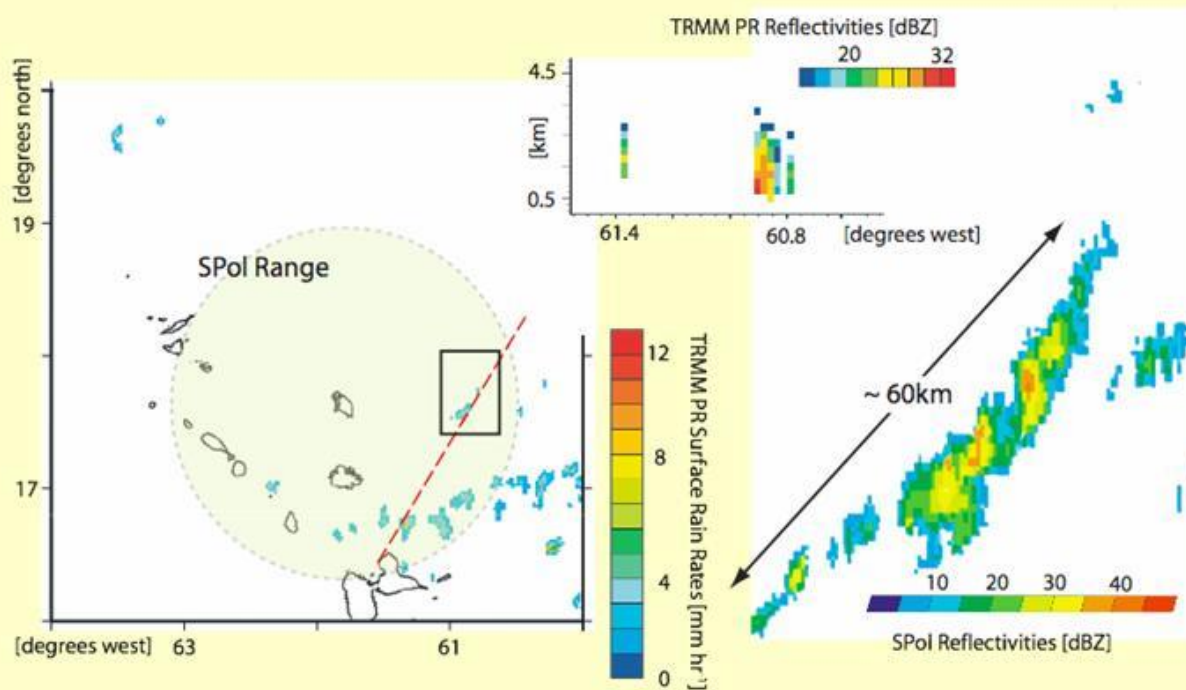
-15 -11 -7 -3 2 6 10











Rawinsonde launches

12/8 – 1/5 (twice daily)

1/5 – 1/24 (four per day)

12/9 – 12/10 (3 hourly for 24 hr)

12/16-12/17 (3 hourly for 24 hr)

Location of launch:

Spanish point on Barbuda
(except when road was
impassible due to rain – then
at SPOL)

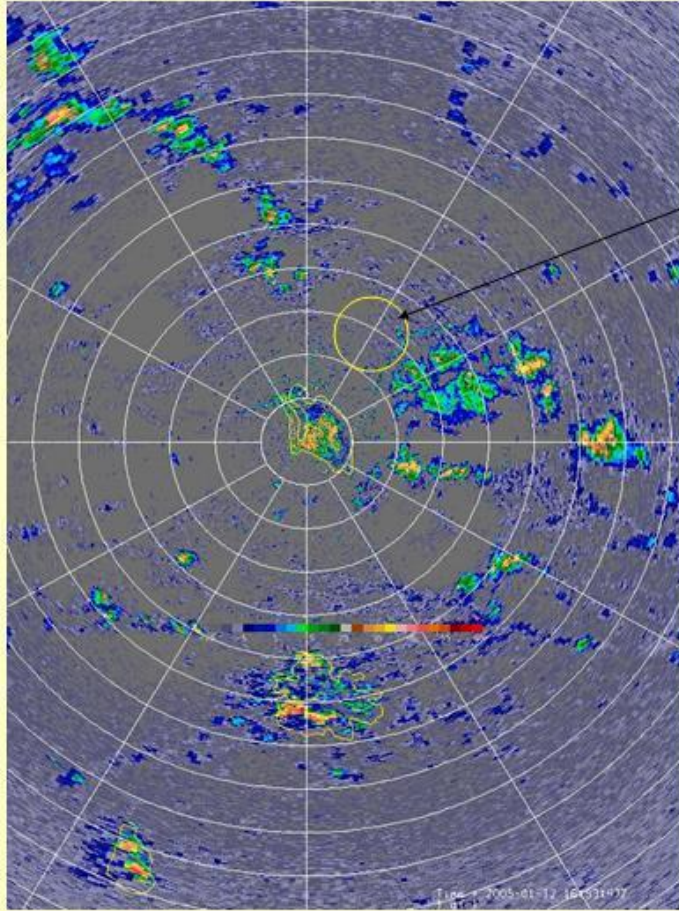


Research Ship Seward Johnson



January 9 – 14 and January 16-24

Port call on January 15



Location of SJ

Traveled upwind and
downwind about 5
miles around point



Aerosol sampling on Antigua and Puerto Rico

