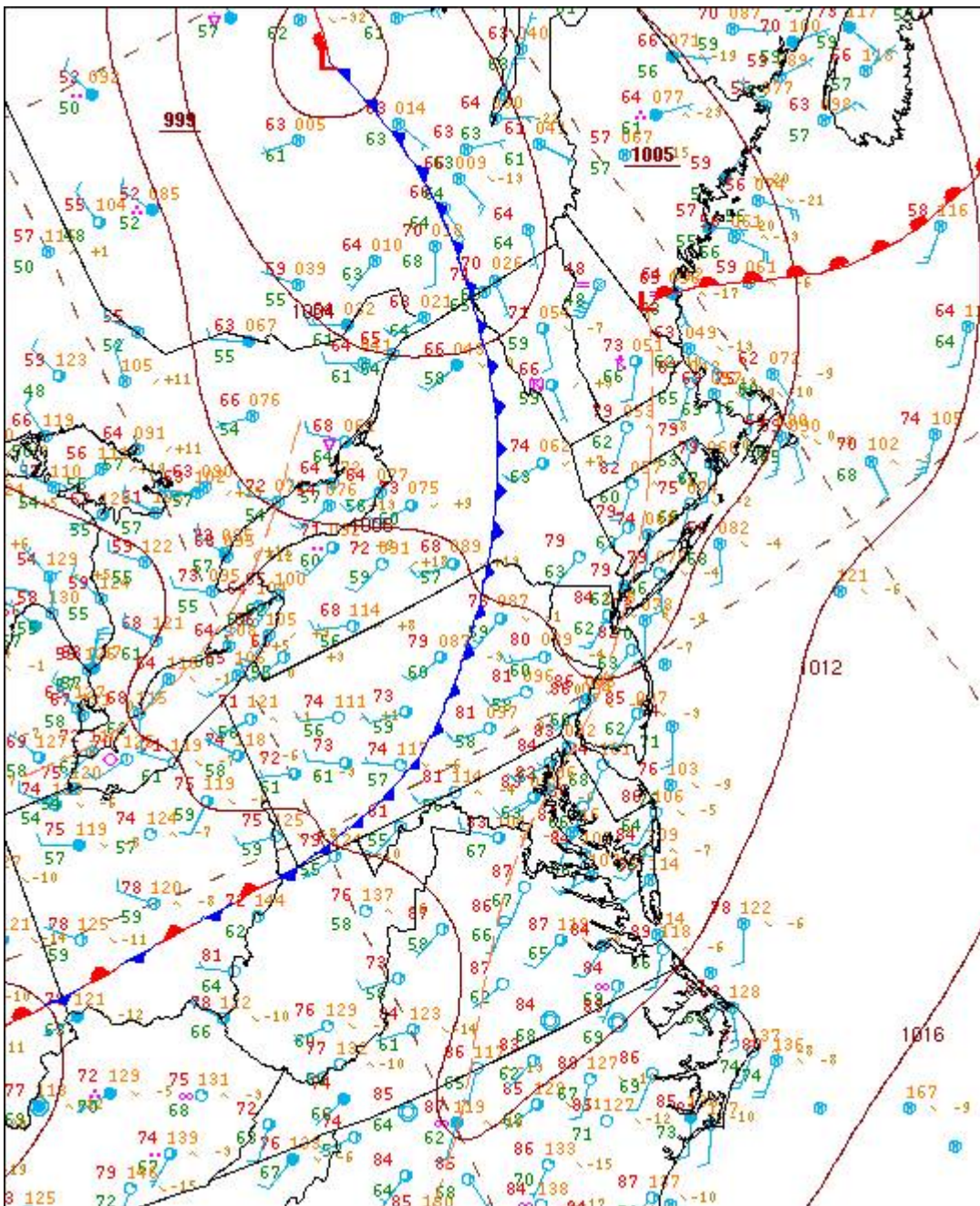


Monville Timothy

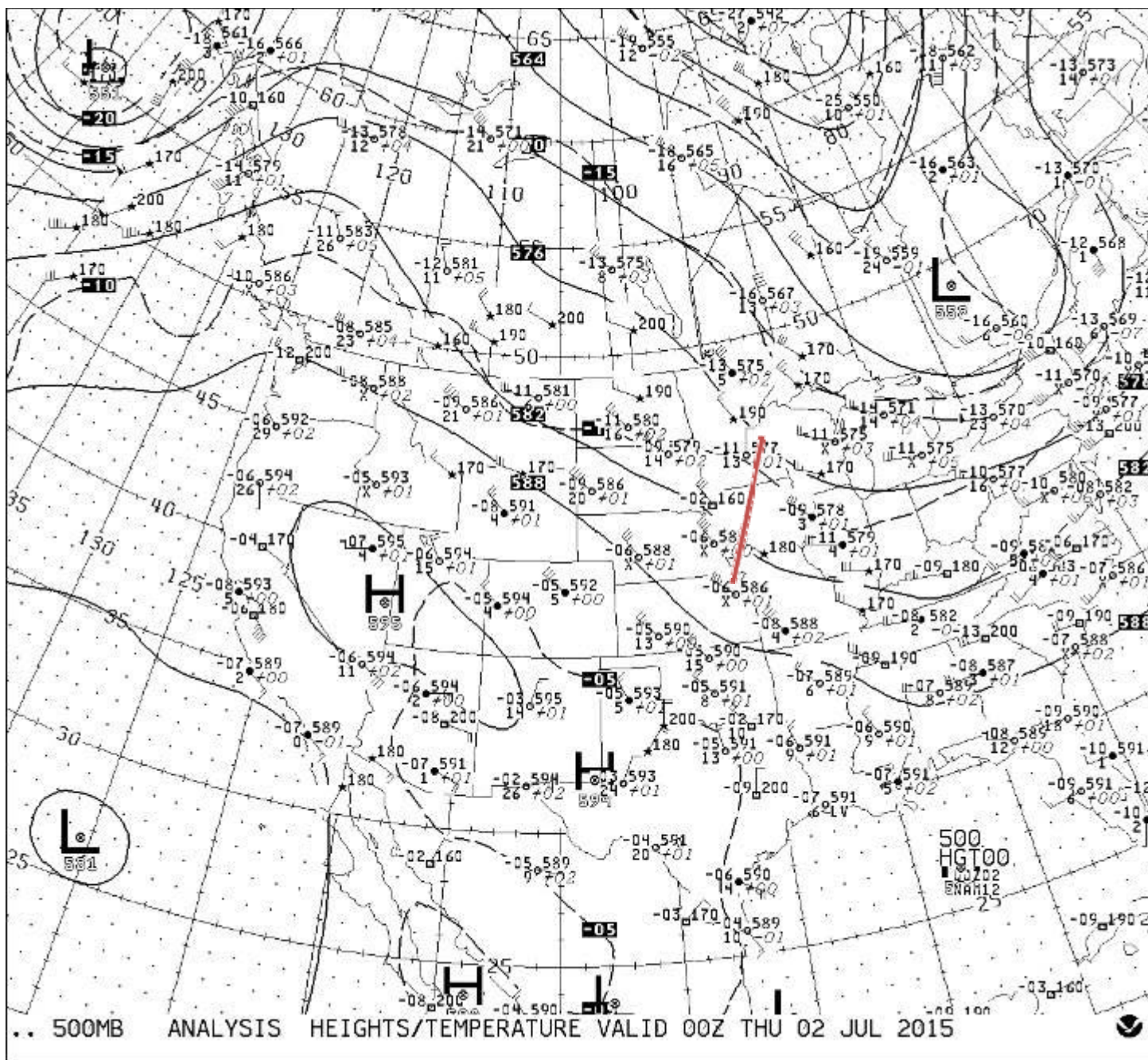
From: Eick Donald
Sent: Thursday, January 14, 2016 8:41 AM
To: Monville Timothy
Cc: Schulze Dana
Subject: ERA15LA257 - Galax Hillsville, VA Weather Study

Weather conditions on July 1, 2015 in the vicinity of Galax Hillsville, Virginia

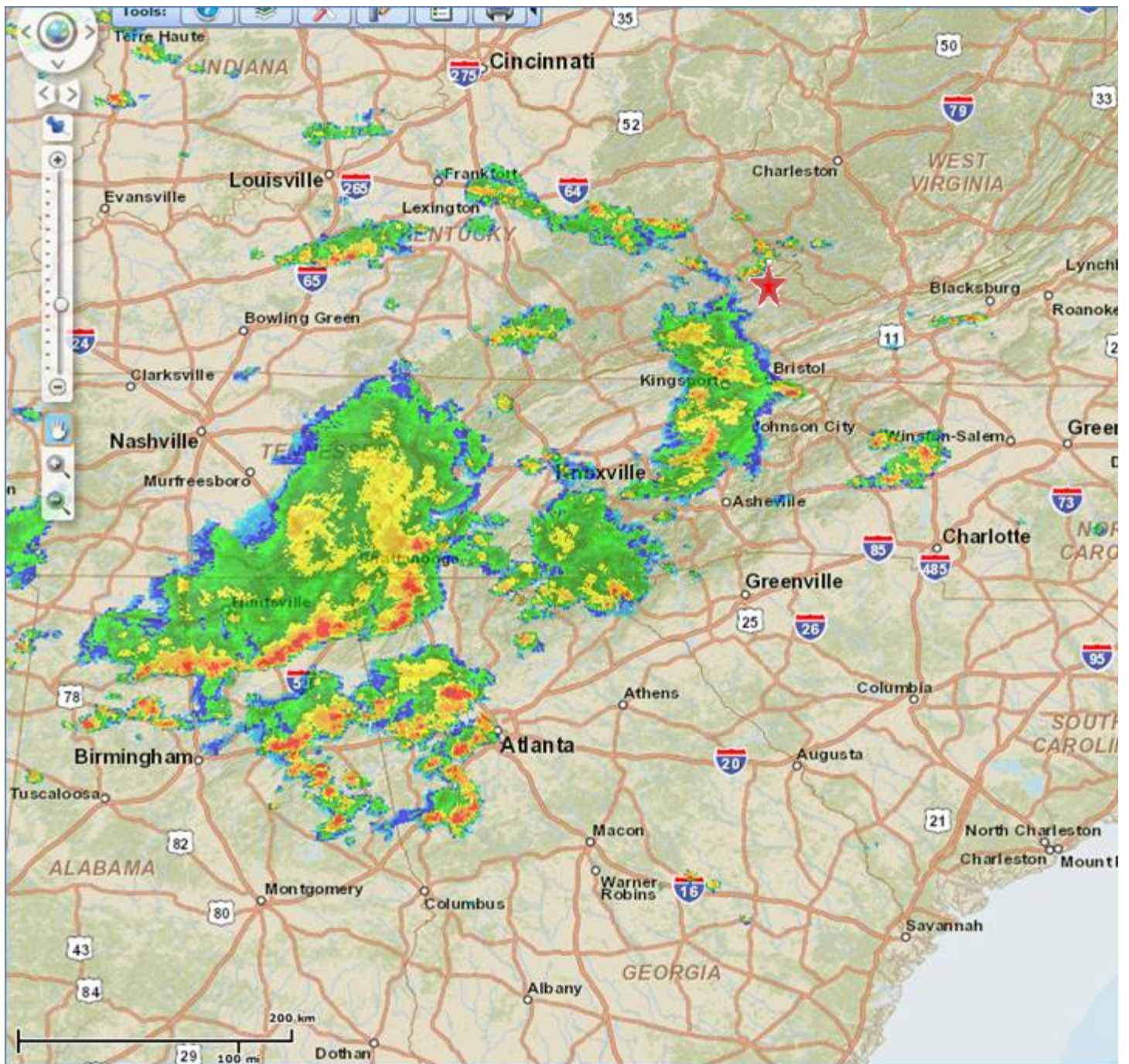
Synoptic conditions – The National Weather Service (NWS) Surface Analysis Chart for 1700 EDT (2100Z) over the region is included below. The chart depicted a low pressure system over Maine at 1005-hectopascals (hPa) with a warm front extending eastward and a trough of low pressure extending southward across Virginia in the vicinity of the accident site. Another deep low pressure system and associated cold frontal system extended over Canada into New York and Pennsylvania, and then westward as a stationary front into Ohio.

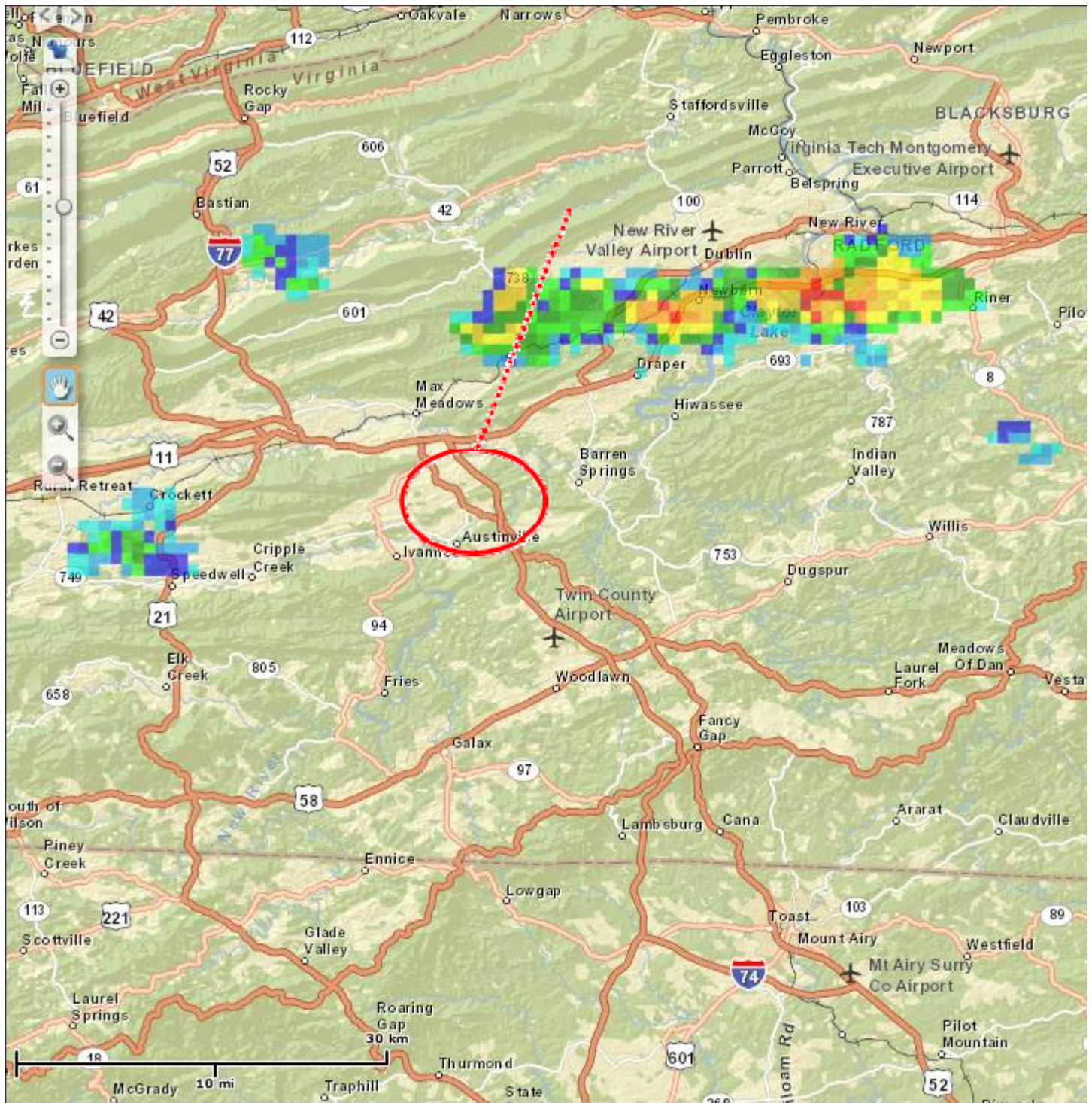


The NWS 500-hPa constant pressure chart depicted an upper level trough approaching the region and supported upward vertical motion favorable for thunderstorm development over the southeast centered over eastern Tennessee, northern Georgia and Alabama, into western North Carolina and Virginia.

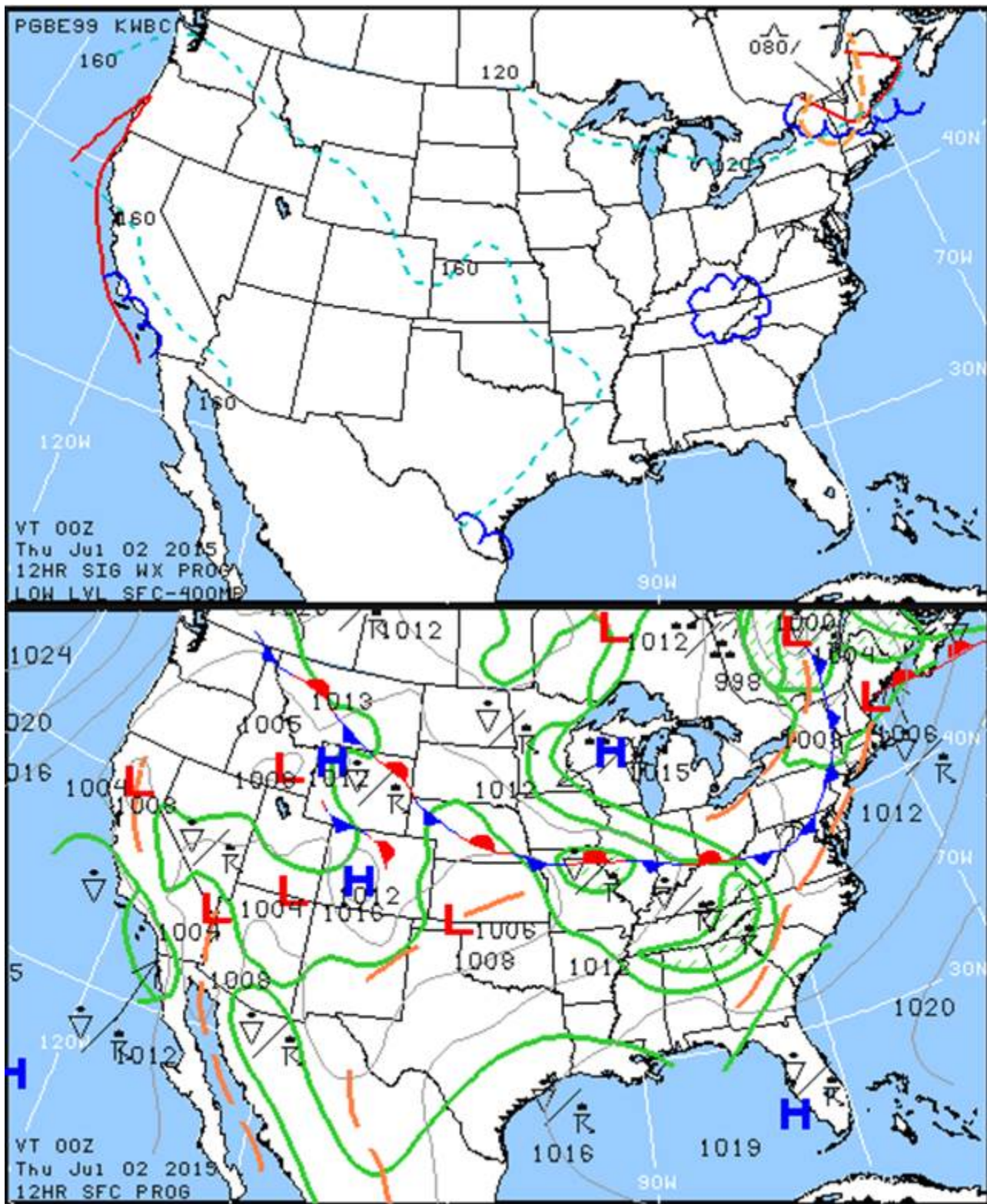


The NWS National radar mosaics for 1705 EDT on July 1, 2015 over the region is included below, with an additional zoomed in image over the accident site. The image depicted a large area of echoes over the southeast. The zoomed in image showed several echoes associated with rain showers between New River Valley Airport and the destination of Twin County Airport, the echoes were moving eastward with time, with no significant echoes in the vicinity of the accident site. The closest NWS weather radar was also examined for further details in the vicinity of the accident site.





The NWS 12 hour Low Level Significant Weather Prognostic Chart for the period depicted the trough of low pressure across the regions with an area of thunderstorms and rain showers over the southeast, including western Virginia and North Carolina, Georgia and Alabama. An area of MVFR conditions was also expected with the weather conditions immediately west of the accident site. The chart basically depicted an area of weather expected to develop over the southeast during the period immediately west and south of the accident site.



Observations – The accident occurred while the aircraft was in the pattern at Twi County Airport (KHLX), Galax Hillsville, VA, which had an Automated Surface Observation System (AWOS) installed for reporting weather and listed an elevation of 2,694 feet and a magnetic variation of 8° West. The following conditions were reported surrounding the period:

METAR KHLX 012015Z AUTO 23007KT 10SM SCT044 SCT050 25/16 A3001 RMK AO2 T02500159=
 METAR KHLX 012035Z AUTO 26004KT 10SM SCT046 BKN050 26/16 A3001 RMK AO2 T02550159=
 METAR KHLX 012055Z AUTO 24007KT 10SM BKN048 BKN050 BKN110 25/16 A3000 RMK AO2 T02450159=
 Accident 2105Z

METAR KHLX 012115Z AUTO 25006KT 10SM SCT048 SCT060 BKN095 24/16 A3001 RMK AO2 T02430164=
METAR KHLX 012135Z AUTO 26004KT 10SM CLR 24/17 A3001 RMK AO2 T02430170=

The wind component for runway 19 based on the 2055Z observation resulted in a 4 knot headwind component and a 6 knot crosswind.

The accident airplane departed from New River Valley Airport (KPSK) at 1640 EDT (2040Z), which was located approximately 23 miles NNE from the accident site. New River Valley Airport had an AWOS and listed an elevation of 2105 feet. The following conditions were reported surrounding the period.

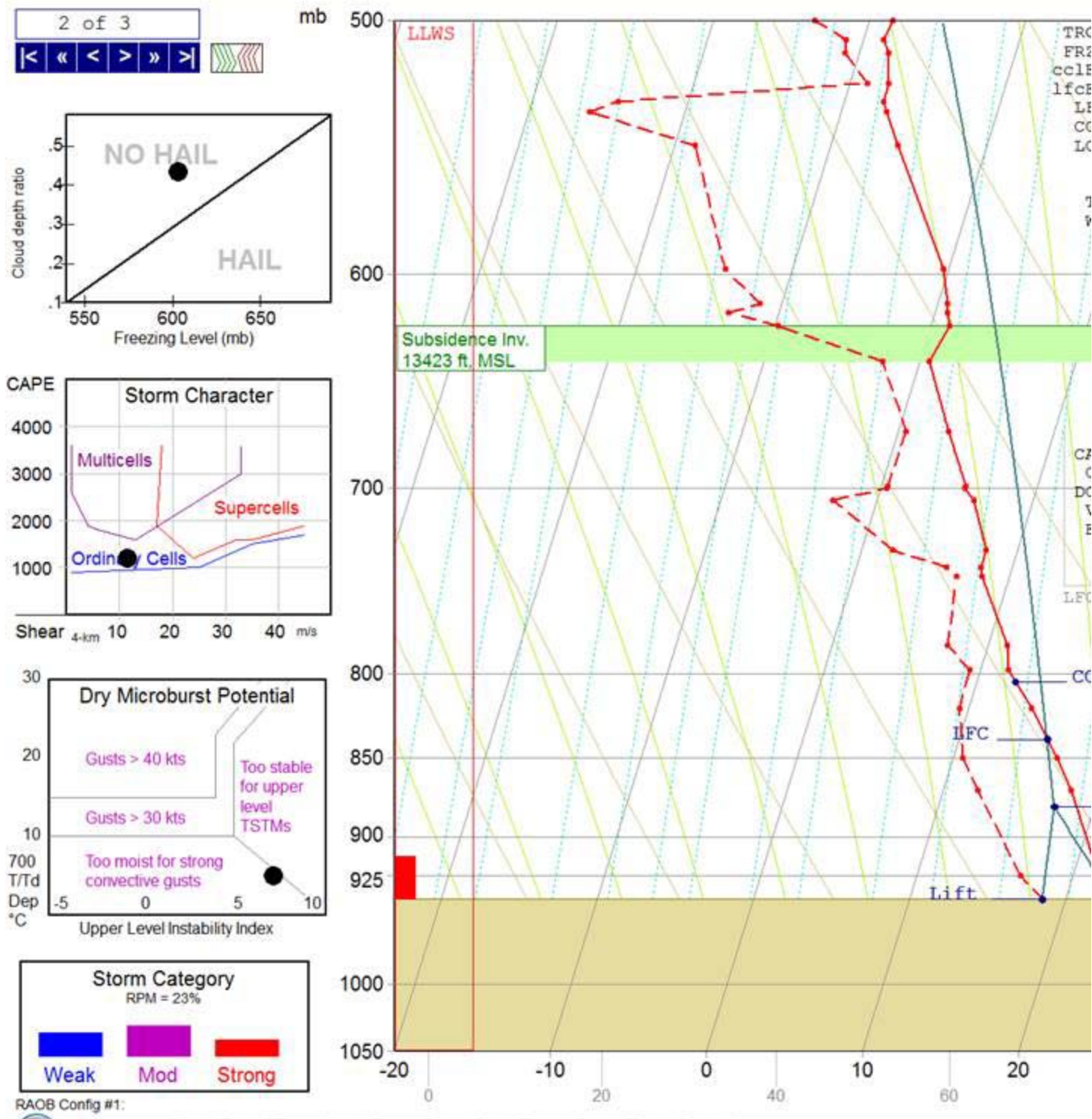
METAR KPSK 012015Z AUTO 32004KT 10SM SCT050 27/17 A2999 RMK AO2 T02710165=
METAR KPSK 012035Z AUTO 31005KT 7SM SCT060 SCT075 27/17 A2999 RMK AO2 T02700166=
Departed 2040Z
METAR KPSK 012055Z AUTO 20010G14KT 7SM BKN055 BKN065 25/18 A2999 RMK AO2 T02510182=
METAR KPSK 012115Z AUTO 21005KT 10SM SCT050 SCT060 OVC070 24/19 A2999 RMK AO2 T02370188=
METAR KPSK 012135Z AUTO 21004KT 7SM SCT070 BKN090 24/19 A2999 RMK AO2 T02400192=

The AWOS observations from KHLX and KPSK did not detect any significant precipitation during the period, although visibility was reduced to 7 statute miles for a period of time at KPSK during the period. The wind field indicated a NW wind at KPSK and a SSW at KHLX, indicating a cyclonic shift in winds likely associated with the trough.

Sounding– The Roanoke/Blacksburg (RNK) morning and afternoon upper air soundings surrounding the period were also reviewed. The 1900 EDT sounding (0000Z on July 2, 2015) depicted a destabilizing atmosphere with a Lifted Index of -3 and supported scattered thunderstorms and rain shower development during the afternoon period. The estimated cloud base was near 4,000 feet agl.

The freezing level was identified well above the accident airplanes cruising altitude at 14,284 feet and therefore not conducive to structural icing conditions. The moisture and temperature structure however favored a moderate to high potential for carburetor icing conditions below 10,000 feet.

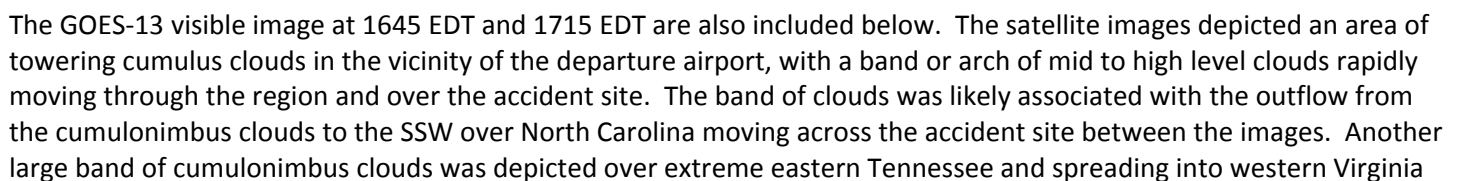
Morning sounding had stronger low-level winds to 30 knots decreasing in speed with the afternoon sounding. Both soundings showed light westerly surface winds with wind speeds increasing with height with little directional variation. Both soundings showed a low-level wind maximum from 5,000 feet down to 800 feet agl in the afternoon sounding, with a wind from the south-southwest at 17 knots. As a result, both soundings showed a light low-level wind shear environment below 800 feet agl with an approximately 15 knots shear and is indicated in red on the left side of the sounding. The accident airplane may have encountered a similar or stronger shear, and may have contributed to the accident sequence producing a decreasing shear.



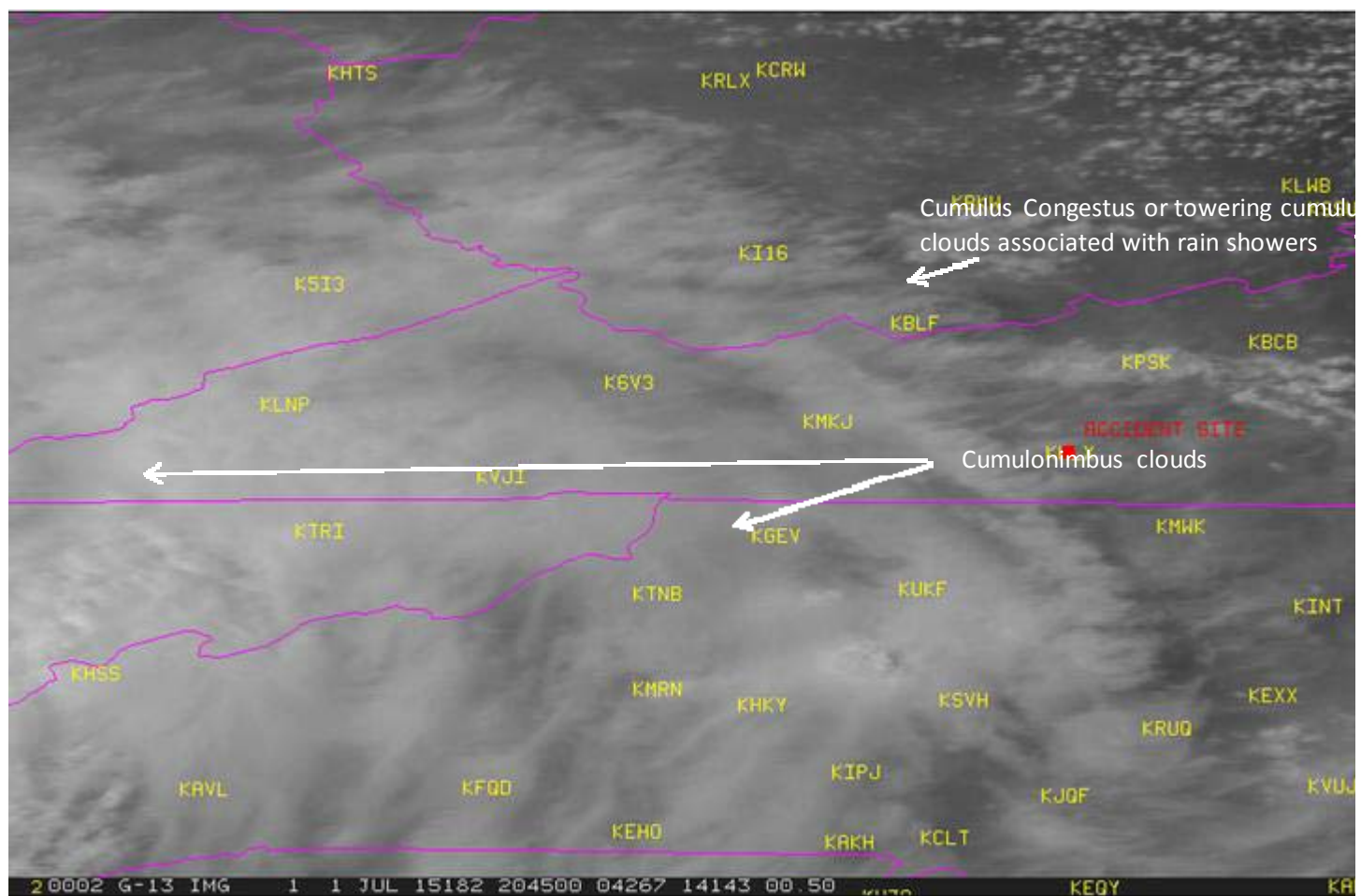
Pilot Reports (UA/UUA) – The following reports were noted over the region:

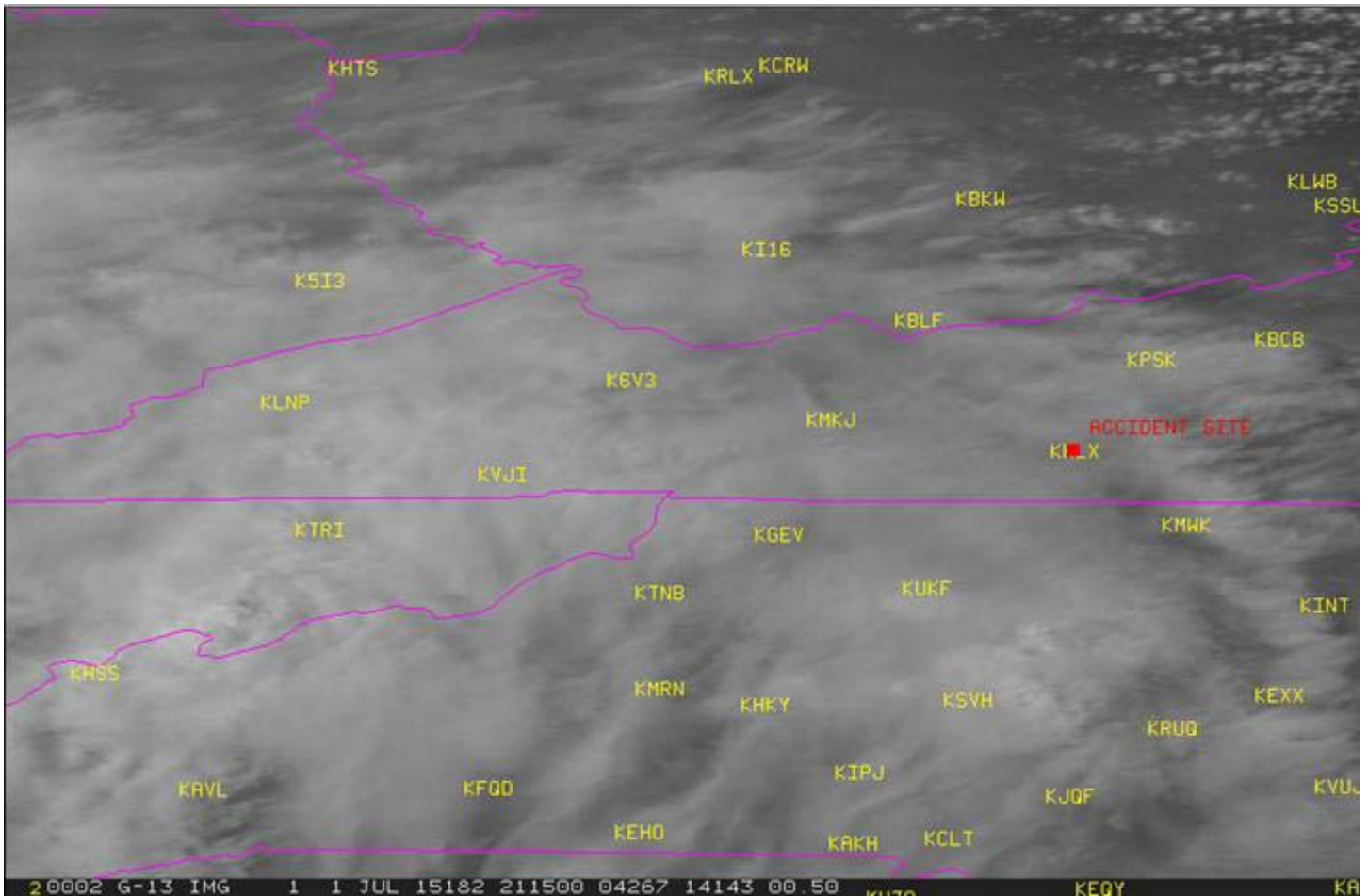
LWB UA /OV LWB/TM 1533/FL040/TP LJ31/RM BASES / 040
 CPK UA /OV ORF205015/TM 1535/FL030/TP C172/SK FEW018/WX FV10SM/TA 23/WV 28316KT/TB NEG/RM
 AEROVIEREPORTS / HAZE
 W99 UA /OV ESL190020/TM 1654/FL70/TP PA30/TB MOD CAT
 DAN UA /OV DAN080015/TM 1902/FL045/TP C172/SK SCT-BKN045/WX FV03SM HZ
 LYH UA /OV LYH /TM 1932 /FL045 /TP V22 /SK FEW050 /WX FV05SM

Satellite Imagery – the GOES-13 infrared and visible imagery were reviewed surrounding the period. The GOES-13 infrared image with a standard MB temperature enhancement curve for 1645 EDT indicated a large area of enhanced clouds bordering the accident site and moving eastward with time. The radiative cloud top temperature over the accident site ranged to 243° Kelvin or -30.16 Celsius (C), which corresponded to cloud tops near 30,000 feet. The enhanced areas in blue were associated with cumulonimbus clouds and were located to the south and west-southwest of the region.

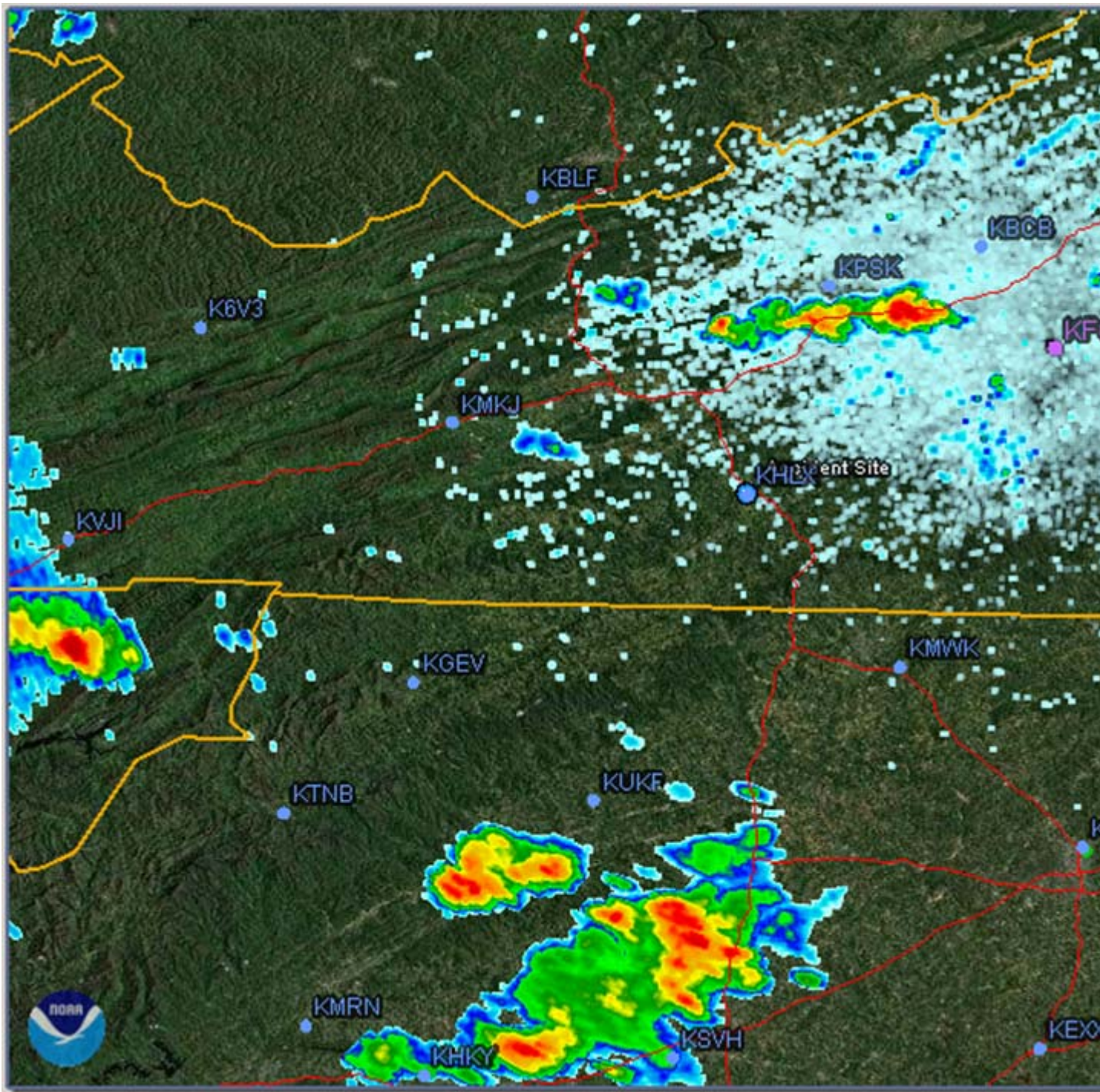


and North Carolina during the period. The cloud bases were near 4,000 feet agl based on observations. While the band is seen moving across the region in the 30 minute period, no significant changes were observed in the surface observations during the period.





Weather Radar Imagery – the NWS Roanoke WSR-88D base reflectivity image for 1706 EDT (2106Z) located 30 miles east was also reviewed and depicted only very light echoes associated with ground clutter below the temperature inversion over the region, with several defined cells associated with rain showers and thunderstorm immediately south of the departure airport and approximately 40 miles south over North Carolina and 60 miles west-southwest over Tennessee. The closest echo was located approximately 10 miles west at 20 dBZ. No outflow boundaries were identified in the vicinity of the accident site. The various elevation scans did not report any significant echoes aloft and the radial velocity data did not detect any significant variation in wind speed or direction over the accident site. No indication of microburst activity, dry or wet were indicated within 10 miles of the accident site.



NWS Area Forecast (FA) – the NWS Area Forecast was the legal route forecast and expected broken clouds at 5,000 feet with tops near 7,000 feet, with widely scattered thunderstorms and light rain over the region with cumulonimbus cloud tops to 43,000 feet.

FA1W

-BOSC FA 011946 AMD

SYNOPSIS AND VFR CLDS/WX

SYNOPSIS VALID UNTIL 021200

CLDS/WX VALID UNTIL 020600...OTLK VALID 020600-021200

ME NH VT MA RI CT NY LO NJ PA OH LE WV MD DC DE VA AND CSTL WTRS

SEE AIRMET SIERRA FOR IFR CONDS AND MTN OBSCN.

TS IMPLY SEV OR GTR TURB SEV ICE LLWS AND IFR CONDS.
NON MSL HGTS DENOTED BY AGL OR CIG.

SYNOPSIS...18Z WRMFNT FM NRN VT-SERN MA. CDFNT FM WRN NY-SERN OH-SRN IN.
SFC TROUGH FM WRN MA-NRN DE-SERN VA. 12Z CDFNT FM ERN ME-SERN VA-SRN WV-SRN IN.

MD DC DE VA...UPDT

WRN MD...SCT050 SCT CI. AFT 04Z VIS 3SM BR. OTLK...MVFR BR.

SW VA...BKN050 TOPS 070. WDLY SCT -TSRA. CB TOPS FL430. 03Z SCT050 BKN CI. 06Z OVC080 LYRD FL250. OTLK...VFR SHRA 09Z
MVFR SHRA BR.

ERN MD/NRN VA/DC/DE...SCT-BKN040-050 TOPS 080. BECMG 0003 SCT060-070. OTLK...VFR.

SCNTRL VA...SCT CI. 00Z BKN100 TOPS 130. 06Z SCT-BKN070 LYRD FL250. OTLK...VFR.

SERN VA...SKC. 00Z SCT CI. 06Z SCT-BKN CI. OTLK...VFR.

&

NWS Advisories – there were no AIRMETs, Convective SIGMETs, or SIGMETs current over the accident site or applicable for the flight; however, a large area was identified to the west and southwest associated with thunderstorms over western Virginia, North Carolina, and Tennessee. Those advisories were as follows and can be seen as the enhanced area on the satellite image.

-MKCE WST 012055

CONVECTIVE SIGMET 92E

VALID UNTIL 2255Z

VA NC TN KY IN

FROM 50NNW IJU-50NNE LOZ-30WSW HNV-20SSE VXV

LINE TS 30 NM WIDE MOV FROM 27025KT. TOPS TO FL410.

CONVECTIVE SIGMET 93E

VALID UNTIL 2255Z

NC GA TN AL MS

FROM 40ESE BNA-30NNW ODF-50S LGC-50N IGB-40ESE BNA

AREA SEV TS MOV FROM 30025KT. TOPS ABV FL450.

HAIL TO 1.5 IN...WIND GUSTS TO 60KT POSS.

The Washington Center Weather Service Unit (CWSU) issued a Meteorological Impact Statement at 1351 EDT for a threat of isolated thunderstorms across the region. A Center Weather Advisory (CWA) was issued at 1446 EDT for one such area, which was not in the vicinity of the accident site. The advisories were as follows:

FAUS20 KZDC 011851

2015182 1851

ZDC MIS 02 VALID 011851-020300

...FOR ATC PLANNING PURPOSES ONLY...

ISOLD TSRA POSSIBLE ACRS ZDC THIS AFTERN / EVENG. AREA SHRA W/ EMBD

TSRA MVG INTO SW ZDC AFT 01Z. TOPS TO FL400 MOVG E-NE 25KT. OCNL

LGT-MOD CHOP ABV FL250 MAINLY NW ZDC.

FAUS21 KZDC 011946

2015182 1946

ZDC1 CWA 011945

ZDC CWA 101 VALID UNTIL 012030

20N CSN

DIAM 15NM

ISOLD TSRA WITH TOPS TO FL320 MVG E 25KT. IMPACTG DC METROS WEST GATES.

Winds and Temperature Aloft Forecast (FD) – the winds aloft data surrounding the area valid from 1500 through 2200 EDT were as follows:

FBUS31 KWNO 012005

2015182 2006

FD1US1

-DATA BASED ON 011800Z

VALID 020000Z FOR USE 2000-0300Z. TEMPS NEG ABV 24000

FT 3000 6000 9000 12000 18000 24000 30000 34000 39000

ROA 9900 2406+15 2616+08 2720+02 2828-09 2834-19 285134 286644 296357

TRI 2721+13 2823+08 2718+02 2929-07 2731-18 273833 284244 295257

CRW 9900 2713+14 2720+07 2720+04 2827-09 2832-19 284935 276444 286456

The Roanoke (ROA) forecast for 3,000 feet was for light and variable winds with winds from the west with increasing speeds with height above 6,000 ft. Winds less than 10 knots were expected below 6,000 feet with above freezing temperatures. The forecast for Yeager Airport, WV (CRW) expected light winds at 3,000 feet with westerly winds at 13 knots at 6,000 feet and at Tri-City, Bristol, TN (TRI) was 21 knots.

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