Mission Summary
Hurricane Lili
Landfall/CBLAST
021003I Aircraft: 43RF

Scientific Crew:		**Aircraft Crew:**	
Chief Scientist	Peter Black	Cockpit:	CAPT Dave Tennesen,
			LCDR H Halverson,
Doppler Scientist	John Gamache		CDR Phil Kenul
Dropsonde Scientist	Sim Aberson	Navigator:	LCDR John Adler
Workstation:	Mike Black	Flight Director:	Barry Damiano
Laser altimeter	Joel Hazard		
Observer:	Chris Cappella	Engineer:	Jeff Smith,
SRA	Ed Walsh	Data Tech	Ray Tong
		Elctronics::	Damon Sans Souci

Mission Briefing:

After HAIRSIN and Ocean Winds flights in Hurricane Lili, HRD planned for a flight during Lili's landfall on the Louisiana coast. Mobile observing teams from Texas Tech University (TTU), Clemson, and University of Florida were heading for the Lousiana coast to deploy the SMART-R radar and several wind towers. They were joined late in the evening of 2 October by two portable Doppler radars from U of Oklahoma, DOW-2 and DOW-3. The HIRT team from North Carolina also drove an instrumented vehicle to the region south of New Iberia, Loisiana. We designed a flight plan that would include overflights of as many of these sites as possible. including GPS sonde drops just offshore of them. The fligh was planned to be ~8 h, to allow another 2h for CBLAST stepped descents in strong winds, sampling onshore and offshore flow, continuing the CBLAST filght pattern tests.

Mission Synopsis:

NOAA 43 left MacDill Air Force Base at 1302 UTC, and descended to 6,000' at the IP ~ 200 km SSE of New Orleans at 1420. For the next tow hours, the plane sampled the storm environment just along the coast, dropping 20 GPS sondes along the coast and near the wind towers, especcially the WEMITE tower on West Cote Blanche Island. Figure 1 shows the complete flight track, with sonde launch locations and portable observing sites. Figure 2a is an LF image from NOAA 43's initial pass through the center of Lili.

The CBLAST module began at 1623 when the aircraft descended to 900'. The plane flew an upwind and downwind pass at this altitude and then the aircraft descended to 600' for another leg.. At 1702 the plane turned and ascended to 2000' for a crosswind leg. Because of the numerous oil rigs with heights 200' to 300' the aircraft could not go below 600'. The crosswind legs were completed at 1740. Th aircraft climbed to 14,000' and then made one south to north pass through the center over land (Figure 2b), turning west towards Lake Charles and then turning SE to head back to base. NOAA 43 landed ar MacDill later tha day.

Evaluation:

This is probably the most complete data set collected in a landfalling hurricane (with the exception of the LCH radar data).Hurricane Lili has weakened considerably over night, yet some of the TTU towers measured hurricane-force winds. The wind towers measured winds in various exposures and environments and these data will be valuable for wind engineering studies. Preliminary examination of the Tail Doppler data show them to be free of noise problems.

The flight crew also further practised flying low-altitude patterns for the CBLAST experiment. One important finding was the difficulty of flying thes patterns near the Gulf Coast, because of the oil rigs.

Acknowledgements:

Barry Damiano, John Adler, and the flight crew flew a complicsted pattern with their usual dedication and attention to detail. Jeff Smith kept the radar running, and Ray Tong and Damon Sans Souci managed to

keep with our evolving plans for GPS sonde drops.

Problems:

The aircraft radar system was down from 1534 to 1543 UTC. The Lake Charles WSR-88D was only able to archive 4 volume scans during the entire episode, 2 at 0533 and 2 at 0900 UTC, 3 October. Several GPS sondes had no winds, but the wind data maybe be recovered by post-processing at AOC.

Tables:

Table 1. Some Centers

Time	Lat	Lon	
0900	27° 42′	91° 42′	NHC Official
1500	29° 50′	92° 16′	Air Force radar center
1516	29° 52′	92° 18′	NOAA 43
1806	30° 31′	92° 27′	NOAA 43

Table 2. GPS Sondes

#	id	time	location (launch)
1	014335072	142338	28.55° 89.00°
2	014415035	142852	28.60° 89.38°
3	014335070	143414	28.64° 89.77°
4	014335076	143904	28.71° 90.13°
5	014335036	144408	28.83° 90.50°
6	014335074	144905	28.95° 90.86°
7	014335073	145404	29.08° 91.21°
8	014515063	145905	29.22° 91.55°
9	014515062	150046	29.26° 91.67°
10	014515060	150525	29.45° 91.96°
11	014515058	150837	29.67° 92.10°
12	014515056	153159	29.00° 92.33°
13	014335095	153458	29.15° 92.13°
14	014515065	153803	29.31° 91.92°
15	014335025	154136	29.49° 91.67°
16	014335078	154404	29.62° 91.74° no winds
17	014515061	154548	29.67° 91.87° no winds
18	014335049	155818	29.64° 91.76°
19	014515010	155938	29.68° 91.86° no winds
20	014515121	160407	29.56° 92.05°

Several of these sondes had late launch detects and late winds.

Table 3. AXBT

Launch (UTC)	Lat	Lon	SST (°C)
1434	28° 39′	89° 31′	

Table 4.Locations of mobile intruments deployed during the landfall

Latitude	Longitude	Location
30* 12’ 27.72"	91* 59’ 23.64"	SMART-R Lafayette Regional Airport
30* 02’	91* 54’	DOW3 Acadiana Airport (New Iberia)
30* 42.5’	92* 06.5’	DOW2 St Landry Parish Airport (Opelousas)
30* 05.08’	91* 00.37’	Clemson/U Fla near Cane Air Field
29* 54.84’	91* 45.56’	" New Iberia
30* 22.07’	91* 05.53’	" S of Baton Rouge
30* 12.88’	92* 02.68’	" Cajun Field, Lafayette
29* 55’ 06.3"	92* 14’ 50’	TTU tower at Old Harrington Landing Field
29* 55’ 07"	92* 14’ 45.9"	TTU tower 2 " " (near Cow Island)
29* 45’ 4.62"	91* 43’ 30.36"	TTU Wemite # 2, W. Cote Blanche Island (30’ salt dome)
30* 01’ 48.96"	91* 52’ 40.74"	TTU tower Acadiana Airport
29* 42’ 32"	91* 20’ 40.2"	TTU 3m tower at Williams Memorial Airport
29* 42’ 48.5"	91* 20’ 9.8"	TTU 3m Tower 2 at " " " (near Patterson)
31° 10’ 40"	92° 24’ 38"	LAIS Dean Lee (E of Woodworth, LA)
30° 14’ 28"	92° 20’ 51"	LAIS Rice (E of Crowley, LA)
29° 57’ 54"	91° 42’ 54"	LAIS Iberia (NW of Jeanerette, LA)
29° 59’ 08"	91° 04’ 45"	LAIS Paincourtville (W of Paincourtville, LA)
29° 26’ 28.2"	92° 03’ 40.8"	CSI-3
29° 10’	90° 35’	CSI-11
29° 03.2’	90° 32’	CSI-5
28° 52’	90° 29’	CSI-6

Some locations were supplied by the teams, others were read off of aeronautical chart CH-24.

TTU - Texas Tech University Wind Engineering

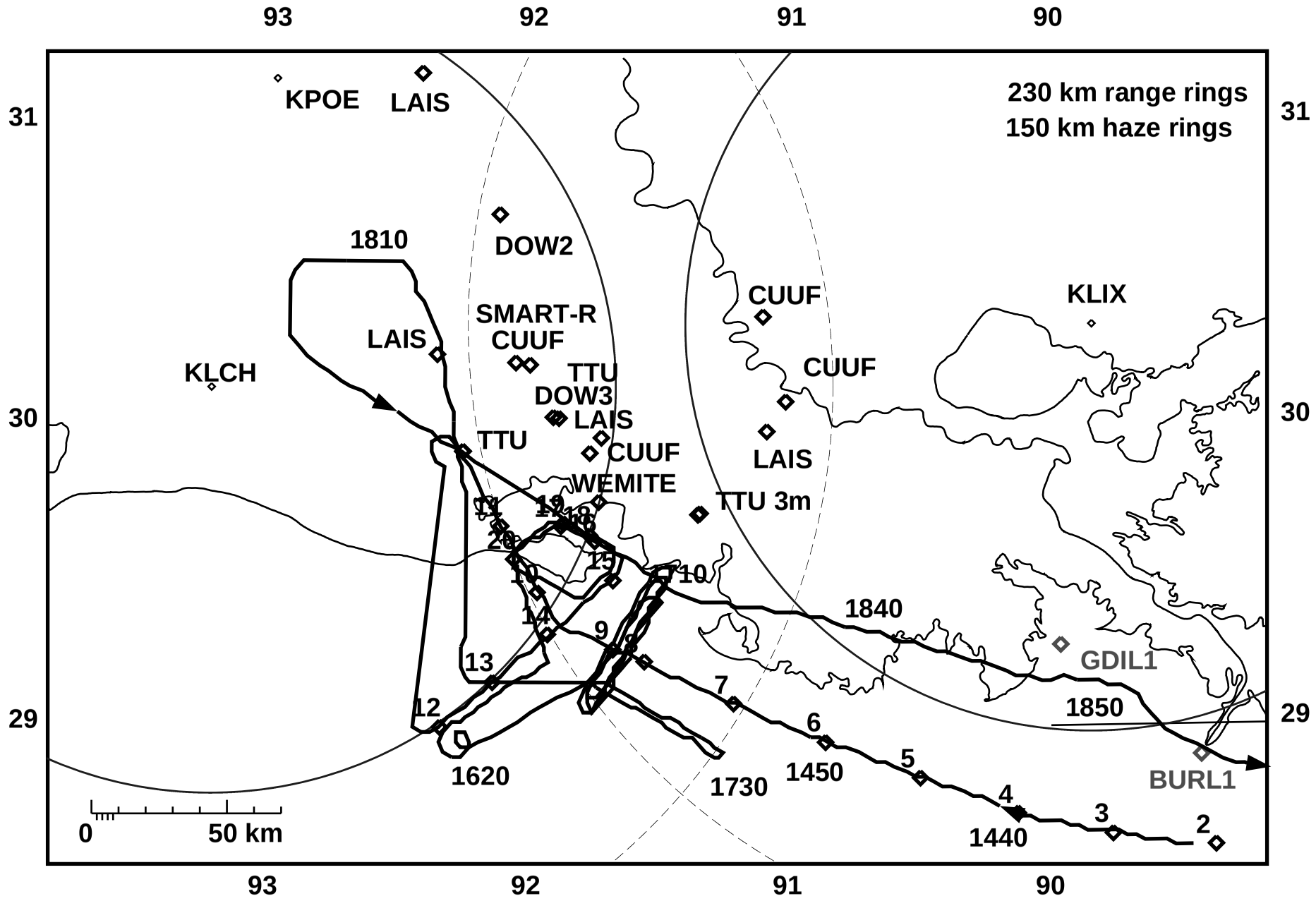
LAIS: Louisiana Agroclimatic Information System

CIS: WAVCIS-LSU Coastal Studies Institute

Figures:

1. NOAA 43RF flight track. (lili_landfall_map.ps) The map shows the fligh track and the location of the portable surface stations.

2 Lower Fuselage radar images (lili_1003_lf_images.ps) These two images are single-sweep PII’s form NOAA 43 lower-fusealge radar at 1518 and 1808 UTC, 3 Octoberr 2002, when the aircraft was near the eye. Note that at 1518 the aircraft was at 6,000’ while at 1808 the aircraft was flying at 14,000’. When the aircraft is higher the ground clutter extends further out.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92
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31
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29
KPOE
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230 km range rings
150 km haze rings
1810
DOW2
SMART-R
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LAIS
KLCH
TTU
DOW3
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WEMITE
TTU 3m
CUUF
KLIX
CUUF
LAIS
1840
GDIL1
1850
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1620
1730
1450
1440
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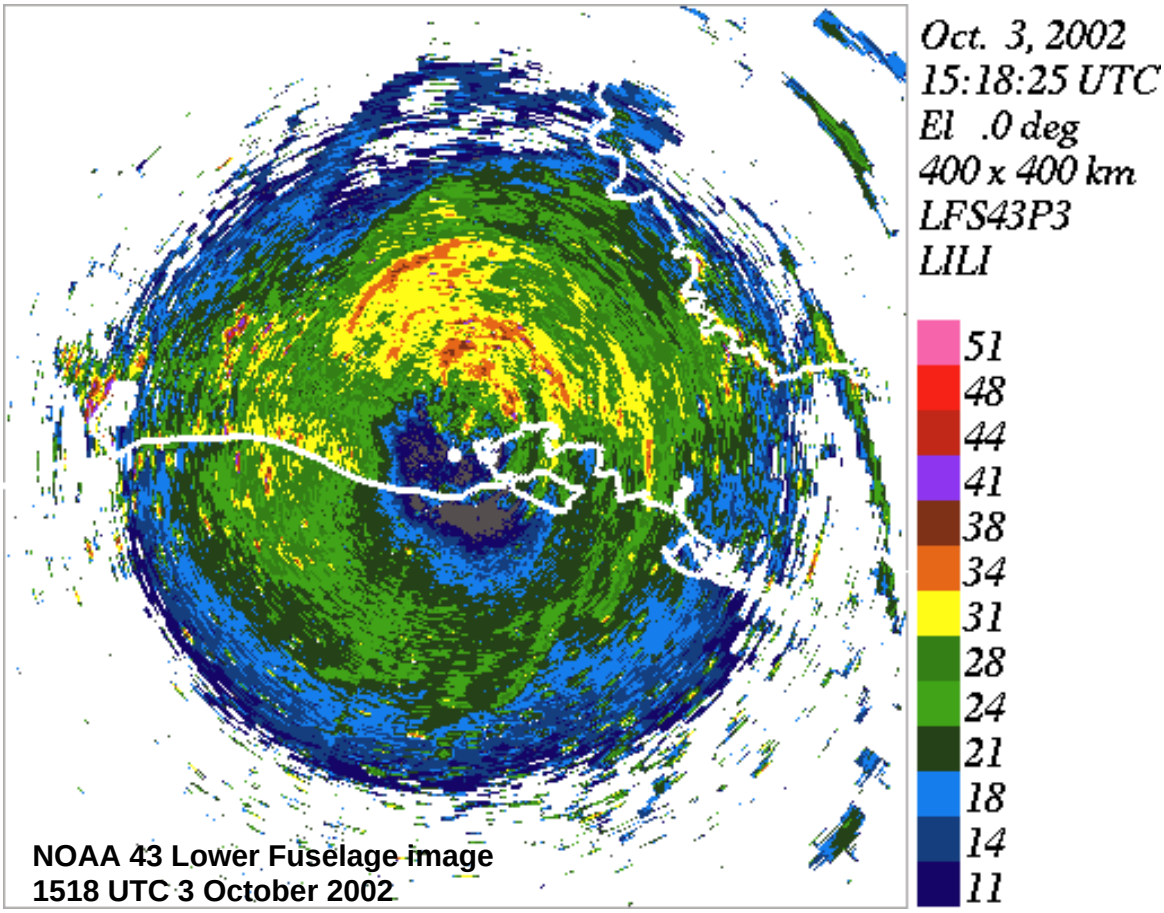
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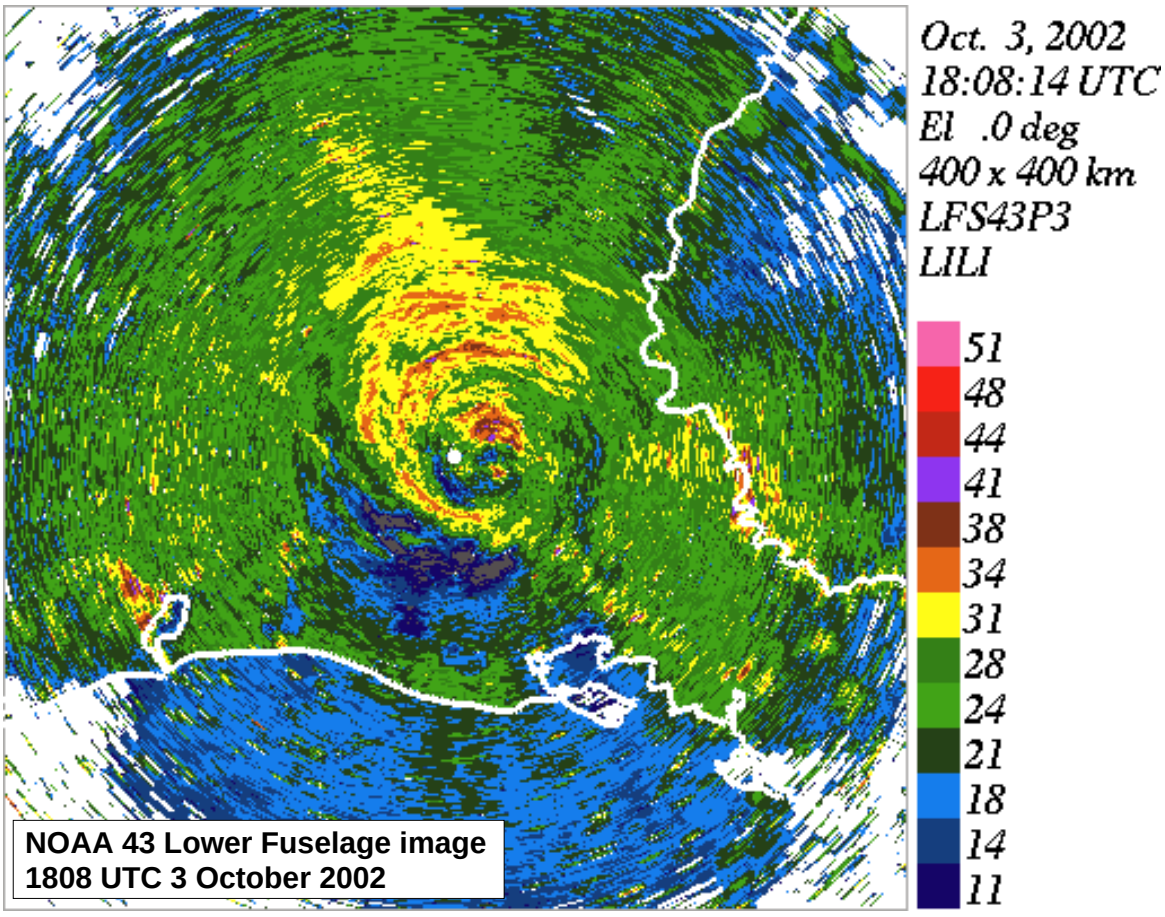
NOAA 43 Lower Fuselage image
1518 UTC 3 October 2002


Oct. 3, 2002
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NOAA 43 Lower Fuselage image
1808 UTC 3 October 2002