

**NOAA / AOML / Hurricane Research Division
2021 Hurricane Field Program
Advancing the Prediction of Hurricanes Experiment (APHEX)**

FLIGHT LOG -- 20210704H1

MISSION PLAN			
FLIGHT ID	20210704H1	STORM	AL05/ELSA
MISSION ID	0905A	TAIL NUMBER	NOAA42
TASKING	NHC/EMC	PLANNED PATTERN	Rotated Fig. 4
MISSION SUMMARY			
TAKEOFF [UTC]	0828	LANDING [UTC]	1623
TAKEOFF LOCATION	Lakeland, FL	LANDING LOCATION	Lakeland, FL
FLIGHT TIME	8.0	BLOCK TIME	8.2
TOTAL REAL-TIME RADAR ANALYSES (Transmitted)	3 (3)	TOTAL DROPSONDES (Good/Transmitted)	13 (13/13)
OCEAN EXPENDABLES (Type)	None	sUAS (Type)	None
APHEX EXPERIMENTS / MODULES	None planned		
HRD CREW MANIFEST			
LPS ONBOARD	NA	LPS GROUND	Dunion
TDR ONBOARD	NA	TDR GROUND	Reasor/Gamache
ASPEN ONBOARD	NA	ASPEN GROUND	Aberson/Sellwood
NESDIS SCIENTISTS	NA		
GUESTS (Affiliation)	NA		
AOC CREW MANIFEST			
PILOTS	Didier, Legidakes, Rannenber, Copare		
NAVIGATOR	Freeman		
FLIGHT ENGINEERS	Sanchez		
FLIGHT DIRECTOR	Carpenter		
DATA TECHNICIAN	Richards		
AVAPS	Lynch		

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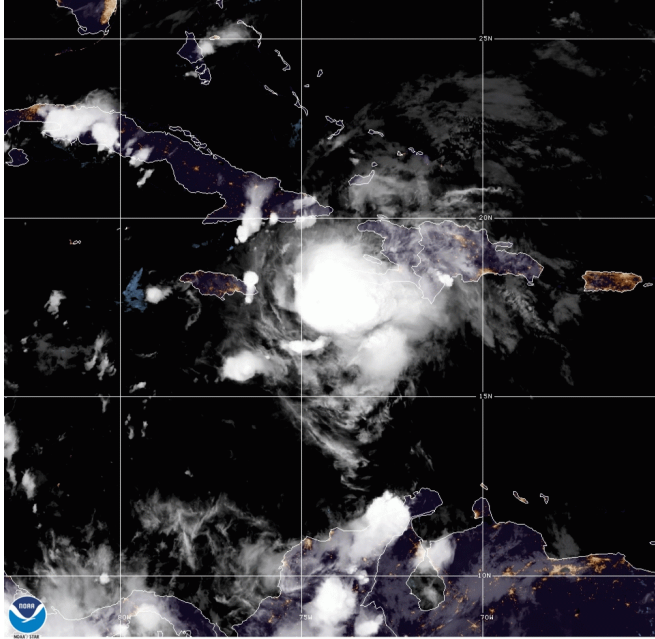
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PRE-FLIGHT	
Flight Plan	
Expendable Distribution	Dropsondes released at the endpoint and midpoint of each leg, as well as at the center of each pass.
Preflight Weather Briefing	Elsa is still a fairly disorganized system with a low level center displaced WNW of the deep convection- NHC lowered the intensity to 55 kt for the 03z advisory. Significant convective bursts and lightning this morning and the AF requested to go from 5 k ft to 10 k ft during a previous mission. N42 will also plan to fly at 10 k ft for today's mission and the track will be flown as planned with several shortened legs due to proximity to land (Cuba to the N and Jamaica to the S). The forecast storm position looks to be quite close to the planned rotated fig-4 that was submitted. 42 will fix (hunt) the center on the 1st and last passes.
Instrument Notes	The Compact Raman Lidar is not operational, and the WSRA and cloud physics probes are not yet installed. THOR is installed but not operational

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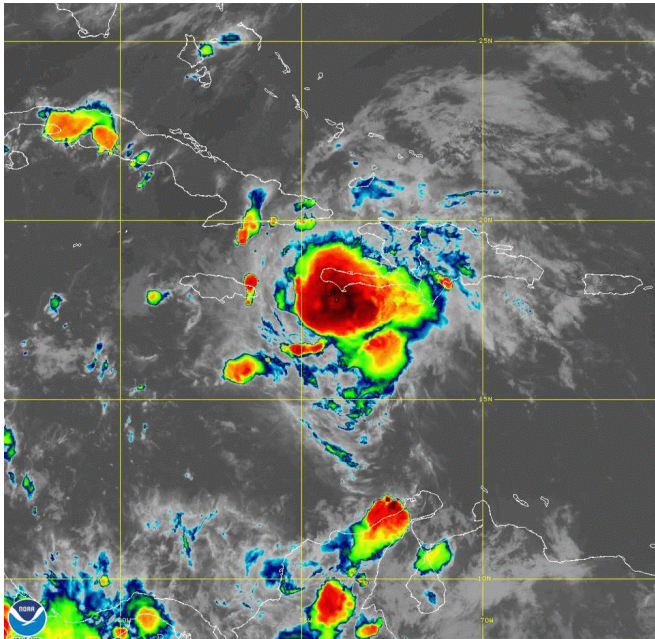
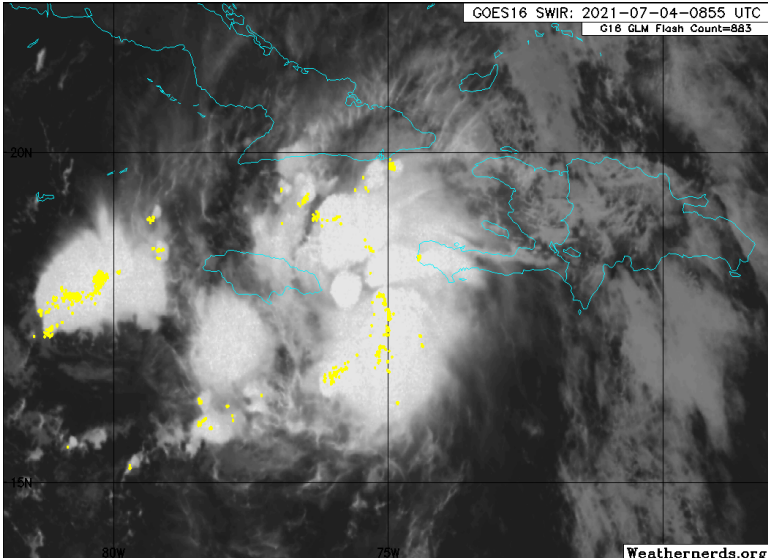
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	due to a failure of one of the components on the instrument.
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IN-FLIGHT	
Time [UTC]	Event
0300z	NHC downgraded Elsa to 55 kt / 1004 mb based on the most recent Teal mission.
0840z	 <p style="font-size: small; text-align: center;">04 Jul 2021 00:30Z NOAA/NESDIS/STAR GOES-East GEOCOLOR</p>

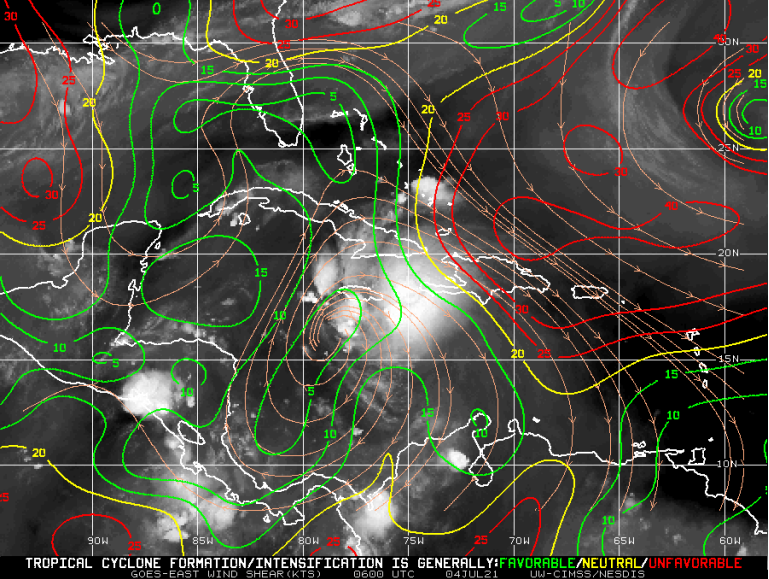
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0840z	 <p>04 Jul 2021 00:30Z NOAA/NESDIS/STAR GOES-East Band 13 TS Elsa</p>
0855z	 <p>GOES16 SWIR: 2021-07-04-0855 UTC G18 GLM Flash Count=883</p> <p>Weathernerds.org</p>

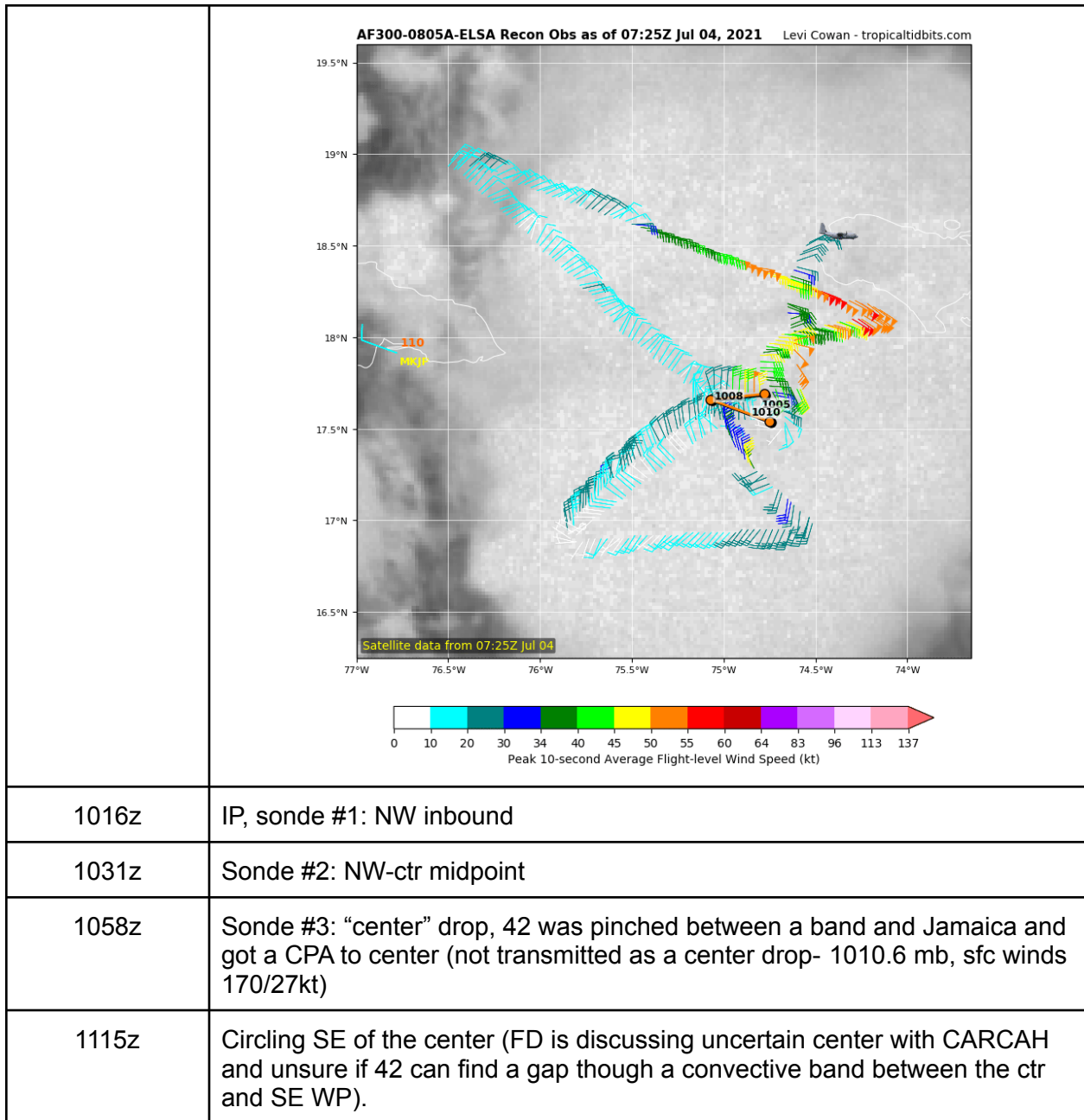
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0900z	From NHC 0900z advisory- AF found Elsa's center quite a bit farther E than previous fixes and it now appears to be more aligned with the deep convection (perhaps a top-bottom formation of a new LLC).

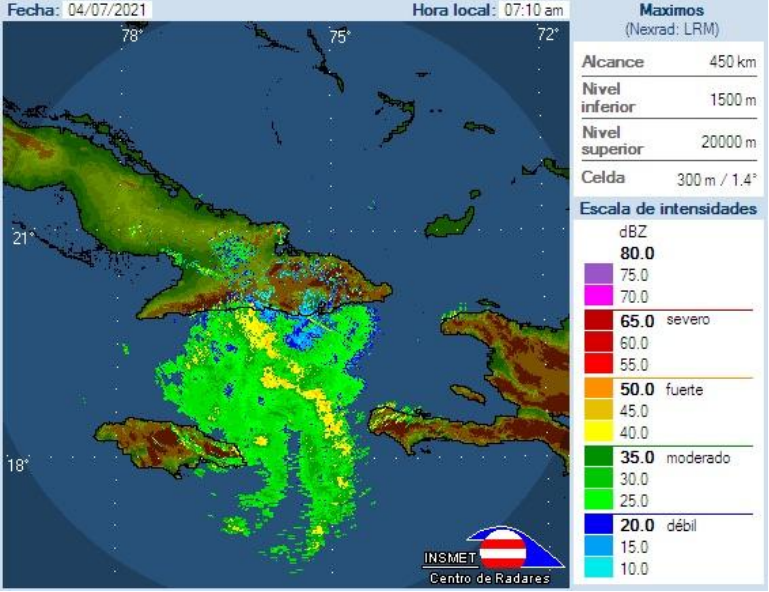
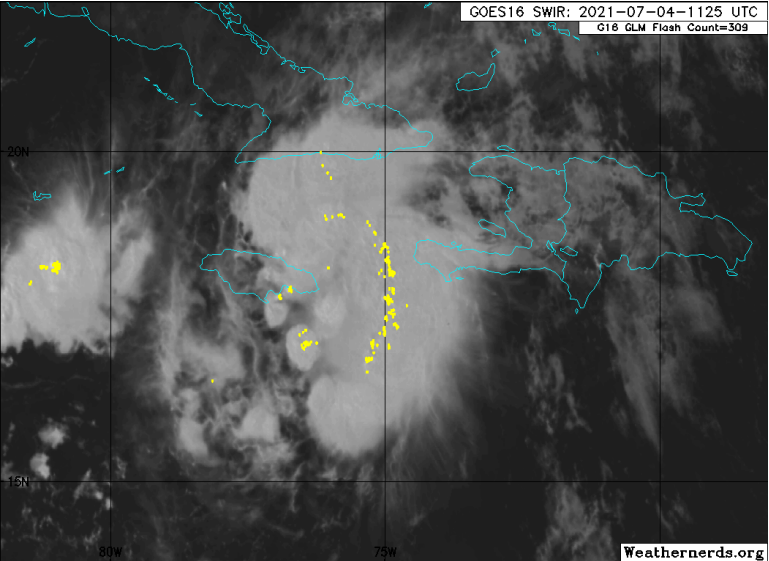
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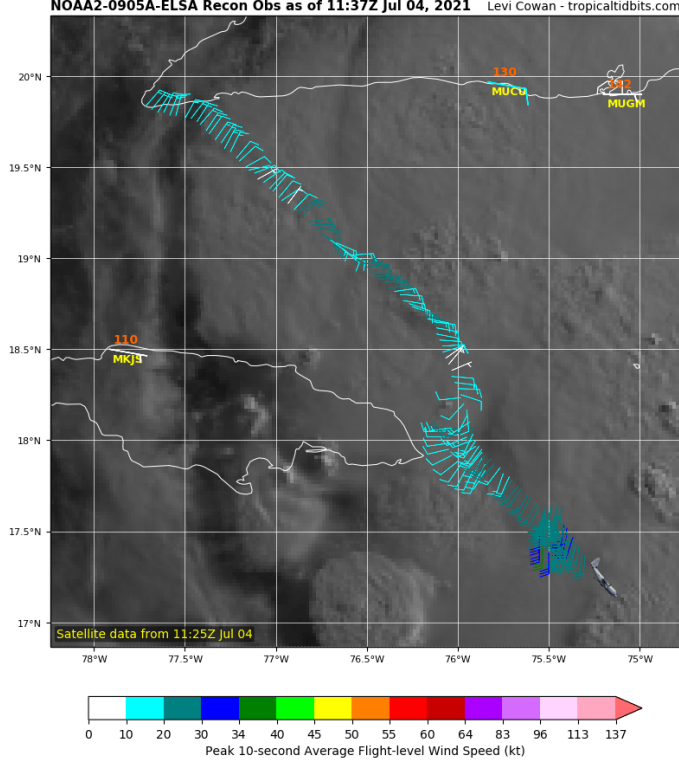
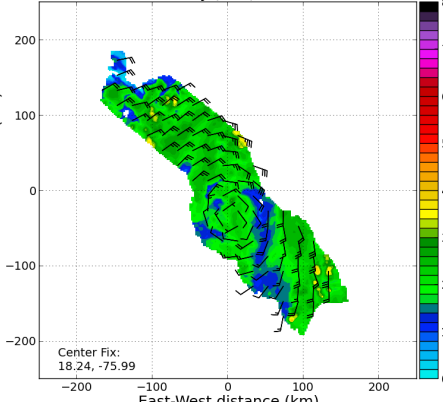
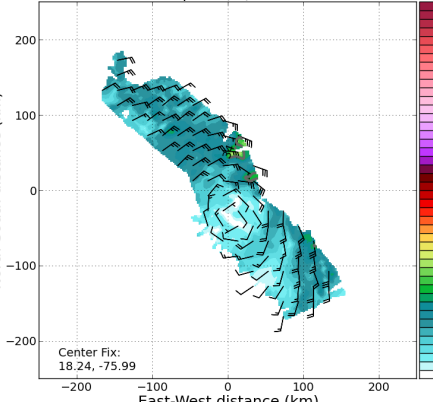
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	 <p>Fecha: 04/07/2021 Hora local: 07:10 am</p> <p>Maximos (Nexrad: LRM)</p> <table border="1"> <tr><td>Alcance</td><td>450 km</td></tr> <tr><td>Nivel inferior</td><td>1500 m</td></tr> <tr><td>Nivel superior</td><td>20000 m</td></tr> <tr><td>Celda</td><td>300 m / 1.4°</td></tr> </table> <p>Escala de intensidades</p> <table border="1"> <tr><td>80.0</td><td></td></tr> <tr><td>75.0</td><td></td></tr> <tr><td>70.0</td><td></td></tr> <tr><td>65.0</td><td>severo</td></tr> <tr><td>60.0</td><td></td></tr> <tr><td>55.0</td><td></td></tr> <tr><td>50.0</td><td>fuerte</td></tr> <tr><td>45.0</td><td></td></tr> <tr><td>40.0</td><td></td></tr> <tr><td>35.0</td><td>moderado</td></tr> <tr><td>30.0</td><td></td></tr> <tr><td>25.0</td><td></td></tr> <tr><td>20.0</td><td>débil</td></tr> <tr><td>15.0</td><td></td></tr> <tr><td>10.0</td><td></td></tr> </table> <p>INSMET Centro de Radares</p>	Alcance	450 km	Nivel inferior	1500 m	Nivel superior	20000 m	Celda	300 m / 1.4°	80.0		75.0		70.0		65.0	severo	60.0		55.0		50.0	fuerte	45.0		40.0		35.0	moderado	30.0		25.0		20.0	débil	15.0		10.0	
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1125z	 <p>GOES16 SWIR: 2021-07-04-1125 UTC G16 GLM Flash Count=309</p> <p>Weathernerds.org</p> <p>GLM shows a very linear line of lightning activity east of the center</p>																																						
1135z	Done circling and continuing ctr-SE leg																																						
1135z	Sonde #4: ctr-SE midpoint																																						

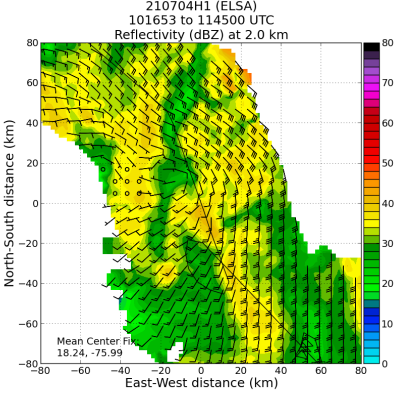
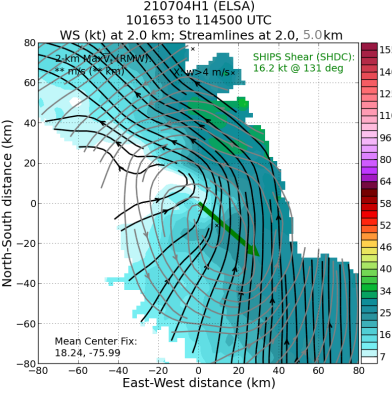
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<p>1137z</p>	<p style="text-align: center;">NOAA2-0905A-ELSA Recon Obs as of 11:37Z Jul 04, 2021 <small>Levi Cowan - tropicaltidbits.com</small></p>  <p style="text-align: center;">Peak 10-second Average Flight-level Wind Speed (kt)</p>
<p>1147z</p>	<p>Sonde #5: SE endpoint (sonde failed and not captured in TAG)</p>
<p>1150z</p>	<div style="display: flex; justify-content: space-around;"> <div data-bbox="446 1239 917 1701"> <p style="text-align: center;">210704H1 (ELSA) 101653 to 114500 UTC Reflectivity (dBZ) at 7.0 km</p>  <p style="text-align: center;">Center Fix: 18.24, -75.99</p> </div> <div data-bbox="941 1239 1404 1701"> <p style="text-align: center;">210704H1 (ELSA) 101653 to 114500 UTC Wind Speed (kt) at 7.0 km</p>  <p style="text-align: center;">Center Fix: 18.24, -75.99</p> </div> </div>

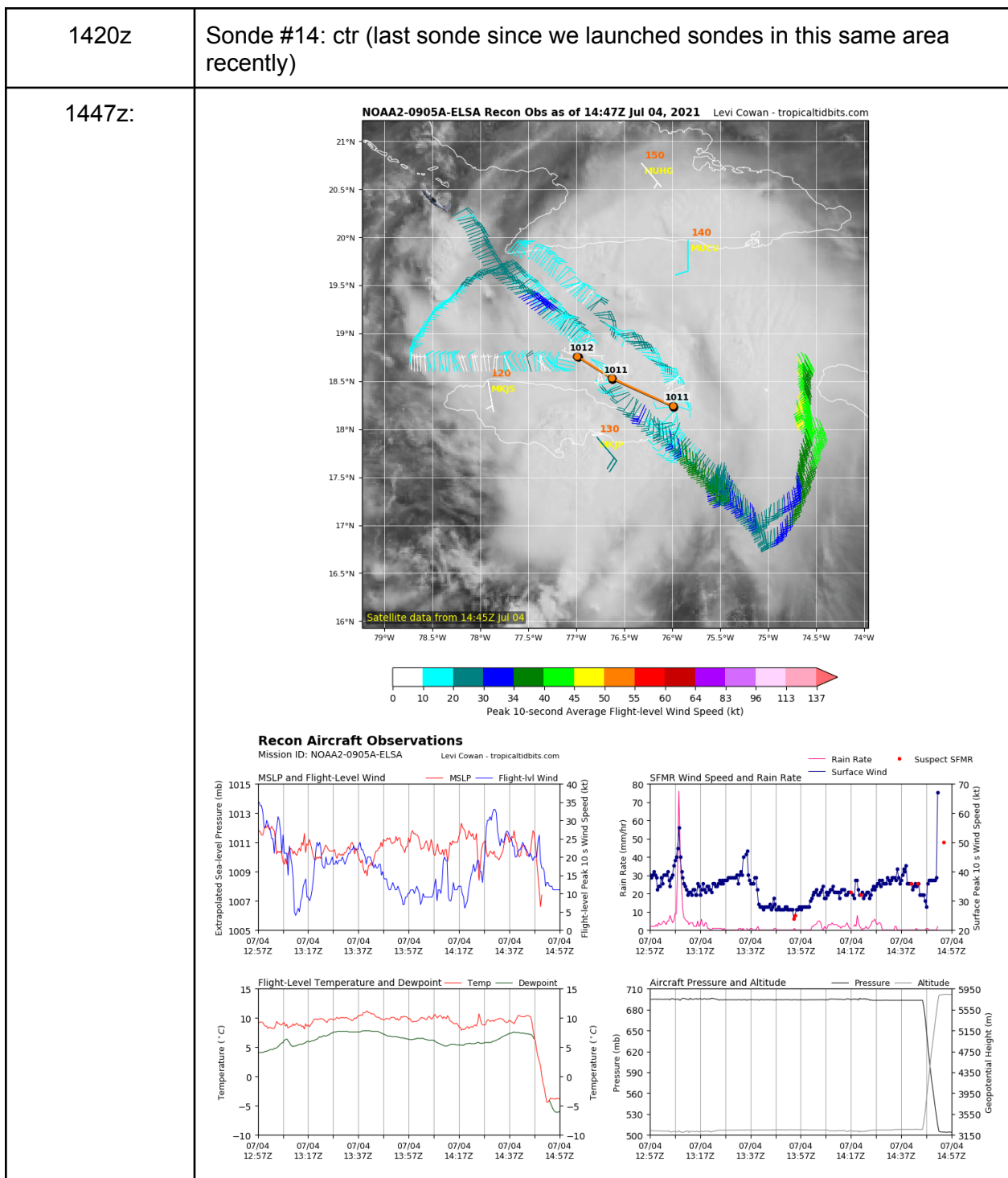
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	<div style="display: flex; justify-content: space-around;">   </div> <p>Good coverage on initial NW-SE pass. Elongated low-level center ~20 km NW of the mid-level (5km) center.</p>
1204z	Sonde #6: NE WP
1220z	FD reports that 42 is not finding a gap to cross the convective band (for an E-ctr-W leg) noted above in the GLM and radar images. That band appears to be more intense to the N and is jamming up against the Cuban coast (not able to set up a NW-ctr leg). New plan is for SE-NW pass with 105 nm legs
1245z	Sonde #7: SE WP
1250z	Talking to FD re: the rest of 42's pattern. 42 only has 1 flight engineer, so they are limited with their duration. After this SE-NW pass: NW-W downwind, W-ctr, ctr-NW (FP)
1257z	Sonde #8: SE-ctr mid
1312z	Sonde #9: ctr
1321z	Sonde #10: ctr-NW mid
1334z	Sonde #11: NW
1354z	Sonde #12: W
1407z	Sonde #13: W-ctr mid

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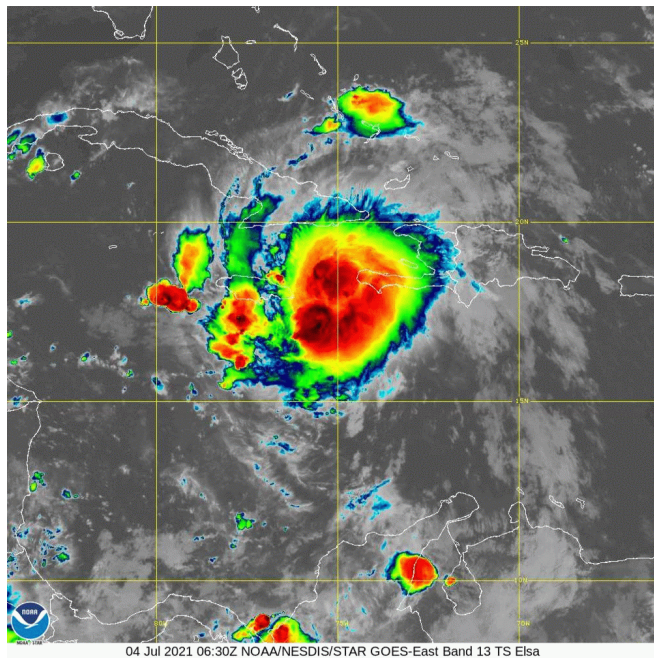
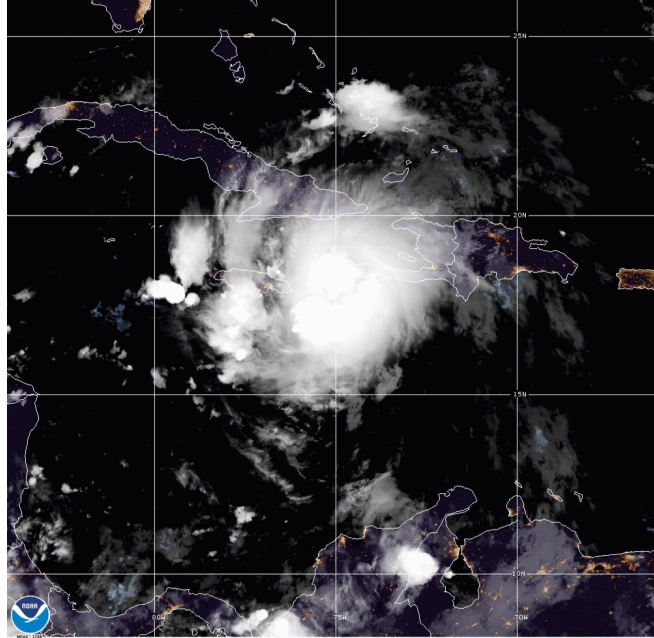
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0620-1440z



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POST-FLIGHT	
Mission Summary	<p>Successful NHC fix-EMC combination mission. NHC 1130z fix requirement was fulfilled, but the 1730z fix requirement could not be met due to crew rest requirements (NHC was aware of this pre-flight). 3 tail Doppler radar analyses were transmitted off the aircraft and 13 GPS dropsondes were transmitted to the GTS. Elsa weakened slightly during the mission and TDR data indicated that the vortex was tilted ESE with height. NHC mentioned use of NOAA 42's data in their 15z advisory:</p> <p><i>“Flight-level and SFMR surface observations from the aircraft indicate that the maximum winds are near 50 kt and the estimated central pressure, about 1009 mb, is rather high for a system of this intensity. Also, tail Doppler radar data from the aircraft show an eastward tilt of the center with height. Nonetheless, the storm still looks fairly impressive on satellite images with a well-defined convective banding feature over the northern through eastern portions of the circulation.”</i></p> <p>Due to weather hazard avoidance and proximity to land, the planned pattern had to be modified multiple times. 14 dropsondes were deployed, 1 sonde failed, and 13 were transmitted to the GTS (all sondes were charged to NWS).</p>
Actual Standard Pattern Flown	Rotated Figure-4 (heavily distorted due to weather hazard avoidance and land)
APHEX Experiments / Modules Flown	AIPEX
Plain Language Summary	<ul style="list-style-type: none"> • The NOAA P-3 flew this mission to determine Tropical Storm Elsa's location and intensity for NOAA NHC and to collect radar data for NOAA/National Centers for Environmental Prediction/Environmental Modeling Center's Hurricane Weather Research and Forecasting (HWRF) forecast model. • Elsa appeared to be disorganized this morning and the storm circulation was observed to be tilted with height. This tilting may be contributing to the slight weakening of the storm that was observed today.
Instrument Notes	The THOR instrument was not operational during this mission. All other aircraft instruments operated nominally.

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