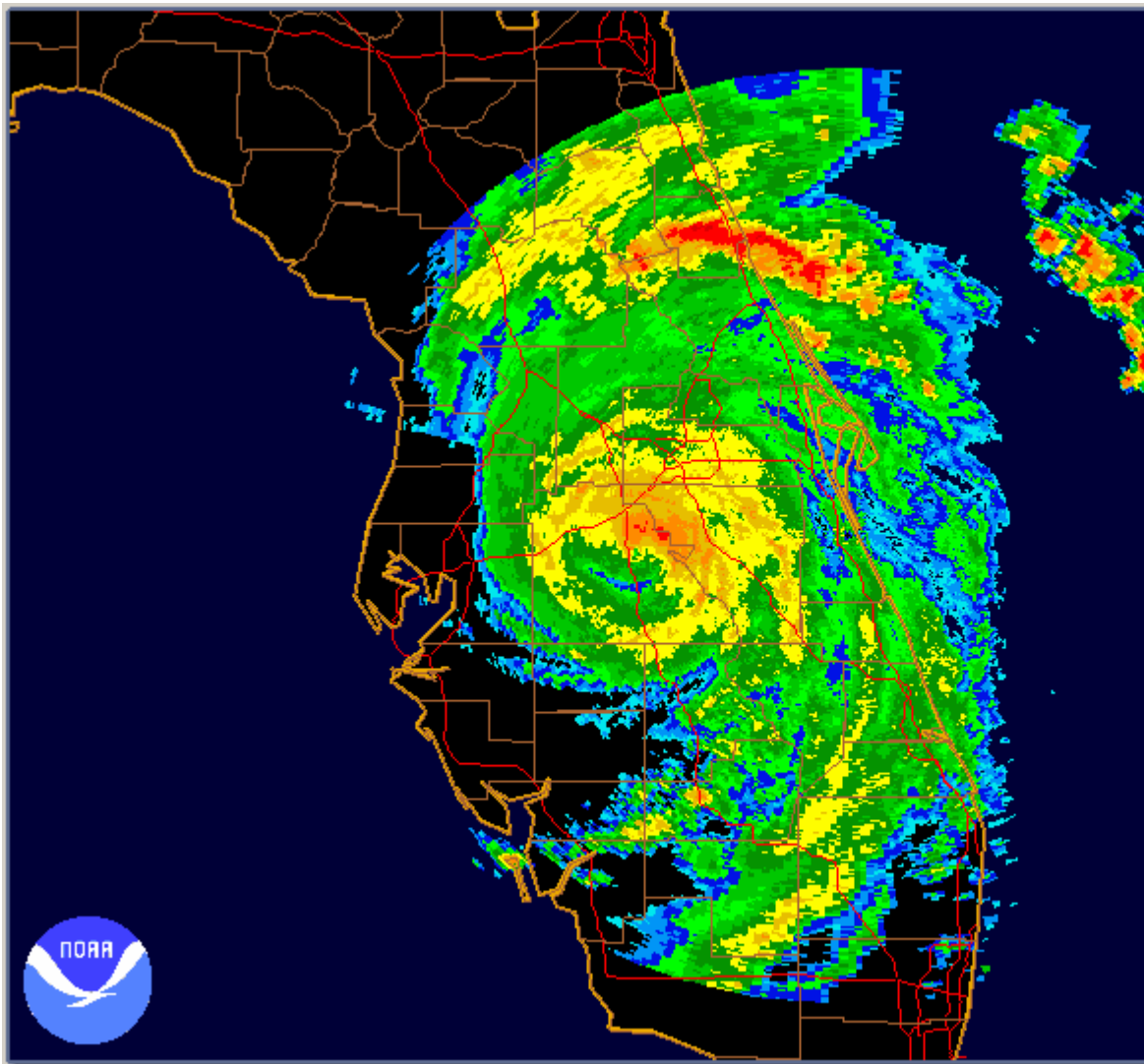


# Hurricane Charley

August 13, 2004

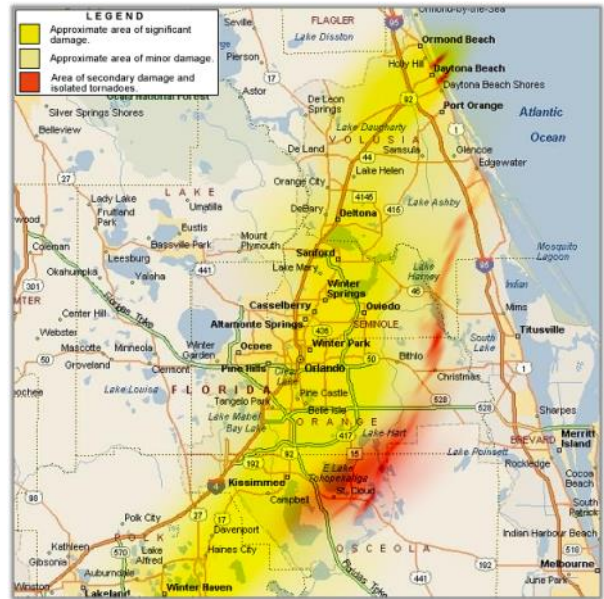
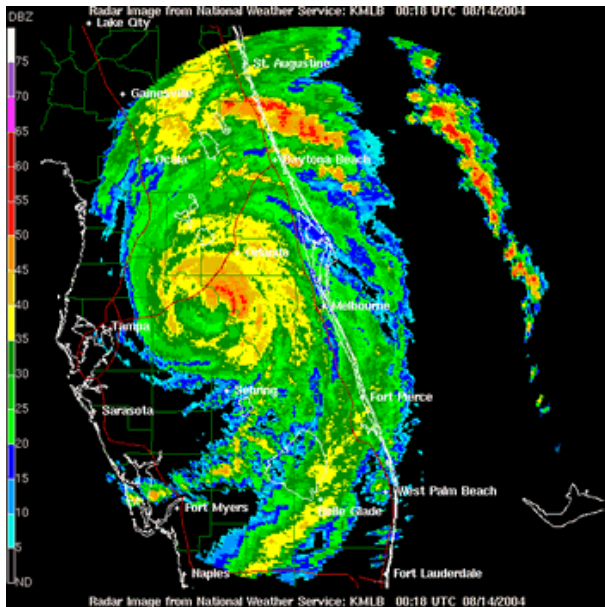
[National Hurricane Summary of Hurricane Charley \(pdf\)](#)



NEXRAD LEVEL-III  
BASE REFLECTIVITY  
KMLB - MELBOURNE, FL  
08/14/2004 00:01:52 GMT  
LAT: 28/06/46 N  
LON: 80/39/14 W  
ELEV: 116 FT  
MODE/VCP: A / 12  
ELEV ANGLE: 0.50 °  
MAX: 57 dBZ

Legend: dBZ (Category)

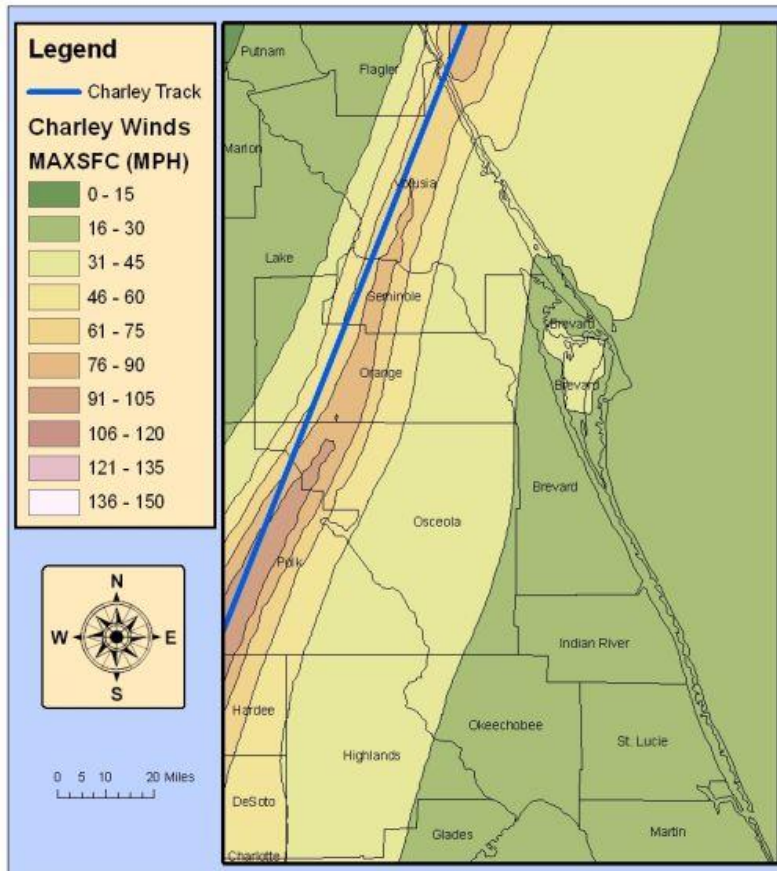
75	(15)
70	(14)
65	(13)
60	(12)
55	(11)
50	(10)
45	(9)
40	(8)
35	(7)
30	(6)
25	(5)
20	(4)
15	(3)
10	(2)
5	(1)



Radar Image of Charley Entering East Central Florida

Approximate Path of Charley through east central Florida.

Charley Winds from HRD MAXSFC (MPH)



Maximum Winds From Hurricane Charley (from Hurricane Research Division)

# Damage Photos

## Osceola



# Orange







## Seminole





# Volusia









## Brevard

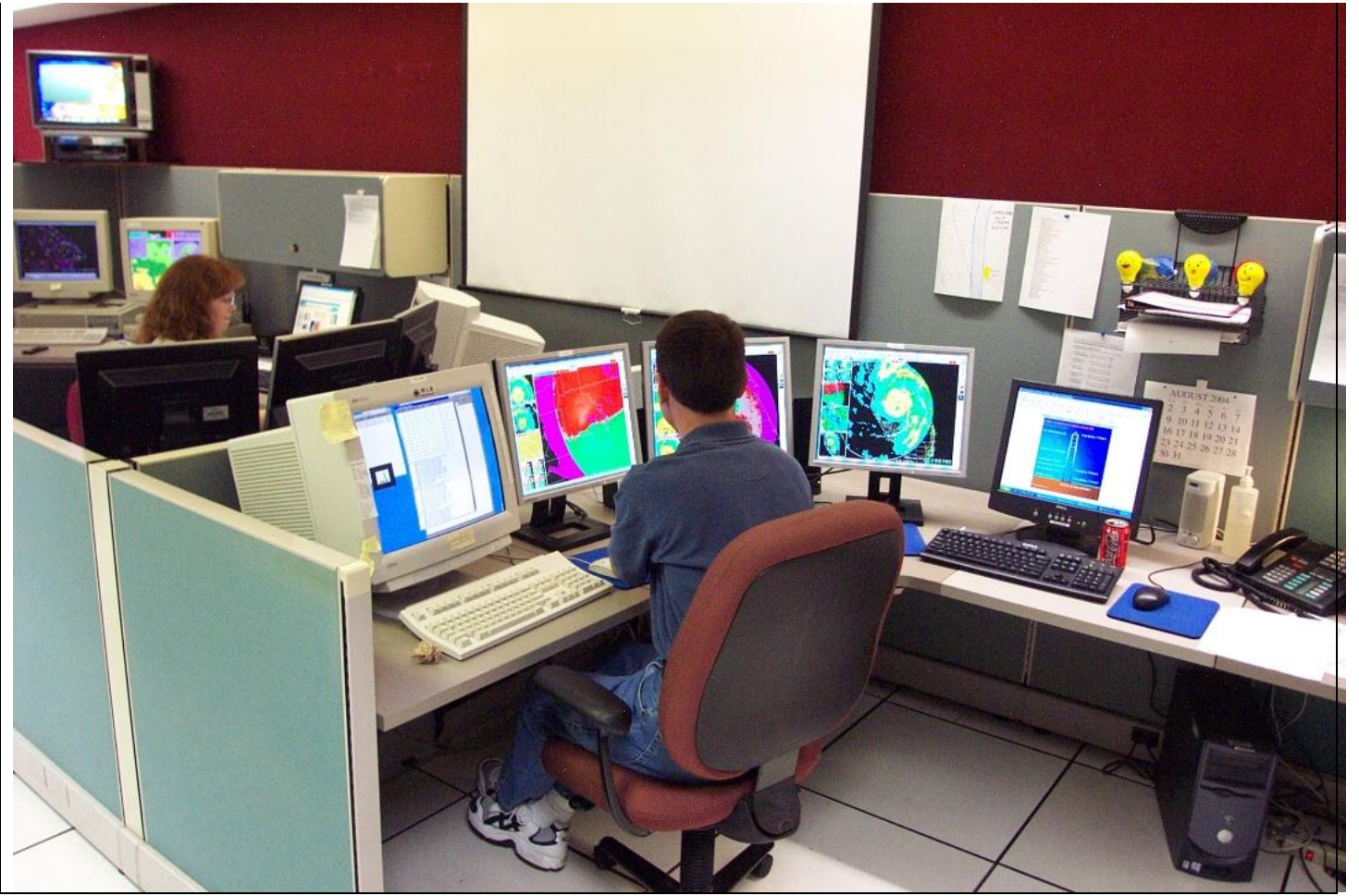


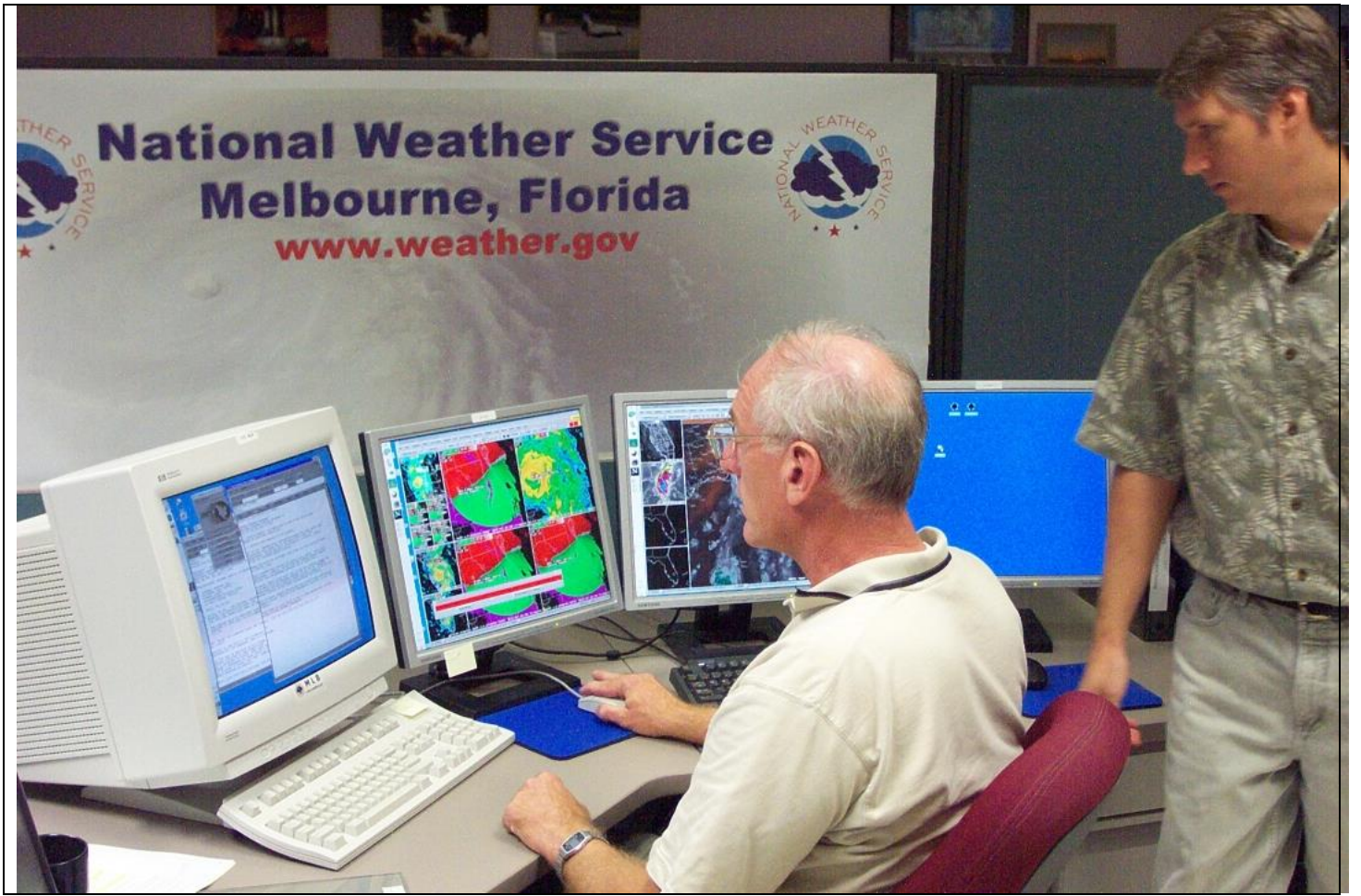


# Operations Floor Photographs

August 13, 2004











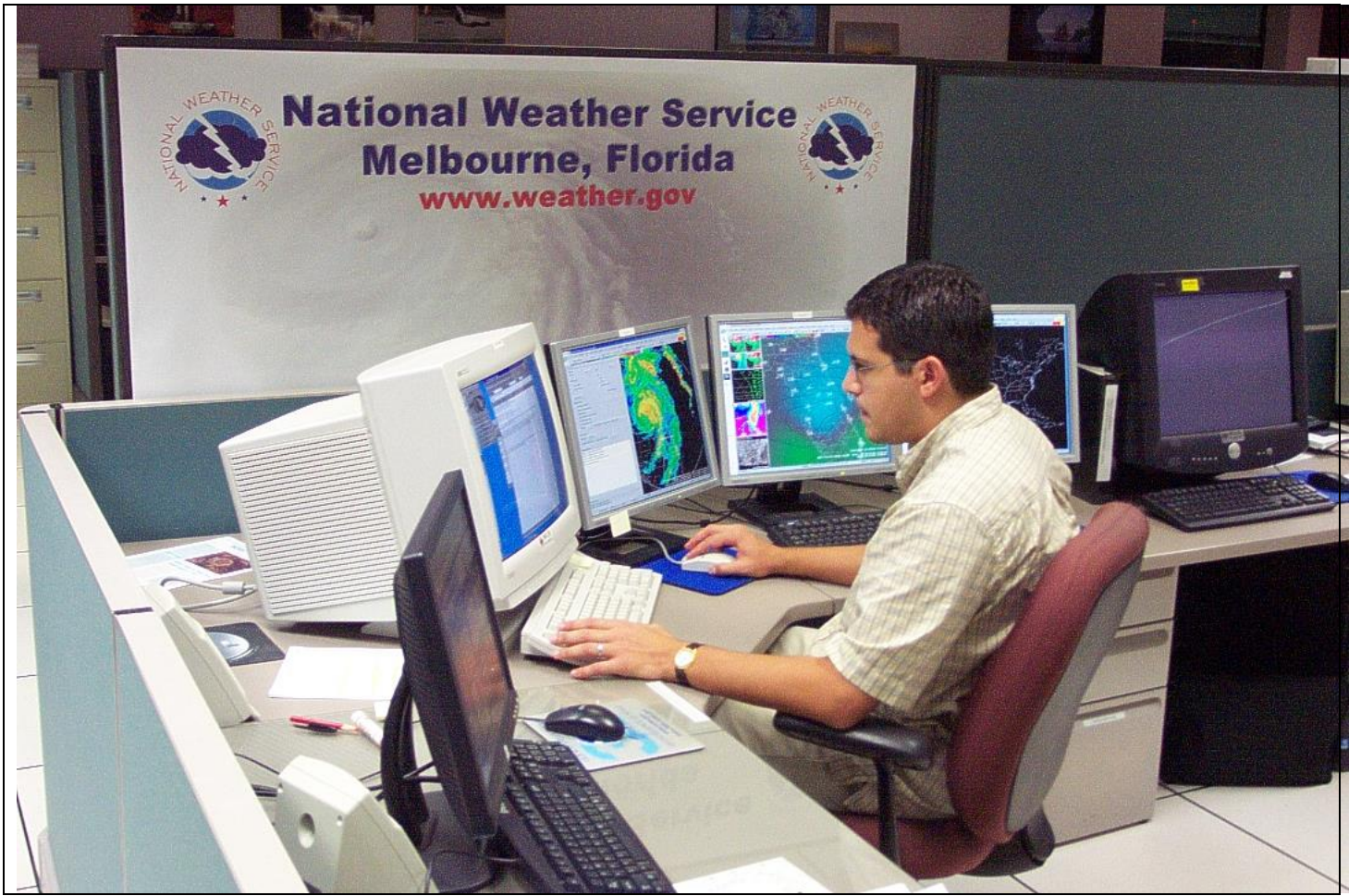






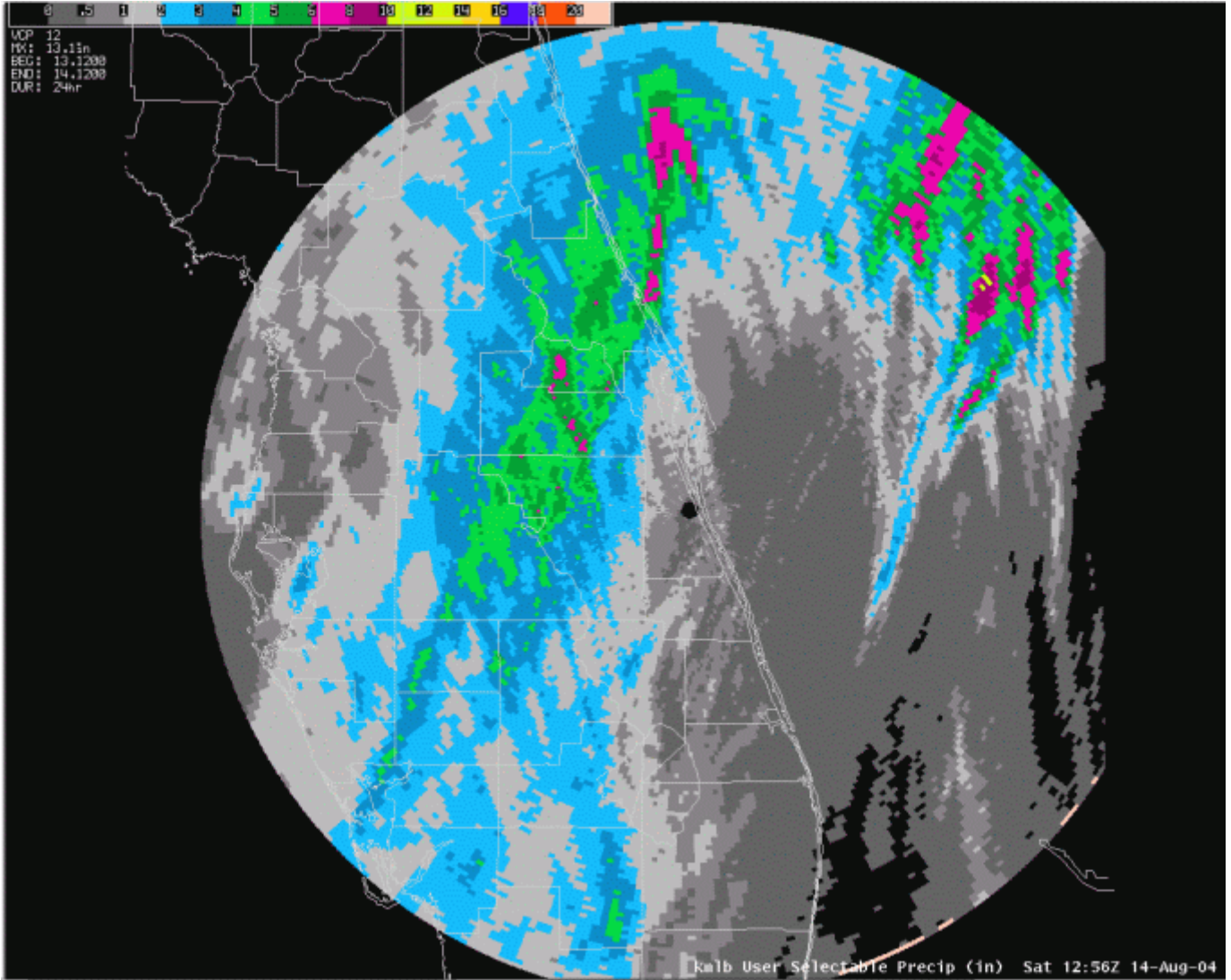




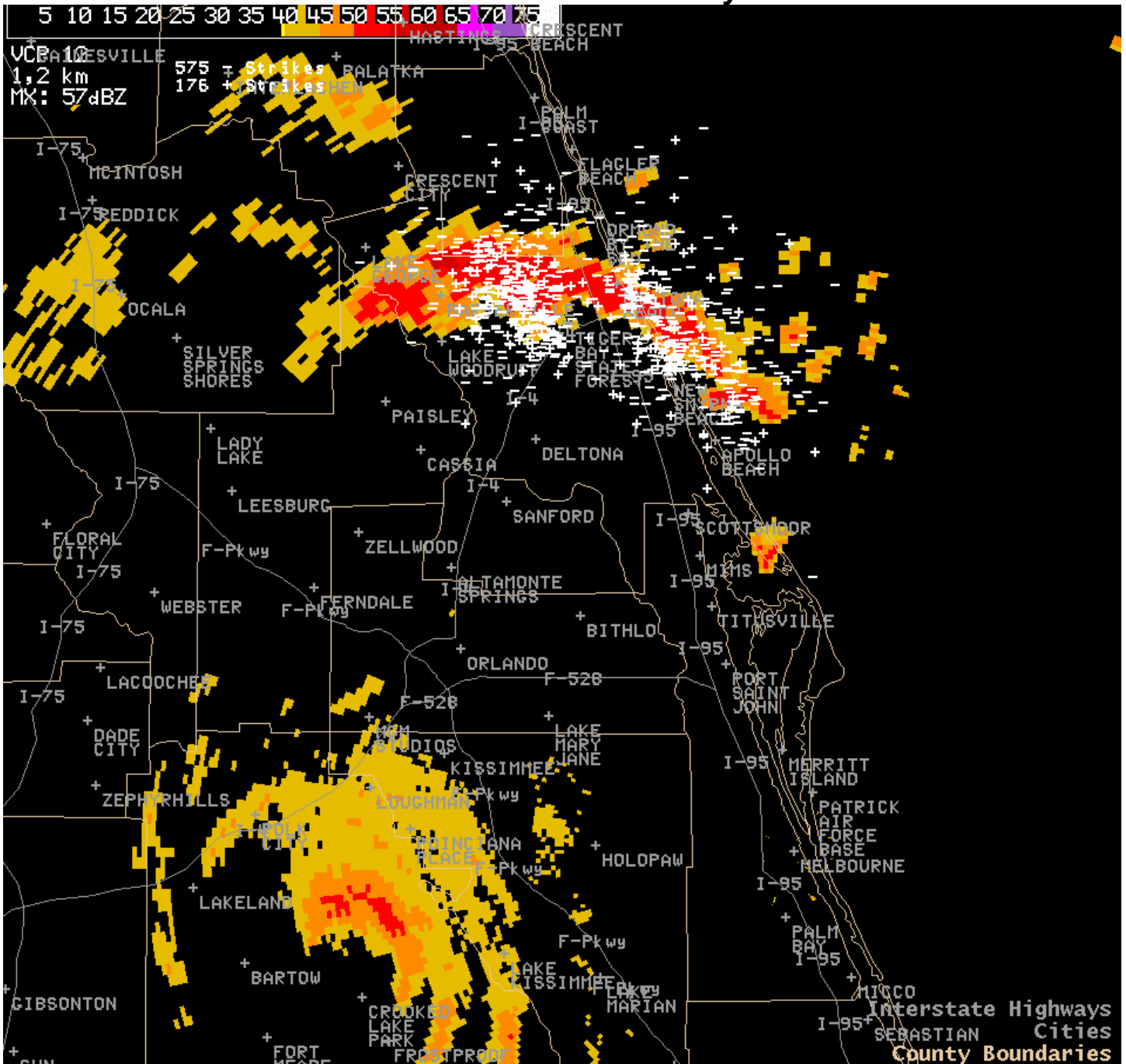




# Hurricane Charley Doppler Radar Rainfall Estimate



## Tornadoes and Lightning Associated With Hurricane Charley

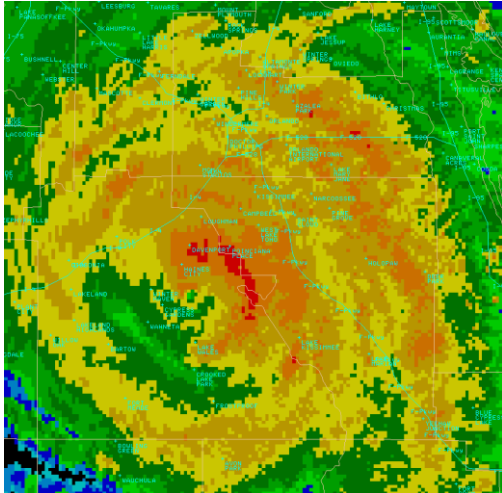


As the eye of Charley was just about to enter Osceola County all of the lightning activity was located in a very strong outer rainband over northern Volusia County. These outer rainbands typically produce the strongest tornadoes and around 7:30-4:45 pm Friday the most significant tornado associated with Charley in central Florida struck portions of Daytona Beach.

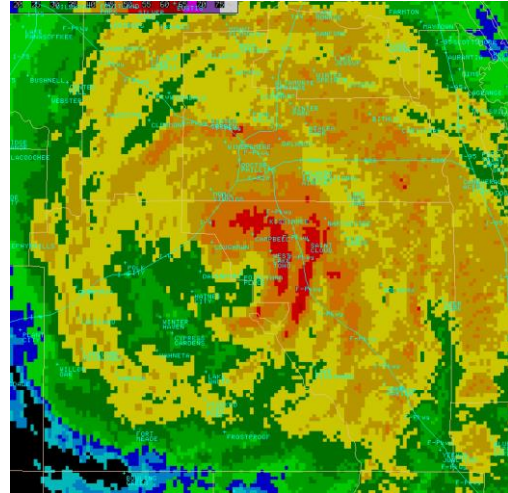


## Timeline of Hurricane Charley Radar Images

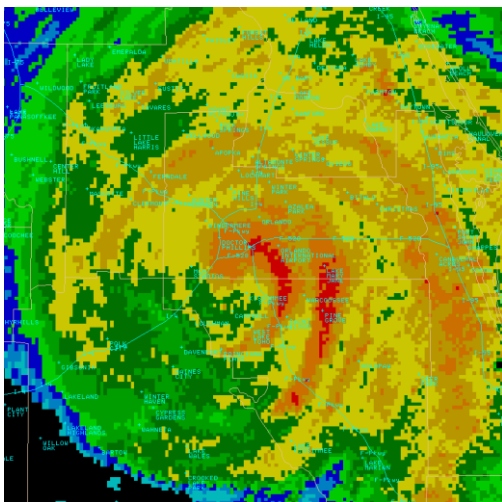
The following are composite reflectivity images from National Weather Service Melbourne NEXRAD Radar. The highest winds and worst damage occurred in the right-front quadrant of Charley's eyewall which is generally indicated by the bright red semi-circle in the images.



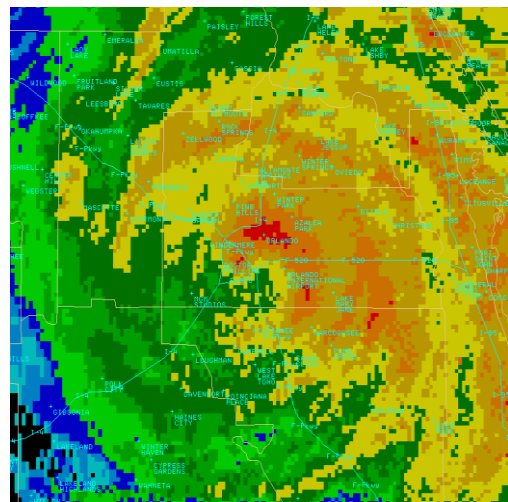
Entering Osceola County - 8:01 pm Fri



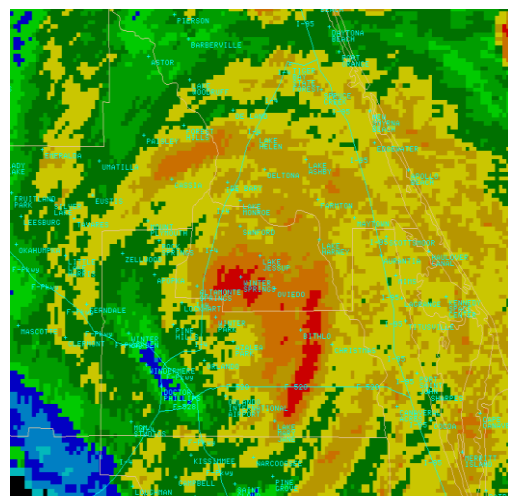
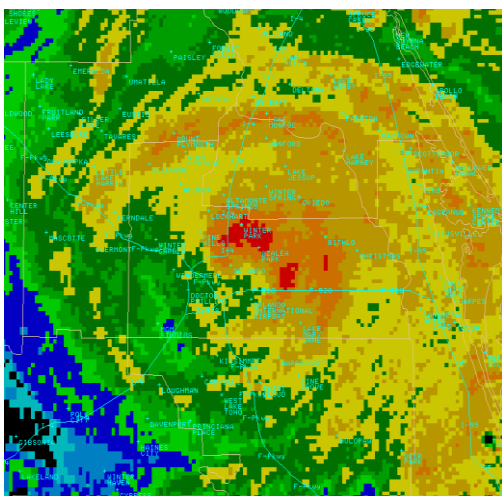
Over Kissimmee - 8:27 pm Fri



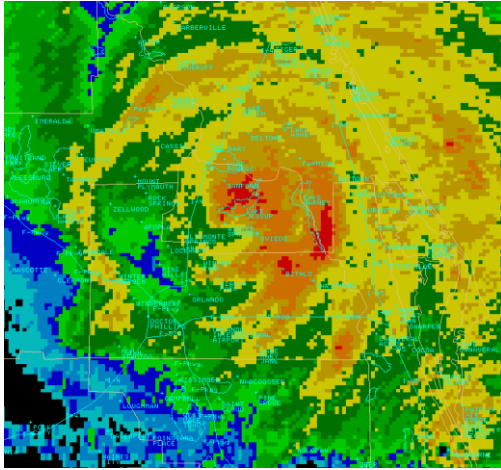
Orlando International Airport - 8:52 pm



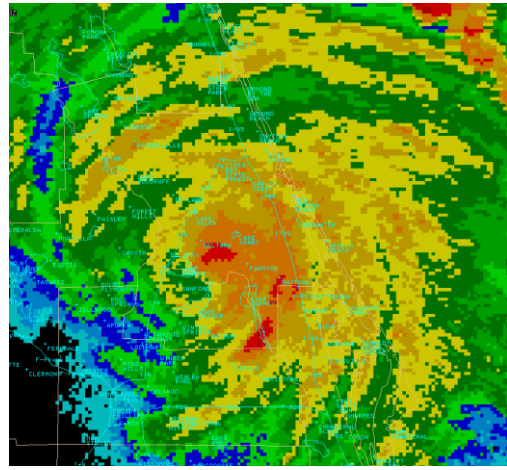
Orlando - 9:09 pm



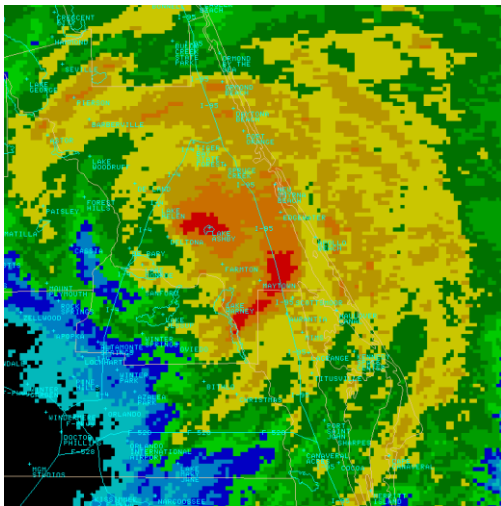
Winter Park - 9:22 pm



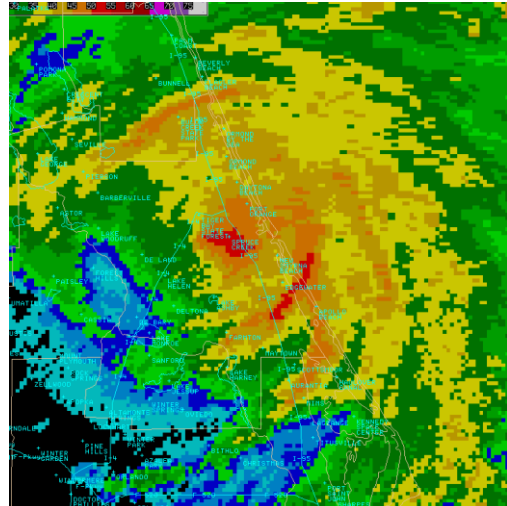
Winter Springs - 9:39 pm



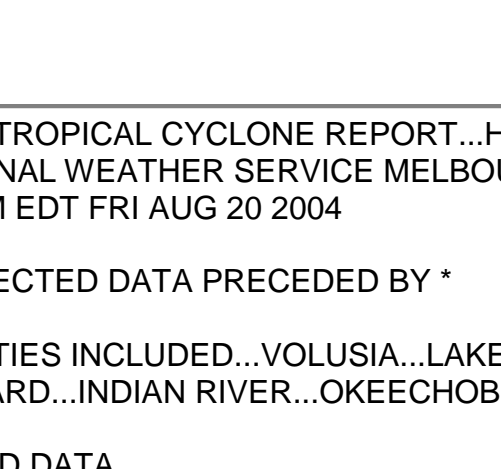
Sanford - 9:56 pm



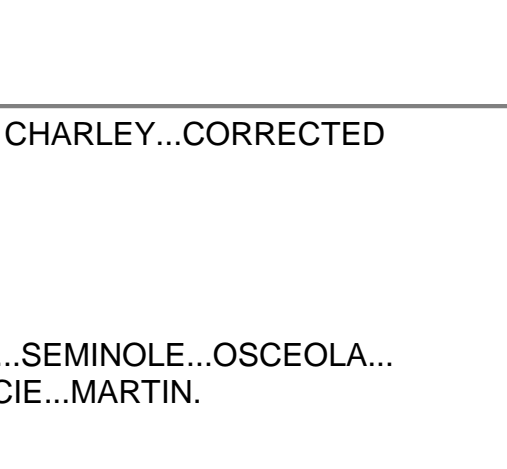
Deltona - 10:17 pm



Lake Ashby - 10:29 pm



Edgewater - 10:51 pm



POST TROPICAL CYCLONE REPORT...HURRICANE CHARLEY...CORRECTED  
 NATIONAL WEATHER SERVICE MELBOURNE FL  
 938 PM EDT FRI AUG 20 2004

CORRECTED DATA PRECEDED BY \*

COUNTIES INCLUDED...VOLUSIA...LAKE...ORANGE...SEMINOLE...OSCEOLA...  
 BREVARD...INDIAN RIVER...OKEECHOBEE...ST. LUCIE...MARTIN.

A. WIND DATA

ASOS/AWOS...SUSTAINED WINDS (2-MINUTE AVERAGE)

COUNTY.....CITY (SID).....DIR/SPD (KT)...DATE/TIME (UTC)  
 OSCEOLA.....KISSIMMEE (ISM).....MSG/53.....08/14/04..0035Z  
 ORANGE.....ORLANDO (MCO).....160/67.....08/14/04..0105Z  
 ORANGE.....ORLANDO (ORL).....130/57.....08/14/04..0129Z

\*SEMINOLE.....SANFORD (SFB).....120/63.....08/14/04..0210Z  
LAKE.....LEESBURG (LEE).....020/29.....08/14/04..0135Z  
ST LUCIE.....FT PIERCE (FPR).....140/21.....08/13/04..1910Z  
MARTIN.....STUART (SUA).....170/20.....08/13/04..1955Z  
INDIAN RIVER..VERO BEACH (VRB).....180/23.....08/14/04..0136Z  
BREVARD.....MELBOURNE (MLB).....180/29.....08/14/04..0056Z  
BREVARD.....PATRICK AFB (COF)....150/28.....08/14/04..0044Z  
VOLUSIA.....DAYTONA BEACH (DAB)..200/48.....08/14/04..0353Z  
VOLUSIA.....ORMOND BEACH (OMN)...100/59.....08/14/04..0315Z

ASOS/AWOS...PEAK GUSTS

COUNTY.....CITY (SID).....DIR/SPD (KT)...DATE/TIME (UTC)  
OSCEOLA.....KISSIMMEE (ISM).....MSG/65.....08/14/04..0035Z  
ORANGE.....ORLANDO(MCO).....160/91.....08/14/04..0105Z  
ORANGE.....ORLANDO (ORL).....120/74.....08/14/04..0129Z  
SEMINOLE.....SANFORD (SFB).....120/80.....08/14/04..0210Z  
LAKE.....LEESBURG (LEE).....020/34.....08/14/04..0134Z  
ST LUCIE.....FT PIERCE (FPR).....170/26.....08/14/04..0113Z  
MARTIN.....STUART (SUA).....170/31.....08/13/04..2055Z  
INDIAN RIVER..VERO BEACH (VRB).....180/30.....08/14/04..0115Z  
BREVARD.....MELBOURNE (MLB).....180/39.....08/14/04..0222Z  
BREVARD.....PATRICK AFB (COF)....150/43.....08/14/04..0044Z  
VOLUSIA.....DAYTONA BEACH (DAB)..200/72.....08/14/04..0353Z  
VOLUSIA.....ORMOND BEACH (OMN)...100/76.....08/14/04..0315Z

NOTE: ASOS SITES MCO, ORL, SFB, AND DAB FAILED DURING THE HEIGHT OF THE STORM AND NOT ALL DATA IS COMPLETE. KISSIMMEE AWOS ALSO FAILED. VALUES ABOVE ARE THE HIGHEST FOUND.

NASA WIND TOWER (ELEVATED) WINDS

CAPE CANAVERAL (BREVARD COUNTY) AIR FORCE STATION MESONET TOWERS

TOWER 421 (28.7755N 80.8043W AT 54 FEET AGL)  
HIGHEST SUSTAINED (DIR/SPD) 151/56 (KT) AT 08/14/04...0250Z  
HIGHEST PEAK (DIR/SPD) 156/75 (KT) AT 08/14/04...0255Z

TOWER 22 (28.7975N 80.8043W AT 54 FEET AGL)  
HIGHEST SUSTAINED (DIR/SPD) 156/53 (KT) AT 08/14/04...0250Z  
HIGHEST PEAK (DIR/SPD) 165/75 (KT) AT 08/14/04...0310Z

DAYTONA BEACH INTERNATIONAL AIRPORT (VOLUSIA COUNTY)  
WIND SHEAR ALERT SYSTEM (110-150 FEET AGL)  
MAXIMUM GUST OF 84 KT (NO DIRECTION).....AT 08/14/04...0325Z

MARINE BUOYS MAXIMUM GUSTS

42009.....20 E PORT CANAVERAL.....180/44...08/14/04...0150Z  
42010.....120 E NEW SMYRNA BEACH....170/15...08/14/04...0920Z

ADDITIONAL WIND OBSERVATIONS (UNOFFICIAL)

SOUTH FLORIDA WATER MANAGEMENT DISTRICT MAXIMUM WIND

\*(OVER LAKE/RIVER SITES-ANEMOMETER HEIGHT 33FT, EXCEPT 28FT FOR L001)

LOCATION.....DIR/SPD (KT)...DATE/TIME (UTC)  
S61W (28.14N 81.35W).....144/78.....08/14/04...0028Z  
S65CW (27.40N 81.11W).....155/50.....08/13/04...2242Z  
S65DWX (27.31N 81.02W).....163/50.....08/13/04...2216Z  
L001 (27.14N 80.79W).....178/46.....08/13/04...2234Z

SEMINOLE COUNTY MESONET STATIONS MAXIMUM WIND (10-MINUTE AVERAGE)

LOCATION.....DIR/SPD (KT)....DATE/TIME (UTC)  
STN 16 (28.701N 82.417W)...NORTH/35.....08/14/04...0145Z  
STN 22 (28.655N 82.347W)...NORTHEAST/57.....08/14/04...0145Z  
STN 35 (28.742N 82.300W)...NORTHEAST/43.....08/14/04...0145Z  
STN CSB (28.810N 82.255W)...SOUTHEAST/29.....08/14/04...0130Z

FLORIDA AUTOMATED WEATHER NETWORK (FAWN) MAXIMUM SUSTAINED WIND  
ANEMOMETER HEIGHT 30 FEET; AVERAGING PERIOD UNKNOWN

COUNTY.....CITY.....DIR/SPD (KT)...DATE/TIME (UTC)  
ORANGE.....APOPKA.....353/30.....08/14/04...0045Z  
OSCEOLA.....KENANSVILLE...152/23.....08/13/04...2315Z  
LAKE.....OKAHUMPKA.....314/19.....08/14/04...0130Z  
VOLUSIA.....PIERSON.....021/13.....08/14/04...0200Z  
ST LUCIE.....FT PIERCE.....186/19.....08/14/04...0100Z  
LAKE.....UMATILLA.....014/19.....08/14/04...0115Z  
LAKE.....TAVARES.....262/10.....08/14/04...0315Z

AUTOMATIC POSITION REPORTING SYSTEM (APRS)...PEAK GUSTS

COUNTY....ID.....CITY.....DIR/SPD(KT)..DATE/TIME (UTC)  
OSCEOLA...N4ZIQ...ST CLOUD.....100/62.....08/14/04...0021Z  
ORANGE...WA4LZC...ORLANDO.....169/45.....08/14/04...0119Z  
ORANGE...KB2RC...ORLANDO.....164/70.....08/14/04...0212Z  
BREVARD...CW0587...MERRITT ISL....199/44.....08/14/04...0159Z  
LAKE.....CW1921...CLERMONT.....302/40.....08/14/04...0200Z

BREVARD COUNTY FIRE STATIONS...SUSTAINED WIND AND PEAK GUSTS

CITY.....SUSTAINED (KT)...GUST (KT)  
SATELLITE BEACH.....MSG.....37  
COCOA.....MSG.....45  
CENTRAL MERRITT ISLAND...MSG.....49  
PORT ST. JOHN.....47.....68

B. PRESSURE DATA

ASOS/AWOS...LOWEST MEAN SEA LEVEL PRESSURE

COUNTY.....CITY.....PRES/MB....DATE/TIME (UTC)  
ORANGE.....ORLANDO (MCO).....984.2.....08/14/04...0139Z  
ORANGE.....ORLANDO (ORL).....980.7.....08/14/04...0129Z

SEMINOLE.....SANFORD (SFB).....983.4.....08/14/04...0213Z  
LAKE.....LEESBURG (LEE).....1005.1.....08/14/04...0158Z  
ST LUCIE.....FT PIERCE (FPR).....1011.5.....08/13/04...1939Z  
INDIAN RIVER..VERO BEACH (VRB).....1011.5.....08/13/04...2011Z  
BREVARD.....MELBOURNE (MLB).....1010.5.....08/14/04...0100Z  
BREVARD.....KSC (TTS).....NOT AVAILABLE  
VOLUSIA.....DAYTONA BEACH (DAB)..NOT AVAILABLE  
VOLUSIA.....ORMOND BEACH (OMN)...NOT AVAILABLE

NASA MESONET WIND TOWER 3131 (BREVARD COUNTY)  
PRES/MB.....DATE/TIME (UTC)  
1007.7.....8/14/2004..0240Z

ADDITIONAL PRESSURE DATA (UNOFFICIAL)

SOUTH FLORIDA WATER MANAGEMENT DISTRICT LOWEST PRESSURE  
(OVER LAKE/RIVER SITES)

LOCATION.....PRESS (MB)....DATE/TIME..(UTC)  
S61W (28.14N 81.35W).....990.7.....08/14/04...0028Z  
S65CW (27.40N 81.11W).....1006.8.....08/13/04...2245Z  
S65DWX (27.31N 81.02W).....1008.2.....08/13/04...2215Z  
L001 (27.14N 80.79W).....1010.9.....08/13/04...2045Z

SEMINOLE COUNTY MESONET STATIONS...LOWEST PRESSURE

LOCATION.....PRESS (MB)....DATE/TIME..(UTC)  
STN 16 (28.701N 82.417W)....990.2.....08/14/04...0200Z  
STN 22 (28.655N 82.347W)....982.1.....08/14/04...0145Z  
STN 35 (28.742N 82.300W)....984.1.....08/14/04...0200Z  
STN CSB (28.810N 82.255W)....985.1.....08/14/04...0130Z

AUTOMATIC POSITION REPORTING SYSTEM (APRS)

COUNTY....ID.....CITY.....PRES (MB)....DATE/TIME (UTC)  
OSCEOLA...N4ZIQ...ST CLOUD.....1000.1.....08/14/04...0021Z  
ORANGE...WA4LZC...ORLANDO.....991.4.....08/14/04...0119Z  
ORANGE...KB2RC...ORLANDO.....997.4.....08/14/04...0212Z  
BREVARD...CW0587...MERRITT ISL....1008.3.....08/14/04...0159Z  
LAKE.....CW1921...CLERMONT.....1005.5.....08/14/04...0200Z

C. STORM TOTAL RAINFALL

RADAR RAINFALL ESTIMATES OF 3 TO 6 INCHES FROM NORTHWEST OSCEOLA  
COUNTY ACROSS CENTRAL ORANGE COUNTY AND SEMINOLE AND VOLUSIA  
COUNTIES. ISOLATED ESTIMATES OF 6 TO 8 INCHES...PRIMARILY IN ORANGE  
AND SEMINOLE COUNTIES.

ASOS/COOP RAINFALL 1200 UTC 08/12/2004 - 1200 UTC 08/14/2004

COUNTY.....LOCATION.....TOTAL RAINFALL (IN)  
OKEECHOBEE.....OKEECHOBEE COOP.....1.97

OSCEOLA.....KISSIMMEE.....5.20  
 ORANGE.....ORLANDO INTL.....2.11  
 ORANGE.....ORLANDO EXEC.....2.37  
 ORANGE.....PLYMOUTH COOP.....4.34  
 SEMINOLE.....SANFORD ARPT.....3.49  
 SEMINOLE.....SANFORD COOP.....5.55  
 LAKE.....CLERMONT COOP.....4.17  
 LAKE.....LEESBURG ARPT.....0.94  
 BREVARD.....MELBOURNE ARPT.....1.44  
 BREVARD.....MELBOURNE NWS.....1.17  
 BREVARD.....PALM BAY COOP.....1.27  
 BREVARD.....TITUSVILLE COOP.....1.38  
 INDIAN RIVER...VERO BEACH ARPT.....0.94  
 INDIAN RIVER...VERO BEACH COOP.....1.16  
 VOLUSIA.....PONCE INLET COOP...2.63  
 VOLUSIA.....DELAND COOP.....2.25  
 VOLUSIA.....DAYTONA BEACH ARPT..3.43  
 ST LUCIE.....NETTLES ISL COOP...0.86  
 ST LUCIE.....FT PIERCE ARPT.....0.40  
 ST LUCIE.....FT PIERCE COOP.....0.74  
 MARTIN.....PORT SALERNO COOP...0.46

ADDITIONAL WIND OBSERVATIONS (UNOFFICIAL)

SEMINOLE COUNTY MESONET STATIONS (24 HR BEGINNING 0400 UTC 08/13/04)

LOCATION.....RAINFALL (IN)  
 STN 16 (28.701N 82.417W)....3.00  
 STN 22 (28.655N 82.347W)....3.73  
 STN 35 (28.742N 82.300W)....3.85  
 STN CSB (28.810N 82.255W)....3.06

FLORIDA AUTOMATED WEATHER NETWORK (FAWN)  
 (24 HR BEGINNING 0400 UTC 08/13/04)

COUNTY.....CITY.....RAINFALL (IN)  
 ORANGE.....APOPKA.....4.02  
 ORANGE.....AVALON.....3.14  
 OSCEOLA.....KENANSVILLE...1.40  
 LAKE.....OKAHUMPKA.....0.96  
 VOLUSIA.....PIERSON.....3.67  
 ST LUCIE.....FT PIERCE.....0.18  
 LAKE.....UMATILLA.....3.02  
 LAKE.....TAVARES.....1.97

D. STORM TIDES AND HEIGHTS...NONE

E. BEACH EROSION

NO SIGNIFICANT BEACH EROSION REPORTED. SOME MINOR BEACH EROSION MAY HAVE OCCURRED IN NORTHERN VOLUSIA COUNTY AS HURRICANE CHARLEY MOVED OFFSHORE AND A DAMAGING EASTERLY WIND IMPACTED THE ORMOND BEACH

AREA.

#### F. FLOODING

MINOR FLOODING WAS REPORTED IN NORTHWEST OSCEOLA...ORANGE... SEMINOLE AND VOLUSIA COUNTIES. WATER REMAINED STANDING IN SOME LOW-LYING AND POOR DRAINAGE AREAS ON SATURDAY THE 14TH. NO SPECIFIC REPORTS OF DAMAGE DUE TO FLASH FLOODING.

#### G. TORNADOES

OSCEOLA COUNTY 08/13/2004 2111Z...AN F0 TORNADO TOUCHED DOWN BRIEFLY IN THE HARMONY COMMUNITY EAST OF ST. CLOUD ON HIGHWAY 192. ACCORDING TO AN EYEWITNESS TREES WERE BLOWN DOWN ALONG THE MAIN STREET. FUNNEL CLOUDS WERE ALSO REPORTED IN THE AREA.

VOLUSIA COUNTY 08/13/2004 2326Z...AN F1 TORNADO OCCURRED IN SOUTH DAYTONA BEACH AS THE PRIMARY RAINBAND AHEAD OF HURRICANE CHARLEY SWEEPED ACROSS THE AREA. THE TORNADO TOUCHED DOWN SOUTHEAST OF BEVILLE ROAD AND US HIGHWAY ONE. IT PRODUCED A QUARTER MILE LONG TRACK... DESTROYING ONE HOME. THREE OTHER HOUSES RECEIVED MAJOR DAMAGE AND 5 MINOR DAMAGE ...MANY DUE TO FALLEN TREES IN THE AREA. THE ROOF WAS TORN OFF A STRIP MALL STORE AND A PETROLEUM FIRE WAS STARTED WHEN THE TORNADO DESTROYED TWO GAS PUMPS AND THE CANOPY OVER A GAS STATION.

VOLUSIA COUNTY 08/13/2004 2340Z...AN F0 TORNADO TORE THE ROOF OFF A HOME ON THE BARRIER ISLAND IN DAYTONA BEACH SHORES INJURING AN ELDERLY WOMAN.

ORANGE COUNTY 08/13/2004 2030Z...FUNNEL CLOUD...PUBLIC REPORT IN PLYMOUTH.

LAKE COUNTY 08/13/2004 2100Z...FUNNEL CLOUD...PUBLIC REPORT IN TAVARES.

#### H. STORM EFFECTS...DAMAGE AND IMPACTS BY COUNTY

OSCEOLA COUNTY...LOCAL OFFICIALS UNABLE TO PROVIDE DETAILED STATISTICS AT THIS TIME. NO DEATHS DIRECTLY RELATED TO HURRICANE CHARLEY. ONE DEATH WAS REPORTED IN THE NEWS AS INDIRECTLY RELATED TO HURRICANE CHARLEY WHEN A PERSON WAS KILLED IN A CAR ACCIDENT MONDAY MORNING AUGUST 16TH. WIDESPREAD DAMAGE TO HOUSES...ROOFS...POOL SCREENS AND CARS...MUCH DUE TO FALLEN TREES. DAMAGE TO SOME WEAK BUILDINGS AND MOBILE HOMES. 100,000 RESIDENCES WITHOUT POWER.

ORANGE COUNTY...LOCAL OFFICIALS UNABLE TO PROVIDE DETAILED STATISTICS AT THIS TIME. ONE YOUNG GIRL KILLED IN MULT-CAR ACCIDENT WHEN MOVING VAN LOST CONTROL IN HIGH WINDS AND ROLLED ON TOP OF CAR ON HIGHWAY 528 IN EASTERN ORANGE COUNTY AROUND 415 PM AUGUST 13TH. A SECOND DEATH IS OFTEN MENTIONED IN NEWS REPORTS BUT NO SPECIFICS CAN BE FOUND AT THIS TIME. WIDESPREAD DAMAGE TO HOUSES AND CARS...MOSTLY

FROM FALLEN TREES. 250,000 RESIDENCES WITHOUT POWER. DAMAGE TO PORCHES...POOL SCREENS...ROOF TILES. DAMAGE TO SOME WEAK BUILDINGS AND MOBILE HOMES.

LAKE COUNTY...NO DEATHS OR INJURIES. SOME DOWNED TREES AND POWERLINES IN SOUTHERN PORTION OF COUNTY. THREE HOUSES DAMAGED BY FALLING TREES. NO MAJOR INFRASTRUCTURE DAMAGE.

SEMINOLE COUNTY...LOCAL OFFICIALS UNABLE TO PROVIDE DETAILED STATISTICS AT THIS TIME. FROM NWS AREAL SURVEY...THOUSANDS OF TREES DOWN OVER THE COUNTY. NUMEROUS WIDE SPAN BARNs...BOAT GARAGES ON LAKES...AND SOME WAREHOUSE-TYPE BUILDINGS DAMAGED. LARGE WOODED AREAS EXIST WHERE ALL PINE TREES ARE BLOWN DOWN. COUNTY-WIDE DAMAGE TO FENCES...SHEDS...AWNINGS...FLORIDA ROOMS.

VOLUSIA COUNTY...TWO DEATHS INDIRECTLY RELATED TO HURRICANE CHARLEY. ONE WOMAN ELECTROCUTED APPROXIMATELY 230 AM AUGUST 14TH AFTER STEPPING ON DOWNED POWERLINE IN DAYTONA BEACH. ONE MAN WAS KILLED WHEN A LARGE PORTION OF A TREE FELL ON HIM DURING CLEANUP ABOUT 100 PM AUGUST 14TH. APPROX 300,000 PEOPLE WITHOUT POWER AT PEAK OF STORM. INITIAL DAMAGE ESTIMATES ARE AT \$51.9 MILLION. TWELVE BUSINESSES...31 HOUSES...SEVEN MOBILE HOMES AND ONE EIGHT-UNIT APARTMENT BUILDING WERE DESTROYED. 300,000 PEOPLE LOST POWER. ONE OF THE HARDEST HIT AREAS WAS ORMOND BEACH. AS HURRICANE CHARLEY MOVED OFFSHORE STRONG NORTHEAST WINDS ON THE NORTH SIDE OF THE EYEWALL BLEW THE ROOF OFF THREE BEACH-FRONT HOTELS AND BLEW DOWN A LARGE NUMBER OF TREES.

BREVARD COUNTY...NO DEATHS OR SERIOUS INJURIES. ABOUT 75,000 PEOPLE LOST POWER AT HEIGHT OF STORM. MOST SIGNIFICANT DAMAGE WAS IN NORTHERN BREVARD FROM TITUSVILLE NORTHWARD. HARDEST HIT WERE NORTHERN BREVARD COMMUNITIES OF SCOTTSMOOR...MIMS...AND TITUSVILLE. MOST DAMAGE WAS A RESULT OF FALLING TREES. PRELIMINARY ESTIMATES OF LESS THAN A MILLION DOLLARS IN DAMAGE.

INDIAN RIVER COUNTY...NONE. SHELTERS OPENED FOR 50 PEOPLE AND CLOSED AT 700 PM AUGUST 13TH.

OKEECHOBEE COUNTY...NO SIGNIFICANT IMPACT REPORTED AT THIS TIME.

ST. LUCIE COUNTY...NONE.

MARTIN COUNTY...NONE.

\$\$

HAGEMEYER/DECKER/JACOBS/CRISTALDI/DIETZMANN/TURNER/MOSELY/SPRATT