

## SARP-East Science Flight Report

2017-07-19

OWLETS Flight #1

Pilots: Rich Rogers, Alan Barringer

Mission Scientist: Glenn Wolfe

Science Crew: Thomas Hanisco, Sally Pusede, Jessica Munyan, Don Blake, Brenda Biggs

NASA Interns: Brett Poche, Hakeem Bisyr, M. Faran Haider

### Objectives:

- 1) Characterize horizontal land-water gradients in ozone and related species
- 2) Characterize vertical chemical gradients in vicinity of O3 lidars and Pandora spectrometers
- 3) Sample outflow from Hopewell industrial complex

### Meteorology (from ground stations, averaged over flight):

Location	T (F)	RH (%)	WDIR	WSPD (mph)	Clouds
WFF	85	72	S	13	CLR
Norfolk	88	65	E - SE	8	SCT
Richmond	94	40	S	7	SCT

### Summary:

Takeoff as scheduled. First spiral over wrong island due to flight planner error; fixed in subsequent passes. Operations over Langley complicated by ATC, military aircraft and clouds, and spiral was wider than desirable. Potentially land-water gradients in CO2 and ozone observed during low-level run up James River. Elevated CH4 and N2O observed East of Hopewell, likely due to wastewater treatment operations. Elevated O3 and NOx observed NW of Hopewell, likely due to Richmond urban outflow and/or Chesterfield Power Station (coal). Relatively clean air observed during the southern leg, except for a broad enhancement in CH4 that may be agriculture-related. Second set of spirals at CBB and CAP much better. Second spiral at VCU offset from Pandora site. Potential minor land/water gradients in ozone observed during Northern return leg over Chesapeake Bay. All objectives met. Flight planner needs to be ~20% more conservative in timing estimates. Ozone mixing ratios for flight ranged from 40 to 70 ppb.

### Instruments:

All instruments performed well. Headset issues complicated communications between Mission Science and WAS, possibly leading to a lost sample opportunity over Great Dismal. Issue resolved by Sherpa mechanic Bill Z. on following morning.

### Events:

Time (UTC)	Event	Time (UTC)	Event
18:02	Takeoff	20:20 – 20:26	Ocean
18:28 – 18:44	CBB spiral	20:28 – 20:43	CBB spiral
18:55 – 19:03	CAP spiral(ish)	20:48 – 20:55	CAP spiral
19:03 – 19:17	James R. land/water	21:09 – 21:13	VCU spiral
19:18 – 19:30	VCU spiral up	21:22	FYJ missed approach
19:30 – 19:38	VCU spiral down	21:38	Tangier missed approach
19:43 – 19:48	Hopewell loop	21:51	Land
20:08 – 20:11	Great Dismal swamp		

