

07/16/02

Obs:

Report: Two strong cells near Miami
Anvils blowing toward western ground site
Will try E-W legs as far east as we can get

FC:

Summary: Convection should develop mid-afternoon along a synoptic-scale band of enhanced lowlevel moisture convergence extending southwestward from the disturbance in the Atlantic and across Florida. This convergence band is evident in a plethora of cumulus lines and has been a persistent feature of the regional situation since very early yesterday morning. Thus, like yesterday, there should be a tendency for cells to develop parallel to this band, and propagate southwestward across the southern Florida peninsula. Overall, however, the lower atmosphere is wetter than yesterday, so multiple lines from southeast to northwest are expected to develop, as opposed to the single line of yesterday.

Aircraft: All

Log:

1558: Take-off
Start with convective header
Small cells at 25 27 N 81 07W
Work western side

1818: Tops ~ 28kft
Coming in at 10kft for first

1828: Desend to 8kft
Fly leg to east of line
See anvil and no convection
Convection was right where we took the turn
Go to west side of storms
Problems with ATC
Too far north – north of Naples

1841: Got permission for holding pattern on eastern side of storms
Citation – over Whiskey, does spiral
Western ground site (Whiskey)

1846: Flying under anvil of stuff to east at about 33kft
Not much visible – convection mostly gone

1857: Turn towards coast

1909: Parallel to coast

1912: Back on heading – 316°
Parallel to coast

1915: Nice strong cell
Tops ~ 10km

1917: Turn around

1918: Back level
Tops ~ 11km
Strong growing cell at 25 40N 80 40W
Tops ~ 12km

1930: Turn south again to work straight line suggested by NPOL
Go south of storm and then work SW/NE line

25 41N 81 25W (Delta)

1935: Turn onto line past cells
Some cells we sampled earlier

1941: Anvil ~ 14km
Several outflow anvils visible
Tops ~ 15-16km
Have to avoid stuff building

1947: Turned around because of stuff ahead of us
Could not get strongest part of convection

1955: Turn to go on north side of cells to see anvil and cells

1957: Lineup along cells again
Flying underneath anvil

2007: Tops ~ 17km
Anvils streaming NE

2009: All convection past
Turn around over Homestead

2011: Steady on return leg
Get to deep convection again
Need to move a little further north
Storms weaker in general – strong updrafts gone, few new active cells

2020: Turn around

2022: Back on track

2027: Deep convection again

2030: Turn around

2031: Back on track
Convection weaker

2041: Will try to work north side of convection

2047: Flying under anvil on north side

2050: Flying west under anvil

2058: Turn around to avoid radiosonde drop at 25 36N 81 37W

2107: Turn on eastern point

2120: Turn around

2230: ELDORA down – has been rotating to slow for an unknown period

2246: ELDORA up

2248: Back on line under anvil

2303: Break away from anvil documentation
Go to storm to north of us at Ft Myers

2321: Approaching strong cell at Ft Myers
Tops ~ 17km still

2326: Work our way towards west side of convection

2334: Flying on line next to cells
See distinct multiple layers in cloud – mostly stratiform with precipitation, no hard core, this is stage we missed on the previous storm
Flew some distance down anvil

2344: Turn back to get stage

2346: Turn completed
Anvil tops ~ 16km

2352: Turn around and go west again

2356: All convection is gone and only upper-level anvils remain

0000: Break away to go home

0013: Fly straight and level for calibration

0048: Land

Mission Reports:

- Twin Otter:** The flight was shortened due to the oil door on the left engine opening in-flight. Take-off occurred at 1752Z. The aircraft flew at 5 kft to Everglades, descended to 100 ft, vertical and spiraled up to 10 kft. It then descended below the cloud base and flew to the western ground site before the problem with oil door occurred. At that point, the Twin Otter returned to KWNAAF, and landed at 2008Z.
- WB-57F:** The aircraft took off around 1810Z, flew out west of the peninsula, and then performed a west-to-east transect across the south Florida peninsula. On take-off, the pilot had difficulty achieving the desired altitude rapidly because they were behind Proteus (which cannot ascend as quickly as the WB-57F). The aircraft got to 51 kft by the time they reached the easternmost point; the pilot and backseater reported seeing no clouds on the way out. They performed a spiral descent to approximately 49 kft and began to see clouds. They continued the descent to 40 kft and saw cirrus, below which they sampled at 39 kft. The pilot and backseater saw the aircraft's own contrail throughout this leg. There was pretty thick cirrus throughout flight between 39 kft and 44 kft. The flight crew described flying through multiple cloud layers. They performed a spiral ascent west of the Florida peninsula up to 51 kft, popped out of the clouds at 50.5 kft, and landed KWNAAF at about 2258Z. The aircraft flew through high total-water contents in relatively low cirrus, with some instruments experiencing difficulty as a result. The CAPS instrument showed symmetries in number and volume concentrations flying in and out of clouds at different altitudes, implying vertical homogeneity in sampled clouds. High ice-water content and number density were observed.
- Proteus:** The aircraft returned to base early because of a failure getting power to the FIRSC instrument. A concern about potential damage to the unheated instrument prompted an early return in order to prevent freezing the instrument.
- ER-2:** The aircraft flew a more-or-less east-west line over the peninsula between the ground sites at 65 kft. The first sonde was dropped east of the peninsula; the remaining three sondes were dropped later west of the peninsula. The pilot noted that clouds were observed to slope upwards rapidly from low levels over Miami to approximately 50 kft feet further west.
- Citation:** The aircraft launched at 1837Z and headed toward the western ground site. An orphan anvil base was visible at 27 kft. The flight crew performed a Lagrangian spiral up southwest of the western ground site to 33 kft through the anvil, down to 27 kft, and then back up to 34.5 kft. They estimated the cloud tops to be at 49 kft. They then flew a more-or-less W-E line along the winds carrying the anvils, sampling at various levels. The CPI and 2DC instruments retrieved a lot of good crystal imagery. The aircraft returned to KWNAAF at 2253Z.
- P-3:** The aircraft took off at 1500Z, and flew roughly the same line under anvils on the south side of the convection as the WB-57F and Citation. The flight level was 5 kft. The flight crew tried moving to the north side of the convection, but they were blocked by ATC. Convection was observed with ELDORA to about 17 km. At 2050Z, the aircraft moved off to the west coast and underflew an anvil system. At 2300Z, they flew to a storm system north of Ft. Myers. Cloud tops were observed to 17+ km. The aircraft made two passes under the anvil, and by then the storm had dissipated. The aircraft returned to base around 0048Z.
- Summary:** A relatively isolated convection system and its persistent anvil were sampled extensively on this flight. This case should be useful for modeling studies. Sea-breeze convection kicked off on the east peninsula around 1600Z and developed a fast-moving anvil that traversed west rapidly over the western ground site by around 1830Z. Afternoon isolated Cbs in south central Florida began around 1930Z. A cirrus deck developed and moved west, and was sampled extensively by the WB-57F and Citation. The P-3 made measurements of the same line as the other planes on the south side of the convective activity.

Flight Path & Focus: 171730 245304, rf05

Line 1: 184930 193540 NW-SE orientation, along west coast of south Florida south side of line sea-breeze convection-anvil system, anvils over western ground site convection

coordination w/Citation WB-57F

Quality: Ok/Bad – not much

Part 1: 184930 193540 not much visible
convection mostly gone
no anvil present

leg_1.1.1: 184930 185650 not too much detectable
leg_1.1.2: 185730 190300 nothing
leg_1.1.3: 190330 191110
leg_1.1.4: 191140 191720 low tops, some convection starting
leg_1.1.5: 191740 192420 strong core
leg_1.1.6: 192450 193010 strong core
leg_1.1.7: 193030 193540

Line 2: 200150 230400 E-W orientation, south Florida near west coast
convection-anvil system
no coordination

some previous sampled stuff

Quality: Good – nice anvil

Part 1: 200150 204050 E-W orientation
convection

leg_2.1.1: 200150 201010 higher tops from Line 1
leg_2.1.2: 201040 202110 a little outflow
leg_2.1.3: 202120 203010 hard core
leg_2.1.4: 203020 204050 hard core

Part 2: 204920 230400 E-W orientation, move north
anvil
shorter legs

anvil at parts and anvil plus convection at other parts

leg_2.2.1: 204930 205720 nice anvil
leg_2.2.2: 205750 210810 some convection under anvil
leg_2.2.3: 210830 211840
leg_2.2.4: 211910 212930 lengthen legs between 4-5 - move to avoid dropsonde
leg_2.2.5: 213000 215430 anvil detached, flying under anvil
leg_2.2.6: 215500 221600 nothing at west end – end lengthened to
leg_2.2.7: 221630 223230 mammatus, ELDORA down
leg_2.2.8: 223300 224700 ELDORA down
leg_2.2.9: 224730 230400 convection gone

Line 3: 233520 240000 Ft Myers area, SWW-NEE orientation
convection-anvil system
no coordination

Quality: Excellent

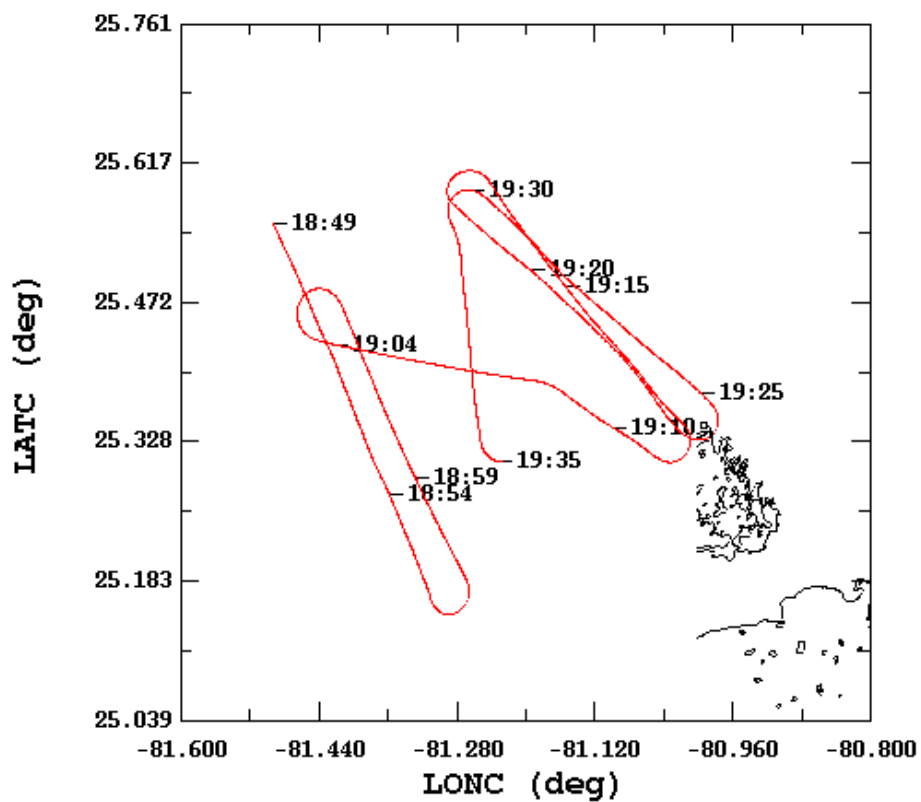
Part 1: 233520 240000 very nice
layered clouds

leg_3.1.1: 233520 234500 strong convection, outflow at top both sides
leg_3.1.2: 234530 235130
leg_3.1.3: 235140 240000 anvil detached

0716 Line 1

CRYSTAL-FACE, Flight #rf05

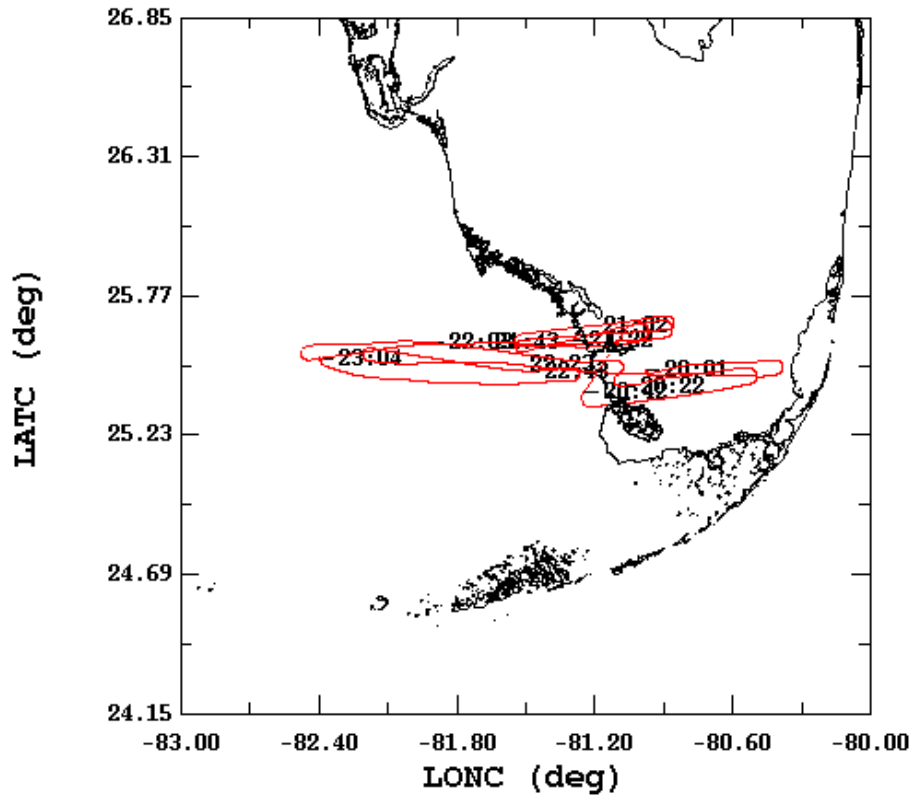
07/16/2002, 18:49:30-19:35:40



	mean	sigma	min	max
— LATC (deg), 1 s/sec	25.41	0.11	25.15	25.61
— LONC (deg), 1 s/sec	-81.24	0.13	-81.49	-80.98

CRYSTAL-FACE, Flight #rf05

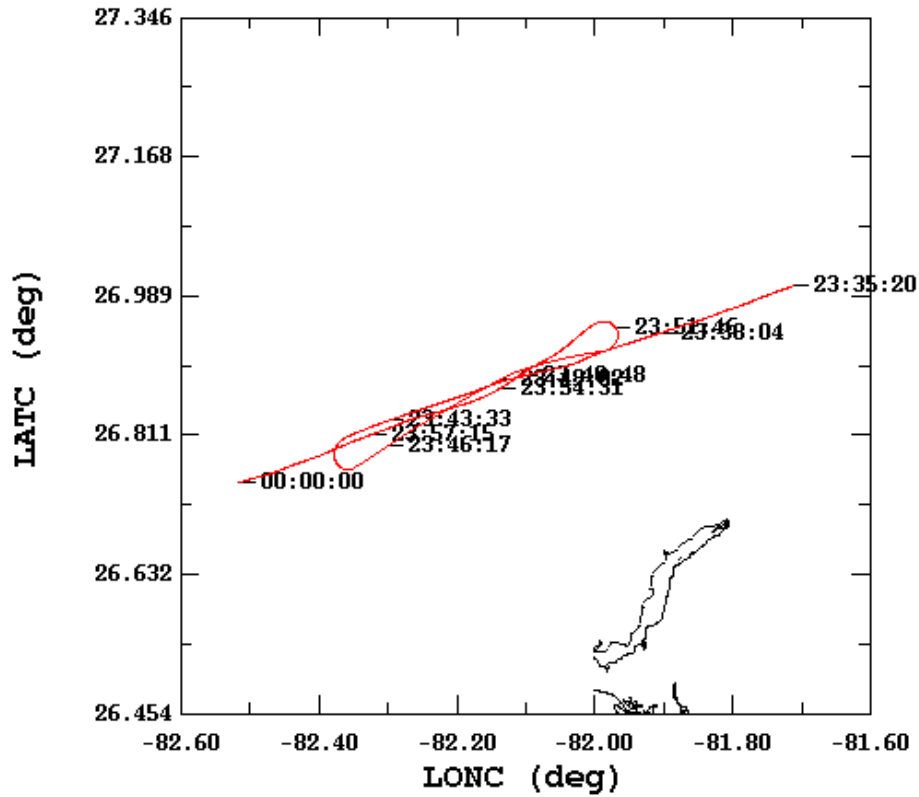
07/16/2002, 20:01:50-23:04:00



	mean	sigma	min	max
— LATC (deg), 1 s/sec	25.53	0.08	25.34	25.69
— LONC (deg), 1 s/sec	-81.38	0.50	-82.47	-80.38

CRYSTAL-FACE, Flight #rf05

07/16/2002, 23:35:20-24:00:00



	mean	sigma	min	max
— LATC (deg), 1 s/sec	26.87	0.06	26.75	27.00
— LONC (deg), 1 s/sec	-82.15	0.19	-82.52	-81.71