N49RF ERROR SUMMARY
20200913N1

Flight ID: 20200913N1

Sensor or System	Number or Name
Static Pressure Probe	PSM.2
Dynamic Pressure Probe	PQM.2
Total Temperature Probe	TTM.1
Dewpoint Temp. Probe	TDM.2
Vertical Accelerometer	AccZI.1
Altimeter	AltGPS.3
INE Selection	1
Differential Attack Pressure Probe	PDALPHA.2
Differential Sideslip Pressure Probe	PDBETA.2
Dynamic Attack Pressure Probe	PQALPHA.2
Dynamic Sideslip Pressure Probe	PQBETA.2
Flight Directory	acdata/2020/MET/20200913N1

Local Met Data	Takeoff KLAL (1736Z)	Landing KLAL (0000Z)
Dynamic Corrections		Yes
AttackAngleIntercept		3.97801
AttackAngleSlope		3.86172
SlipAngleIntercept		1.258
SlipAngleSlope		6.69941
AttackAngleIntercept2		5.05753
AttackAngleSlope2		5.52397
SlipAngleIntercept2		0.931
SlipAngleSlope2		6.57562

Notes:
There were no edits made in the measured parameters used to calculate meteorological and navigational parameters.

Takeoff/Landing data: Data during landing and takeoff are potentially suspect. It is recommended that ground data not be used for scientific analysis.

Expendable Type	# deployed	# good	# transmitted	
Dropsondes	63	55	55	
Test sondes	0	0	0	
AXBTs	0	0	0	
AXCPs	0	0	0	
AXCTDs	0	0	0	
UAS	0	0	0	

Flight Director: Hathaway / Flaherty
Phone #: 863-500-3911

ACAT-4 Version = 7.3

U.S. Department of Commerce / NOAA / OMAO / Aircraft Operations Center - N49RF Manifest

FLIGHT INFORMATION

FLT ID:	20200913N1	FLT #:	
From:	KLAL	ETD:	1730 ~7.5 hrs
To:	KLAL	ETA:	0130

Block Time		Flight Time	
In:	0117Z	Land:	0110Z
Out:	1726Z	T/O:	1736Z
Total:	7.8	Total:	7.6

Sponsoring Org:	HRD/ONR
Program:	Hurricane 2020-PRX
Purpose:	Sally TS Research

CREW MANIFEST

AC:	Mansour	Scientists:
CP(s):	Nardi	
	Varwig	
Nav(s):		
FE(s)		
FD(s):	Hathaway	
	Flaherty	Visitors:
SEB:		
SSA:	Defeo	
AVAPS:	Hartberger	

MISSION INFORMATION

Pressure		Dropsondes ~~total~~ 63 drops		
		Good	Bad	Sent
A/C Takeoff		55	8	55
ASOS Takeoff				
		BTs		
		Good	Bad	Sent
A/C Land		0	0	0
ASOS Land				

Storm Number ID: (ie: AL072012)	AL 19 2020
TCPOD/WSPOD Mission (ie: NOAA2 2418A SANDY)	NOAA9 WA19A SALLY

OBSERVATIONS

Fix Number	Obs Number	Fix Time	SLP

AS REQUIRED BY ORM	Y	N
VOLCANIC ASH		
SCIENCE MISSION WITHIN BDRY LAYER		
LACK OF PRECIPITATION		
RELATIVE HUMIDITY ≥ 80%		
LARGE AIR-SEA TEMP GRADIENT		
HIGH SURFACE WINDS		
LONG FETCH / DURATION OF SFC WND		
SEA SALT ACCRETION FORECAST		
SEA SALT ACCRETION OBSERVED		

REMARKS

Gmax: **Gmin:** *Highlighted items must be completed before departure.

Remarks:

G-IV QC Checklist

Overall Assessment	Minor instrument issue(s) - minimal mission impact.

Flight ID:	20200913N1
Flight Director(s):	Hathaway / Flaherty
Mission:	Non-tasked Science Collection/Research
UWZ.d mean:	0.12

Pressure Comparison		
	T/O	Land
Aircraft	1008.8	1008.8
Tower	1008.2	1008.6

	Raw 1Hz Mean File Parameters				C File Parameters	
☐ Accelerometer	☑ AccAXI.1	☑ AccAYI.1	☑ AccAZI.1	☑ AccZI.1	☑ AccZref	
	☑ AccAXI.2	☑ AccAYI.2	☑ AccAZI.2	☑ AccZI.2		
	☑ AccAXI.3	☑ AccAYI.3	☑ AccAZI.3	☑ AccZI.3		
☐ Altitude	☑ AltGPS.1	☑ AltI.1	☑ AltPaADDU.1	☑ AltBCADDU.1	☑ ALTref	
	☑ AltGPS.2	☑ AltI.2	☑ AltPaADDU.2	☑ AltBCADDU.2	☑ ALTPA.d	
	☑ AltGPS.3	☑ AltI.3	X AltRA.1		☑ ALTGA.d	
☐ Ground Speed	☑ GsXI.1	☑ GsYI.1	☑ GsZI.1	☑ GsGPS.1	☑ GSXref	
	☑ GsXI.2	☑ GsYI.2	☑ GsZI.2	☑ GsGPS.2	☑ GSYref	
	☑ GsXI.3	☑ GsYI.3	☑ GsZI.3		☑ GSZref	
	☑ GsXGPS.1	☑ GsYGPS.1	☑ GsZGPS.1			
	☑ GsXGPS.2	☑ GsYGPS.2	☑ GsZGPS.2			
☐ Lat / Lon	☑ LatGPS.1	☑ LatI.1	☑ LonGPS.1	☑ LonI.1	☑ LATref	
	☑ LatGPS.2	☑ LatI.2	☑ LonGPS.2	☑ LonI.2	☑ LONref	
	☑ LatGPS.3	☑ LatI.3	☑ LonGPS.3	☑ LonI.3		
☐ Pressure	☑ PDALPHA.1	☑ PQALPHA.1	☑ PQM.1	☑ PSM.1	☑ PDALPHAref	☑ PQMref
	☑ PDALPHA.2	☑ PQALPHA.2	☑ PQM.2	☑ PSM.2	☑ PDBETAref	☑ PQ.c
	☑ PDBETA.1	X PQBETA.1			☑ PQALPHAref	☑ PSMref
	☑ PDBETA.2	X PQBETA.2			X PQBETAref	☑ PS.c
☐ Air Speed	☑ CasADDU.1	☑ CasADDU.2	☑ TasADDU.1	☑ TasADDU.2	☑ IAS.d	☑ TAS.d
☐ Pitch / Roll	☑ PitchI.1	☑ PitchRateI.1	☑ RollI.1	☑ RollRateI.1	☑ PITCHref	
	☑ PitchI.2	☑ PitchRateI.2	☑ RollI.2	☑ RollRateI.2	☑ ROLLref	
	☑ PitchI.3	☑ PitchRateI.3	☑ RollI.3	☑ RollRateI.3		
☐ Temp / Dewpt	☑ TTM.1	☑ TTM.4	X TDM.1		X TD.c	☑ TTMref
	☐ TTM.2		X TDM.2		X TDMref	☑ TA.d
	☑ TTM.3					
☐ Misc. (Must check)					☑ UWZ.d	☑ WS.d
					☑ DPJ_WSZ	☑ WD.d
					X HUM	

FLID_Mission_Documents.pdf:
☑ Error Summary
☑ Crew Manifest
☑ QC Checklist
☑ Dropwindsonde Log(s) - AVAPS and FD if completed
☑ Flight Track
☑ Miscellaneous FD Notes

QC Key	
Not checked	☐
Valid	☑
Errors (note)	X

NOTES:

Occasional Spikes in multiple sensors in CDO due to turbulence.
PQBeta.1 and PQBeta.2 are unrepresentative with unusual drop outs.
AltRA.1 has multiple significant dropouts and should not be used as absolute altitude.
When examined at high resolution, data from the three inertials shows "stairstepping" for all parameters for brief intervals (generally less than 15 seconds).
TDM.1 & TDM.2 were unrepresentative for the cruise portion of the mission above 41K and also for intervals at low altitudes.
Consider all relative humidity values to be considered suspect.
TTM.3 has a small amplitude (magnitude 0.2 – 0.3 deg C) unnatural oscillation with a period of roughly 30 seconds.
TTM.1 was used for calculation of Ambient Temperature (TA) and other derived parameters.
There were no edits made in the measured parameters used to calculate meteorological and navigational parameters.
Takeoff/Landing data: Data during landing and takeoff are potentially suspect...
It is recommended that ground data not be used for scientific analysis.

AOC GPS Dropwindsonde Log (updated Mar 2019)

55/63

Flight ID: 20200913 N1 ASPEN Operator/Flight Director(s): FLAHERTY / HATHAWAY

Mission ID: NOAA9 WA19A SALLY Storm Name/Track: TS SALLY RESEARCH

Sonde #	Ob #	Launch Time HHMMSS (Z)	Sonde ID (m/n last 5)	Ch # used	Lat (°N)	Lon (°E)	Prominent Wx Cond.	SFC Prs (mb)	Comments / Issues / QC / ASPEN Edits	KWBC #	Sonde Issues?
1	1	1816	20759	1	27.5	-82.9	OVC BLW	1009.9	BAD DEWPOINTS	1855	Y
2	2	1820	10601	2	27.6	-83.5	"	1008.0		1916	N
3	3	1824	20777	3	"	-84.0	BKN BLW	1006.5		1933	N
4	X	1828	—	4	—	—	—	—	NO PTH/NO BACK UP	X	Y
5	4	1833		1	27.6	-85.9	BKN BLW	999.9	LATE LAUNCH - GOOD SNDE	1939	N
6	5	1837	61028	2	27.6	-85.8	"	997.4	LATE LAUNCH - GOOD	1941	N
7	X	1841	40045	3	—	—	—	—	LATE / NO LAUNCH DERIV / NO BACKUP		Y
8	6	1843	30209	5	27.6	-86.7	"	1004.5		1946	N
9	X	1847	—	6	—	—	—	—	BAD - NLD		Y
10	7	1848	70135	7	27.6	-87.4	"	1006.6	BACK UP (RMVD LATE DATA)	1951	N
11	8	1852	20782	4	27.6	-87.9	"	1006.9		1956	N
12	9	1855	40230	8	27.6	-88.4	"	1007.2		1958	N
13	10	1910	10039	1	28.6	-87.0	"	1005.8		2005	N
14	11	1922	30551	2	29.4	-85.7	"	1008.1		2008	N
15	12	1926	70112	3	28.9	-85.6	"	1006.0		2010	N
16	X	1931	—	4	—	—	—	—	BAD NO PTH		Y
17	13	1933	40390	1	28.1	-85.6	"	1000.4	BACKUP	2018	N
18	14	1937	10464	5	27.6	-85.7	"	998.8		2024	N
19	15	1944	70139	6	26.8	-85.7	"	1002.4		2027	N
20	X	1951	—	8	—	—	—	—	BAD NO PTH		Y
21	16	1952	10596	3	25.9	-85.7	"	1005.4	BACKUP	2032	N
22	17	1956	51061	4	25.4	-85.9	"	1006.1		2037	N
23	18	2006	10641	1	26.4	-86.6	"	/	DIED AT 404 MB	2100	Y
24	19	2012	10465	7	27.1	-87.0	"	1004.4		2106	N
25	20	2018	20781	2	27.7	-87.4	"	1005.4		2109	N
26	21	2024	70113	3	29.4	-87.0	"	1005.2		2114	N
27	22	2029	30590	4	29.0	-86.6	"	1005.5		2142	N
28	23	2035	30536	1	29.0	-85.8	"	1005.7		2202	N
29	24	2041	40612	2	29.0	-85.0	OVC BLW	1005.5		2223	N
30	X	2047	—	5	—	—	OVC BLW	—	BAD (NO PTH)		Y
31	25	2049	70085	3	28.2	-84.4	"	1004.1	BACK UP	2224	N
32	26	2053	70480	4	27.7	-84.2	"	1005.1		2230	N
33	27	2059	10758	1	27.1	-84.6	"	1004.2		2235	N
34	28	2105	70475	2	26.5	-85.1	"	1004.8		2237	N
35	29	2111	30710	3	26.5	-85.9	"	1004.6		2239	N
36	30	2117	10037	4	26.5	-86.7	"	1004.3		2242	N
37	31	2126	70101	1	26.3	-88.0	"	1005.9		2252	N
38	32	2135	10570	2	26.2	-89.1	SCT BLW	1006.5		2256	N

ASPEN Operator will ensure this form is delivered to the AOC Flight Director to be archived

Obs Xmitted	Obs Missed	# of sondes launched	# of bad sondes

COMMENTS:

AOC GPS Dropwindsonde Log (updated Mar 2019)

Flight ID: 20200913 N1 ASPEN Operator/Flight Director(s): FLAHERTY / HATHAWAY

Mission ID: NOAA9 WA19A SALLY Storm Name/Track: TS SALLY RESEARCH PG 2 of 2

Sonde #	Ob #	Launch Time HHMMSS (Z)	Sonde ID (min last 5)	Ch # used	Lat (°N)	Lon (°E)	Prominent Wx Cond.	SFC Prs (mb)	Comments / Issues / QC / ASPEN Edits	KWBC #	Sonde Issues?
31	33	2140	20737	3	26.9	-89.1	BKN BLW	1008.4		2306	N
32	34	2147	20738	4	27.7	-89.0	"	1006.3		2309	N
33	35	2153	30210	1	28.4	-88.7	"	1006.6		2314	N
34	36	2159	70110	2	29.2	-88.5	SCT BLW	1008.6		2313	N
35	37	2209	20787	3	29.6	-87.3	"	1007.5		2326	N
36	38	2218	20762	4	29.9	-86.0	BKN BLW	1008.5		2329	N
37	~~39~~	2227	—	1	—	—	—	—	BAD NO PTH	—	Y
38	39	2228	20736	2	29.4	-84.7	BKN BLW	1008.7	BACK UP	2339	N
39	40	2235	10754	3	29.1	-83.7	"	1009.1		2348	N
40	41	2244	10757	4	28.1	-83.4	OVC BLW	1009.0		2352	N
41	42	2252	51121	1	27.1	-83.0	"	1008.6		2358	N
42	43	2258	10760	2	26.5	-83.0	"	1008.8		0000	N
43	44	~~2308~~	30549	3	25.6	-83.8	"	1007.2		0003	N
44	45	2318	20789	4	25.1	-85.0	BKN BLW	1006.5		0005	N
45	46	2327	20778	1	24.6	-86.1	SCT BLW	1007.1		0007	N
46	47	2334	40004	2	25.0	-87.0	"	1006.2		0009	N
47	48	2342	30958	3	25.4	-87.9	"	1006.3		0021	N
48	49	2349	30945	4	25.9	-88.7	"	1005.8		0024	N
49	50	2355	10587	1	26.4	-89.4	"	1007.7		0030	N
50	51	0059	20003	2	27.2	-89.3	"	1007.4		0034	N
51	52	0010	20529	3	28.0	-89.0	"	1007.9		0037	N
52	53	0020	70477	4	28.1	-87.6	DARK	1004.1		0044	N
53	54	0031	30185	1	28.1	-86.2	"	999.2		0049	N
54	~~55~~	—	—	2	—	—	—	—	BAD NO PTH/NO BACK UP	—	Y
55	55	0043	10814	3	28.6	-84.5	"	1007.5	LAST REPORT	0103	N
56											
57											
58											
59											
60											
61											
62											
63											
64											
65											
66											
67											
68											

ASPEN Operator will ensure this form is delivered to the AOC Flight Director to be archived

COMMENTS:

Obs Xmitted	Obs Missed	# of sondes launched	# of bad sondes

Sheet 1 of 2

AVAPS Drop Log

Project: _____ Mission: TS Sally Flight ID: 20200913N1

Take Off: _____ Landing: _____ Flt Dir: Hathaway Launcher S/N: _____

Drop #	Sonde Serial #	Rcvr #	Press Offset	Launch Time	Operator	Charge $$ To	Comments	Good ?
1	195120759	1	Ø	1816	JEH	ONR	Rel hum die halfway	
2	195110601	2	Ø	1820	↑	↑		✓
3	195120777	3	Ø	1824				✓
4	195110038	4	Ø	1828			No temp Hum	
5	195110552	1	Ø	1833				✓
6	200361028	2	Ø	1837				✓
7	194840045	3	Ø	1841			No temp Hum	
8	194830209	5	Ø	1843				✓
9	195130535	6	-0.1	—			No launch detect	
10	200370135	7	Ø	1848				✓
11	195120782	4	Ø	1852				✓
12	201144230	8	Ø	1855				✓
13	195110039	1	Ø	1910				✓
14	195130551	2	Ø	1922				✓
15	200370112	3	Ø	1926				✓
16	194830715	4	Ø	1931			No temp Hum	
17	200240390	1	Ø	1933				✓
18	200410464	5	-0.3	1937				✓
19	200370138	6	-0.3	1944				✓
20	200370137	2	Ø	1951			No temp Hum	
21	195110596	3	Ø	1952				✓
22	201651061	4	Ø	1956				✓
23	195110041	1	Ø	2006			lost signal @24K	
24	200410465	7	Ø	2012				✓
25	195120781	2	Ø	2018				✓
26	200370113	3	Ø	2024				✓
27	195130540	4	Ø	2029				✓
28	195130536	1	Ø	2035				✓
29	194840012	2	Ø	2041				✓
30	195120786	5	Ø	2048	↓	↓	No temp Hum	
31	200370085	3	Ø	2049	JEH	ONR		✓

Mach 0.77

Drop #	Sonde Serial #	Rcvr #	Press Offset	Launch Time	Operator	Charge $$ To	Comments	Good ?
32	200 370 480	4	Ø	2053	JZH	ONR		✓
33	200 410 758	1	Ø	2059	↑	HRD		✓
34	200 370 475	2	Ø	2105		↑		✓
35	194 830 710	3	Ø	2111				✓
36	195 110 037	4	Ø	2117				✓
37	200 370 101	1	Ø	2126				✓
38	195 110 570	2	Ø	2135				✓
39	195 120 737	3	Ø	2140				✓
40	195 120 738	4	Ø	2147				✓
41	194 830 210	1	Ø	2153				✓
42	200 317 110	2	Ø	2159				✓
43	195 120 787	3	Ø	2209				
44	195 120 762	4	Ø	2218				
45	195 110 260	1	Ø	2227			No temp Hum	
46	195 120 736	2	Ø	2228				
47	200 410 754	3	Ø	2236				
48	200 410 757	4	Ø	2244				
49	195 051 121	1	Ø	2252	↓	↓		
50	200 410 760	2	-1.0	2258	JZH	HRD		

Taped Cap

Drop Station Operator Notes

Charge $$ To Options (DO NOT USE FUNDING CODES):
AOC, NWS, HRD, NESDIS, IR/SST, AR, STAN (Stanford), SAT (JPSS/NESDIS/HRD)

AVAPS Pre-Flight Check:

- If time-permits, verify cabin pressure sensor w/ lab standard
- Start AVAPS., then start Soundings and set the Project Name and Full Flight ID (example: 20120823N2).
- Verify the Frequency band allocation as required:
  Band A: 53rd WRS - Band B: N42RF - Band C: N43RF - Band D: N49RF - Band E: Unallocated
- Select the **GPS Reference** tab from the **Soundings Displays** page and verify good GPS data
- Perform a prelaunch check on each channel, look for reasonable data and no CRC error status lights.
- Verify data is available on Remote AVAPS, then terminate the sonde.
- Verify the AVAPS Data mission folder has been created
- Verify AVAPS PC Time is correct – if time is off by >4sec, no data will display
- Early launch detects are caused usually by remanufactured sondes with the chute riser line not properly coiled below the PCB ear. This may also cause fast falls. If this is suspected, repack the riser line as time permits
- Perform RH Regeneration on all sondes – Multiple RD41 sondes may be processed at once

AVAPS Launch:

- Select a sonde frequency in the Green band and away from other sondes
- Enter sonde pressure error offset if 0.4mB or greater using cabin pressure sensor – warning, this can not be used during a climb
- If the Cal lab pressure standard and the cabin pressure standard match, apply pressure offset +/- 0.1 mB
- Wait until GPS available (green) on the pre-launch screen before continuing.
- Select "begin data collection" and verify good data with winds prior to putting sonde in launch tube
- On N42 & N43, remove about ½ of the ribbon. Do not shorten the ribbon on N49. Loosen ribbon and extend end of ribbon to near, but not over, the sensor end of the sonde. Place excess orange tape on end of ribbon to form a pocket.
- Place the sonde in the launch tube, sensor arm up, with the power pin socket facing right
- Verify the sonde is actively tracking GPS data prior to launch and no early launch detect

Sheet 2 of 2

Continuation Sheet

AVAPS Drop Log

Project: _____ Mission: TS Sally Flight ID: 2020 0913 N1

Take Off: _____ Landing: _____ Flt Dir: Hathaway Launcher S/N: _____

Drop #	Sonde Serial #	Rcvr #	Press Offset	Launch Time	Operator	Charge $$ To	Comments	Good ?
5 1	195 130 549	3	Ø	2308	JEH	HRD		✓
5 2	195 120 783	4	Ø	2318	↑	↓		✓
5 3	195 120 778	1	Ø	2327				✓
5 4	194 840 004	2	Ø	2334				✓
5 5	200 230 958	3	Ø	2342				✓
5 6	200 230 945	4	Ø	2349				✓
5 7	195 110 587	1	Ø	2355				✓
5 8	200 370 059	2	Ø	0003				✓
5 9	194 920 529	3	Ø	0010				✓
60 ~~10~~	200 370 477	4	Ø	0020				✓
61 ~~11~~	194 830 185	1	Ø	0031				✓
62 ~~12~~	200 230 964	2	Ø	0035	↓	↓	No temp Hum	
63 ~~13~~	200 410 814	3	Ø	0043	JEH	HRD		✓
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								

Drop #	Sonde Serial #	Rcvr #	Press Offset	Launch Time	Operator	Charge $$ To	Comments	Go ?
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								

Drop Station Operator Notes

Charge $$ To Options (DO NOT USE FUNDING CODES):
AOC, NWS, HRD, NESDIS, IR/SST, AR, STAN (Stanford), SAT (JPSS/NESDIS/HRD)

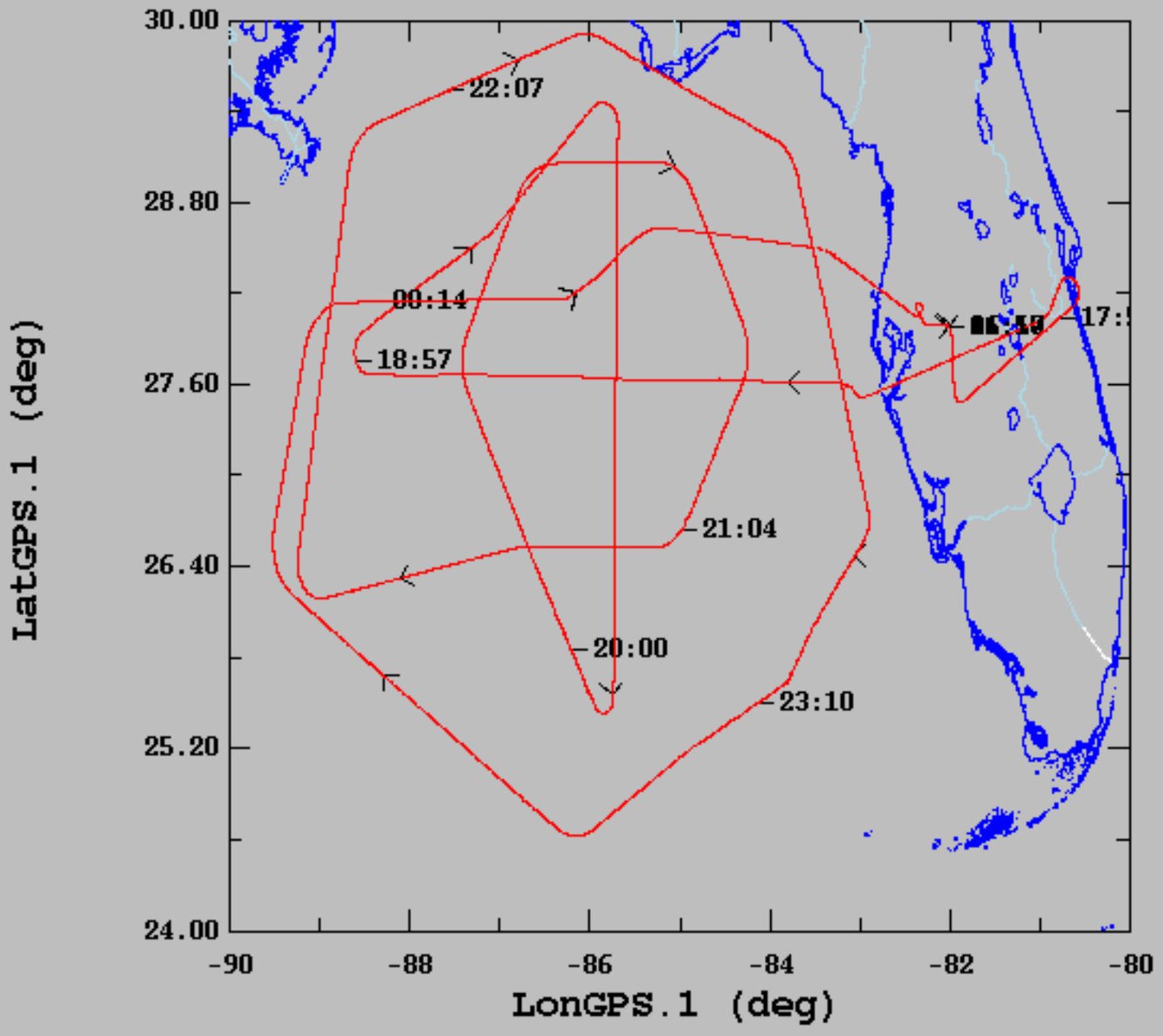
AVAPS Pre-Flight Check:

- If time-permits, verify cabin pressure sensor w/ lab standard
- Start AVAPS., then start Soundings and set the Project Name and Full Flight ID (example: 20120823N2).
- Verify the Frequency band allocation as required:
  Band A: 53rd WRS - Band B: N42RF - Band C: N43RF - Band D: N49RF - Band E: Unallocated
- Select the **GPS Reference** tab from the **Soundings Displays** page and verify good GPS data
- Perform a prelaunch check on each channel, look for reasonable data and no CRC error status lights.
- Verify data is available on Remote AVAPS, then terminate the sonde.
- Verify the AVAPS Data mission folder has been created
- Verify AVAPS PC Time is correct – if time is off by >4sec, no data will display
- Early launch detects are caused usually by remanufactured sondes with the chute riser line not properly coiled below the PCB ear. This may also cause fast falls. If this is suspected, repack the riser line as time permits
- Perform RH Regeneration on all sondes – Multiple RD41 sondes may be processed at once

AVAPS Launch:

- Select a sonde frequency in the Green band and away from other sondes
- Enter sonde pressure error offset if 0.4mB or greater using cabin pressure sensor – warning, this can not be used during a climb
- If the Cal lab pressure standard and the cabin pressure standard match, apply pressure offset +/- 0.1 mB
- Wait until GPS available (green) on the pre-launch screen before continuing.
- Select "begin data collection" and verify good data with winds prior to putting sonde in launch tube
- On N42 & N43, remove about ½ of the ribbon. Do not shorten the ribbon on N49. Loosen ribbon and extend end of ribbon to near, but not over, the sensor end of the sonde. Place excess orange tape on end of ribbon to form a pocket.
- Place the sonde in the launch tube, sensor arm up, with the power pin socket facing right
- Verify the sonde is actively tracking GPS data prior to launch and no early launch detect

2020-09-13, 16:50:27-25:17:48



	mean	sigma	min	max
LatGPS.1 (deg), 1 s/sec	27.63	1.18	24.62	29.91
LonGPS.1 (deg), 1 s/sec	-85.36	2.39	-89.51	-80.56