Lead Project Scientist

Date 9/3/19 **Flight ID** 190903H1

Storm or Project Dorian **Experiment name** TDR/SEF/OceanWinds

Mission ID

~~**Pre-flight**~~

- [x] 1. Participate in general mission briefing.
- [x] 2. Determine specific mission and flight requirements for assigned aircraft.
- [x] 3. Determine from AOC flight director/meteorologist whether aircraft has operational fix responsibility and the mission designation.
- [x] 4. Contact HRD members of crew to:
  a. Assure availability for mission.
  b. Review field program safety checklist
  c. Arrange ground transportation schedule when deployed.
  d. Determine equipment status.
- [x] 5. Meet with AOC flight director and navigator at least 3 hours before take-off for initial briefing.
- [x] 6. Meet with AOC flight crew at least 2 hours before take-off for crew briefing. Provide copies of flight requirements and provide a formal briefing for the flight director, navigator, and pilots.
- [x] 7. Report status of aircraft, systems, necessary on-board supplies and crews to Field Program Director.
- [x] 8. Before take-off, brief the on-board GPS dropsonde operator on times and positions of drop times.
- [x] 9. Make sure each HRD flight crew member has a life vest.
- [x] 10. Perform a headset operation check with all HRD flight crew members. Make sure everyone can hear and speak using the headset.

In-Flight

- [x] 1. Confirm from AOC flight director that satellite data link is operative (information).
- [ ] 2. Confirm camera mode of operation.
- [x] 3. Confirm data recording rate.
- [ ] 4. Complete Lead Project Scientist Form.
- [x] 5. Check in with the flight director to make sure the mission is going as planned (i.e. turns are made when they are supposed to be made).

Post-flight

- [x] 1. Debrief scientific crew.
- [x] 2. Gather completed forms for mission and turn in to data manager at HRD.
- [x] 3. Obtain a copy of the 10-s flight listing from the AOC flight director. Turn in with completed forms.
- [x] 4. Obtain a copy of the radar DAT tapes. Turn in with completed forms.
- [x] 5. Obtain a copy of serial flight data on thumb drive. Turn in with completed forms.

[**Note**: all data removed from the aircraft by HRD personnel should be cleared with the AOC flight director.]

- [ ] 6. Report landing time, aircraft, crew, and mission status along with supplies (tapes, *etc.*) remaining aboard the aircraft to Field Program Director
- [x] 7. Determine next mission status, if any, and brief crews as necessary.
- [ ] 8. Notify Field Program Director as to where you can be contacted and arrange for any further coordination required.
- [x] 9. Prepare written mission summary using **Mission Summary** form.

Lead Project Scientist Check List

Storm or Project Dorian **Experiment name** TDR

Flight ID 190903H1 ~~**Mission ID**~~

A. Participants:

Function	Participant	Function	Participant
Lead Project Scientist	Rogers	Flight Director	Holmes
Radar	Dunion	Pilot	Didier
Workstation	—	Pilot	
Cloud Physics	—	Navigator	Freeman
Dropsonde	Dahl	Systems Engineer	Lynch
Dropsonde		Data Technician	Nacher
AXBT/AXCP	—	Electronics Technicians	
Observer/Guest	Chang / Ocean Winds		
Observer/Guest		Flight Engineer	

B. Take-off and Landing Times and Locations:

Take-Off: 0741 UTC Location: KLAL

Landing: 1459 UTC Location: KLAL

Number of Eye Penetrations: 5

C. Past and Forecast Storm Locations:

Date/Time	Latitude	Longitude	MSLP	Maximum Wind
/				
/				
/				
/				
/				

D. Mission Briefing: Conduct TDR mission into Hurricane Dorian. Dorian has been essentially stationary over Grand Bahama, about 100 nm east of FL coast, for the past ~24h. Storm has steadily weakened since a peak intensity of ~911 mb, with current intensity ~950 mb. Evidence of secondary eyewalls during previous mission, plus possible land influence from FL peninsula, may be responsible for weakening.

Rot. Fig-4 pattern, IP on W, FP on NE. 105 nm legs, except shortened as needed b/c land. Fly 10 kft to start, descend to 8 kft once AF arrives. Upon completion, set up for possible SFMR module, starting on SE, similar to what was done at 4pm. Otherwise ocean winds.

Storm or Project Dorian **Experiment name** TDR

Flight ID 190903H1 **Mission ID**

E. —Equipment Status (Up **U**, Down **D**, Not Available **N/A**, Not Used **O**)

Equipment	Pre-Flight	In-Flight	Post-Flight	# DATs / CDs /Expendables/ Printouts
Radar/LF	U			
Doppler Radar/TA	U			
Cloud Physics	N/A			
Data System	U			
GPS sondes	U			
AXBT/AXCP	N/A			
Ozone instrument	N/A			
Workstation	N/A			
Cameras	U			

REMARKS:

Lead Project Scientist Event

Date **Flight ID** **LPS**

Time	Event	Position	Comments
0741	takeoff	KLAL	
0815	IP, drop 1	W IP, 105 nm W of	for FL 22, sf 20 m/s
0826	drop 2	W midpt	FL 37, sf 29 m/s
0828	obs	inbound from W	eye open on S side,
			poss. by shear signature
0835	drop 3, center	26.8N 78.43W	S of actual center
0841	obs	E eyewall	peak fl 60, sf [redacted]
0848	obs	~50nm E	going through outer
			band, while this is target for SE fundy
			mixed convective & strat.
0854	obs	~80nm E	FL winds show
			signature of outer wind max
0848	drop 4	E midpt	
0900	drop 5	E endpt	FL 30, sf 15 m/s
0916	obs	downwind of NE	widespread banding
			features here, sloppy side
			of storm (DSL)
0937	drop 6	N endpt, 105 nm	FL 29, sf 20 m/s
0942	obs	inbound from N	mostly stratiform precip
			here, at connecting portion, where
			you'd expect stratiform
0952	drop 7	N midpt	FL 45, sf 35
0954	obs	near N eyewall	clear indication of
		outer eyewall	in FL, sf winds
0958	drop 8	N eyewall	FL 55, sf 48 m/s
1002	obs	in eye	distinct signature of
		outer eyewall on N side,	more pronounced than on

east side, suggests azimuthal variation in outer eyewall signature

26 0835
78.39
0835

Lead Project Scientist Event

Date 9/3/19 **Flight ID** 190903H1 **LPS** Rogers

Time	Event	Position	Comments
1017	obs	~50 nm S of eye	on the south side,
		near [redacted] upwind side of band, much	
		more cellular convective	
1018	drop 9, S mid	55 nm S, midpt	FL 30, SF 23 m/s
1032	drop 10, Send	105 nm S	
1043	obs	downwind leg	impressive structure
		on radial profile on E side. Radial flow, wind speed,	
		vertical velocity all show	signature of secondary
		eyewall. Region of subsidence also shows possible MDI.	
1056	drop 11, SE end	SE endpt	FL 30, SF 17 m/s
1108	obs	inbound SE leg	going through band on SE, more cellular convective
1111	drop 12	midpt SE	FL 43, SF — (land)
1120	obs	in eye	peak FL ~110 kt, no SF
1136	drop 13	midpt [redacted]	FL 38. SF 27 m/s
1140	obs	outbound NW	radar analyses from
		N-S leg shows clear outer wind max on N side.	
		Deep inflow on S side. Is that OSR? what direction	
		is shear vector?	
1150	drop 14	endpt NW	FL 24, SF 5 m/s
1208	obs	downwind leg along	SF windy slowing
		beach	around 45-50 kts
1221	drop 15	endpt SW	FL 24 SF 22 m/s
1230	drop 16	midpt SW	FL 43 SF 25 m/s
1234	obs	eye	completely open eyewall on SW,
			45 m/s, limited SF
1238	drop 17	center	
1250	drop 18	midpt NE	FL 40, SF 33 m/s;
			peak FL winds NNE
			52, SF 44 m/s

27 4
28 27
1122
27.14
28.48

Lead Project Scientist Event

Date 9/3/19 Flight ID 190903H1 LPS Rogers

Time	Event	Position	Comments
1256	obs	outbound	passed through downwind
			edge of band, mostly strat,
			showed up as outer wind max
			in FL, weakly in SF data
1304	drop 19		No GPS
1305	drop 20	NE endpt	FL 60 SF 20 m/s
		finished survey pattern, now setting	
		up SEF module. Get back to ctr, head	
		out along 180.	
1328	drop 21	RMW NESDIS	
		sonde N RMW	
1313	pattern	NNE of ctr	begin inbound leg to setup for module
1331	drop 22	NNE ctr NESDIS	
1347	drop 23	~50nm SSW of ctr	begin SEF module, drop 1
	drop 24		drop 2 of module
1359	drop 25		drop 3 of module
1403	drop 26		drop 4 of module
1408	drop 27		drop 5 of module
1412	drop 28		drop 6 of module, end of module

Mission Summary

Scientific Crew (42RF)
Lead Project Scientist Rogers
Radar Scientist Dunion
Cloud Physics Scientist
Dropwindsonde Scientist Dahl
Boundary-Layer Scientist
Workstation Scientist
Observers (affiliation)

Mission Briefing: (include sketch of proposed flight track or page #)

See previous

Mission Synopsis: (include plot of actual flight track)

mission was flown as planned. (# in fig. 4, ended upon NE side. Then went back in, outbound to 190. Set up in moat region, flew over 180 degrees around east side of storm, Module was excellent. Total of 28 sondes released, including 6 in module and 2 NE SOPS drops.

Evaluation: (did the experiment meet the proposed objectives?) Mission was a success. A total of 5 TDR analyses produced, and 28 sondes, with a minimal number of failures. SFP module was great too. Storm evolving rapidly, first passes showed clear outer eyewall ~55 nm, and clear eye on sat, but asymmetric eyewall on radar, clearly westerly shear impacting system. By time of outbound radius had shrunk to ~35 nm and eye had filled in on satellites. Perhaps eyewall replacement & impacts of shear? Data collected should yield insight on this evolution, and especially 12-h evolution when comparing w/ previous mission.

Problems: (list all problems)

No real problems, other than a few sonde failures.

Expendables used in mission:

	Deployed	Good	Bad
GPS sondes :	28	25(?)	3(?)
AXBTs :	—	—	—
Sonobuoys:	—	—	—
UAVs	—	—	—