

The Ontario Winter Lake-effect Systems (OWLeS - 2013/2014)

University of Wyoming King Air Research

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<i>Post-project notes</i>					
21 Oct 2014	Reprocessed data. Corrected the Cloud Droplet Probe (CDP) channels, they were off by one. Refined the processing for the LWC-100 hotwire liquid water probe.				
Date/Gnd Notes	Flight # (*.kml)	Status	Times (UTC)	Hours	Crew/Notes
29 Jan	RF21	Racetrack pattern through band over Lake Ontario	1712-1928	2.4	A Bandani S Steiger L Oolman M Matott
28 Jan	RF20	Fly north/south legs through band coming off Lake Ontario.	1728-2117	3.9	A Bandani D Kristovich L Oolman P Eck
Jan 27	RF19	Multiple stacks through band down wind of Lake Ontario and Lake Huron.	2010-0017	4.2	A Bandani G Young L Oolman C Crossett
		North/south legs through	1154-		A Bandani D Kristovich

Order OWLeS Data

- King Air 1 Hz files
- King Air high rate 25 Hz files
- Optical array probes 2D images
- Wyoming Cloud Radar Level 1
- Wyoming Cloud Radar Level 2
- Wyoming Cloud Lidar

User Information

- Planning Chart
- EOL Facilities
- Software Repository

Jan 26	RF18	dissipating band over Lake Ontario	1511	3.4	L Oolman J Fowler
Jan 23	RF17	Study the boundary layer development over Lake Ontario from flow that came from Georgian Bay.	2210-0145	3.6	A Bandani D Kristovich L Oolman K Rutt
Jan 22	RF16	Downwind persistence pattern over Finger Lakes. Had trouble with the brakes freezing and needed to replace two tires after the mission.	1401-1750	3.9	A Bandani B Geerts L Oolman Z Xu
Jan 20	RF15	Downwind persistence pattern over the Finger Lakes.	1838-2237	4.1	A Bandani G Young L Oolman M Charnick
Jan 19	RF14	Flight over eastern Lake Ontario and Tug Hill. Climbed above clouds because of problems with icing. Lost the LWC-100, CDP, and 2D-P due to the ice.	2241-0148	3.2	A Bandani P Bergmaier L Oolman A Janiszski
Jan 18	RF13	Finger Lakes flight. Radar crashed at 1751. No other know instrument issues.	1728-2120	4.0	A Bandani D Kristovich L Oolman J Mulholland
Jan 16	RF12	Flew two stacks off shore between Rochester and Niagra. No known equipment issues.	0017-0257	2.8	A Bandani D Krisovich L Oolman C Hecht
Jan 12	RF11	Orographic uplift flight extending to the Adirondacks. LWC-100 values are suspect for	1216-1532	3.4	A Bandani B Geerts L Oolman

-  Projects & Data Requests
-  Planning and tracking tools
-  Facility User's Guide

Facility Instruments

-  In Situ
-  Wyoming Cloud Radar
-  Wyoming Cloud Lidar

Contact

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		much of the flight.			D Welsh
Jan 09	RF10	LLAP pattern with cross wind legs over eastern Lake Ontario and Tug Hill. The 2D-P was iced over 1420-1457. The CDP was iced 1421-1424. Numerous scrambled radar beams.	1251-1607	3.3	A Bandani B Geerts L Oolman P Bergmaier
Jan 08	RF09	Sample lake effect boundary layer from Lake Ontario as it grew up into air modified by Lakes Erie and Huron. Flew a series of legs over western Lake Ontario.	1618-2009	4.0	A Bandani G Young L Oolman D Welsh
Jan 07b	RF08	Second of two flights over eastern Lake Ontario and the coast. AIAS and DPR measurements bad, probably water in the nose boom. Processed with BIAS. 2D strobe rate is also incorrect. There was also a series of accelerometer and gyro errors from the Applanix from 2035 until 2101 UTC.	1905-2259	4.0	A Bandani P Bergmaier L Oolman D Welsh
Jan 07a	RF07	Downwind persistence from Lake Ontario. AIAS values bad after 1628. The flight was processed using BIAS. The 2D image strobe rate is controlled by the TAS so the images are also bad	1311-1645	3.3	B Wadsworth B Geerts L Oolman P Bergmaier

		after this time.			
Jan 06	RF06	Downwind persistence from Lake Erie. Possible frosting of lidar windows at times.	1825-2141	3.7	A Bandani G Young L Oolman D Welsh
Dec 15	RF05	Long Axis band, focusing on eastern side and north of Tug Hill. Flight took place after sunset planning 530 PM local takeoff. Heavy snow and blowing before start, brakes frozen, delayed ~20 minutes for clearance. Encountered constant moderate rime buildup at 10 kft on 'near cloud top' legs. At 6 kft, icing was spotty with ~1.25 g/m ³ in isolated cu band clouds over water. INSTRUMENT: CIP & 2DP down for portions of flight, LWC100 down for most of flight (all icing). AIAS got water ingestion early into flight. Winds from AIAS suspect. Noseboom blown out after flight. No other known instrument issues.	2254 - 2609	3.6	B Wadsworth B Geerts J French P Bergmaier
		Long Axis band, focusing on eastern side and north of Tug Hill. Flight took place after sunset with 530 PM local takeoff. Similar conditions as RF04 regarding deep ice cloud and tops for convective	2246 -		B Wadsworth S Steiger

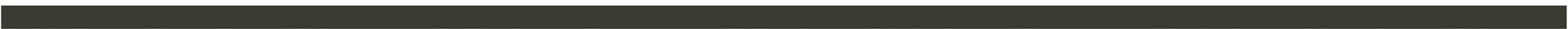
Dec 12	RF04	band. Again encountered LWCs up to ~ 1 g/m ³ and Ws of ~10 m/s. Applanix required several re-initialization during the first 60 minutes. Applanix data is suspect during this period. No other known Instrument Issues.	2016	3.6	J French C Johnston
Dec 11	RF03	Long Axis band, focusing on eastern side and over Tug Hill. Well defined band on the radar that set up shortly after our arrival on station. Lots of ice cloud present up to about 16 kft, that the band was imbedded within. Difficult to impossible to see the band visually, but well defined on NEXRAD. Unable to conduct flux leg because of visibility. Worked legs at 10.5 kft (band top) and ~6000 ft (band mid-level) and a bit at 3600 ft. Max LWCs of 1 g/m ³ , Ws of 10 m/s. No known Instrument Issues.	1801 - 2138	3.7	B Wadsworth S Steiger J French P Bergmaier
Dec 10	RF02	Downwind persistence of Lake Eerie. Executed 3 N-S legs, each at 3 different altitudes (above cloud, mid-cloud, lowest IFR). Issues with WCR on startup, but worked fine during flight. No known Instrument	1639 - 2018	3.7	B Wadsworth G Young J French P Bergmaier

		Issues.			
Dec 07	RF01	<p>First research flight-- Along wind pattern, 270 deg, translated south a few miles. Less of a 'band' structure--a bit more widespread and showery. Executed one flux leg, cross-wind at 500' AGL, then 5 cross wind legs above cloud (moving east) and 5 cross wind legs in cloud (moving back west). Followed with one alongwind leg in cloud. Licor dewpoint looks OK, Chilled mirror too low? AIAS likely had some water ingestion later in the flight and needs to be blown out prior to next flight.</p>	1634 - 2006	3.7	<p>B Wadsworth S Steiger J French G Young</p>

Test Flights

Jan 05	TF04	Pilot familiarization flight and test of repaired radar oscillator. Flew four legs over Lake Ontario.	1627 - 1840	2.1	<p>B Wadsworth A Bandani L Oolman D Welsh</p>
Dec 05	TF03	<p>First test flight in NY. exercised most of a long-wind pattern and some portion of a down-wind persistence pattern. Got into cloud; tweaked alignment on down lidar. Licor was calibrated prior to flight--calibration did not look good during</p>	1640 - 1927	2.9	<p>B Wadsworth P Wechsler J French B Liu</p>

		flight--will calibrate again prior to next flight.			
Nov 19	TF02	All issues from first test flight were addressed prior to TF02. No known issues with instruments for TF02. Licor requires a calibration after arrival in NY. Some limited liquid water--looks like cloud probes are working OK.	1914 - 2020	1.8	B Wadsworth L Oolman B Glover J Sulskis
Nov 13	TF01	All instruments were on aircraft for testing. CIP computer was not communicating with probe, so no CIP data. PSP up was not working due to broken wire (fixed after flight). Lidars/radar worked well--downward lidar was aligned beginning of flight. Conducted radar circles.	2107 - 2234	1.5	B Wadsworth B Glover J French Z Wang
Flight Hours		As of Jan 29, 75.2 out of 75 research hours were flown, -0.2 remain.	Test: 8.3		



OWLeS Post Mission Report

Jan 29, 2014

1. Crew: Bandani, Scott Steiger, Larry Oolman, Molly Matott
2. Pre-Flight Brief: 1100
3. Planned T/O time: 1200
4. Flight Time: 2.4 Hrs
5. Weather: VMC for T/O, VMC for Landing, windy.
6. Lowest cloud deck: 2800' layered to 8000' over the working area

A. Brief:

Briefed mission for LLAP flight.

B. Execution:

Track's graphic depiction was e-mailed to all agencies. ICAO flight plan filed. Received clearance from El Mira tower via phone. Departed KPEO runway 19 at 1230 via the GIBBE fix and climbed to 6000'. Reaching the coast line descended to 3000'. Reaching the point climbed to 8000' flew the track at 8000', 4000', and 2800' MSL. Once complete received clearance to KPEO for a RNAV 1 approach.

Discussion:

PR campaign a huge success! Including our own students; 12 students from five different institutions got to experience the mighty N2UW up close and personal.

OWLES RF21 (2014-01-29)

Ahmad Bandani, Scott Steiger, Larry Oolman, Molly Matott

Mission: Fly racetrack pattern through band over Lake Ontario

1712 Take off, Applanix OK, climb to FL060. The inversion is at 850 hPa.

1728 FL060, T=-19, DP(Licor)=-24, wind=275(true) @ 47 kt.

1733 Descend to FL030, cloud top at 5000 ft

1735 Over lake and just above cloud base.

1738 FL030, T=-18, DP=-20, wind=250 @ 34 kt

1746 Climbing

1750 FL080, T=-21, DP=-24, wind=270 @ 50 kt

1752 Northbound

1757 Done with line, T=-23, DP=-24, wind=260 @ 40 kt. From WCR, echoes 13000 ft msl to surface

1800 Southbound 5 nmi to west.

1805 Done with leg , on 1800 nexrad image, there is a swirl just to west, could just be from the pixilation of the data.

1808 Descending, cloud top FL068, lwc up to 0.4 gm/m3

1811 Northbound, FL040. T=-19, DP=-20, wind=260 @ 42 kt

1817 Done with line

1823 Southbound

1828 Done with leg

1830 Descend

1833 Northbound, FL028

1835 T=-16, DP=-17, wind=250 @ 45 kt. Pockets of LWC to 0.3 gm/m3

1837 7 m/s updraft

1841 Done with leg

1845 Southbound

1847 CDP conc over 2000 cm-3

1850 Done with leg

1852 Done with mission, climb to FL060 and head to PEO. Cloud top FL057.

1857 WCR echoes no longer continuous to surface.

1928 Land

OWLeS Post Mission Report

Jan 28, 2014

1. Crew: Bandani, David Kristovich, Larry Oolman, Pamela Eck
2. Pre-Flight Brief: 1100
3. Planned T/O time: 1200
4. Flight Time: 3.9 Hrs
5. Weather: VMC for T/O, 3800' layered to 5000', VMC for Landing, windy.
6. Lowest cloud deck: 3600' layered to 5000' over the working area

A. Brief:

Briefed mission for Lake Erie 240 degree pattern.

B. Execution:

Track's graphic depiction was e-mailed to all agencies. ICAO flight plan filed. Received clearance from El Mira via phone. Departed KPEO runway 19 at 1230 via the GIBBE fix and climbed to 6000'. Reaching the point received clearance to commence the track. Flew the track at 6000', 3000', and 5000'. Once complete received clearance to KPEO for a RNAV 1 approach.

Discussion:

PI comment; "That was great just what I was looking for, thank you!"

OWLES RF20 (2014-01-28)

Ahmad Bandani, Dave Kristovich, Larry Oolman, Pamela Eck

Mission: Fly north/south legs through band coming off southern Lake Ontario

1729 Take off, Applanix OK, climb to FL070, inversion at 900 hPa, top of -20 C isothermal layer at 850 hPa.

1736 Licor turned on

1745 FL070, T=-23, DP(Licor)=-30, wind=260(true) @ 31 kt.

1751 NW on the first line near Batavia at FL070

1759 Finish west of Rochester

1808 SE bound on second line north of Rochester. T=-23, DP=-31, wind=255 @ 38 kt

1814 Finished east of Rochester

1821 NW bound on the third line between Rochester and Oswego

1829 Done. Cu on NW end are about 2000 ft below us. It has been clear above.

1835 SE bound on fourth line north of Oswego. Cu 1500 ft below. T=-23, DP=-32, wind=265 @ 38 kt.

1842 Done, descending

1844 NW bound on line 4 at FL031. T=-19, DP=-25, wind=230 @ 14 kt.

1848 200 micron ice particles under cloud. They become larger to the north

1853 Done

1903 SE bound, line 3

1910 Done

1920 NW bound on line 2 at FL030

1927 Done

1941 SE bound on line 1

1949 Done with FL030, climbing

1951 NW bound at FL050 on line 1

2001 Done

2010 SE bound on line 2
2017 Done
2019 Scrambled beams
2024 NW on line 3
2031 Done, clouds just reaching our level
2038 SE on line 4. Penetrate clouds with 0.6 gm/m³ on end leg.
2045 Done with mission, head to Penn Yan
2118 Land

OWLeS Post Mission Report

Jan 27, 2014

1. Crew: Bandani, George Young, Larry Oolman, Caitlin Crossett
2. Pre-Flight Brief: 1300
3. Planned T/O time: 1400
4. Flight Time: 4.2 Hrs
5. Weather: VMC for T/O, 3800' layered to 5500', VMC for Landing, windy.
6. Lowest cloud deck: 3600' layered to 10,000' over the working area

A. Brief:

Briefed mission for a single leg between Utica and Watertown.

B. Execution:

Track's graphic depiction was e-mailed to all agencies. ICAO flight plan filed. Delayed take due to out of limit cross wind. Cross winds within limit started motors and received clearance from El Mira via phone. Departed KPEO runway 19 at 1510 via the GIBBE fix and climbed to 5000'. Enroute to the track received clearance to climb to 8,000' and then 10,000'. Reaching the point received clearance to commence the track. Flew the leg at 10,000', 3,600', and 5,100' MSL. Repeated the leg alternating between altitudes and directions. Once complete received clearance to KPEO for a RNAV 1 approach.

Discussion:

Zephyr strikes again!

A catalog of all things atmospheric: convection, arctic cold temperatures, some icing, large water molecules (for a short burst at a time), fairly strong winds aloft, and a majestic orange and pink sunset (even though the big candle in the sky was somewhat obscured by a drooping anvil!)

OWLES RF19 (2014-01-27)

Ahmad Bandani, George Young, Larry Oolman, Caitlin Crossett

Mission: Fly north/south legs through band coming off southern Lake Ontario

2010 Take off, Applanix OK, climb to FL100, inversion at 780 hPa

2028 FL100, T=-26, DP(Licor)=-35, wind=275(true) @ 49 kt

2032 Start first leg northbound at FL100, some intermittent turbulence

2046 Done near Watertown, descending

2051 Southbound, FL036

2052 T=-18, DP=-21, wind=285 @ 28 kt

2105 T=-16, DP=-21, wind=270 @ 33 kt, mostly clear

2106 Done near Oneida, climbing, beams scrambled

2109 Northbound at FL051

2125 Done, climbing

2130 Southbound at FL100.

2137 Skimming cloud top. Tiny 200 micron ice particles.

2145 Done, descending

2150 Northbound at FL036. Clear on this end of line.

2152 Ice falling through our level

2202 Done, climbing

2209 Southbound at FL051, T=-22, DP=-27, wind=270 @ 33 kt

2224 Done, climbing

2229 Northbound FL100, T=-28, DP=-34, wind=270 @ 44 kt

2233 A few bumps again south of main band. T=-30, DP=-31, wind=280 @ 33 kt

2237 A few wisps at our level

2243 Descend

2247 Southbound FL036
2303 Climb
2306 Northbound, FL051
2315 Wind=260 @ 12 kt in center of band
2318 Wind now 290 @ 26 kt
2322 Climb
2326 Southbound at FL100.
2342 Done with mission, head to KPEO and descend to FL060
2417 Land

OWLeS Post Mission Report

Jan 26, 2014

1. Crew: Bandani, David Kristovich, Larry Oolman, James Fowler
2. Pre-Flight Brief: 0600
3. Planned T/O time: 0700
4. Flight Time: 3.4 Hrs
5. Weather: VMC for T/O, SKC, VMC for Landing, windy.
6. Lowest cloud deck: 3700' over Lake Ontario

A. Brief:

Briefed mission for a single leg between Lake Ontario and Lake Seneca.

B. Execution:

Track's graphic depiction was e-mailed to all agencies. ICAO flight plan filed. Received clearance from El Mira via phone and departed KPEO runway 19 at 0703 via the GIBBE fix and climbed to 4000'. Received clearance to commence the track. Reaching point 1 flew the leg south bound at 5,500'. Once at point 2 climbed to 10,000' and flew the leg north bound at 10,000'. Repeated the leg alternating between altitudes and direction. Once complete received clearance to KPEO for a RNAV 19 approach.

Discussion:

An inversion layer on a clear day made for a windy and cold day!

OWLES RF18 (2014-01-26)

Ahmad Bandani, Dave Kristovich, Larry Oolman, James Fowler

Mission: Fly north/south legs through band near coast

- 1154 Take off, Applanix OK, climb to FL040
- 1213 Entering band
- 1216 FL040, T=-21, DP(Licor)=-21, wind=280(True) @ 27 kt, Cloud top from WCR about 3000 ft above.
- 1217 4 m/s updraft with 0.4 gm/m³ lwc. Dbar=10 micron
- 1223 Done with leg.
- 1225 Southbound at FL055.
- 1228 North of band, T=-24, DP=-24, wind=240 @ 20
- 1231 Center of band
- 1236 About in center of WCR band, ice hardly visible but there is a good sundog.
- 1238 No echo on WCR, T=-23, DP=-26, wind=290 @ 24 – divergence across the band?
- 1250 T=-25, DP=-35, wind=270 @ 36 kt
- 1251 Done with line, scrambled beams, climbing
- 1256 Northbound FL100, T=-22, DP=-32, wind=295 @ 47 kt
- 1315 Starting to see band below us
- 1317 Beams scrambled
- 1319 Center of band, tops 2000 ft below us.
- 1321 T=-24, DP=-31, wind=285 @ 44 kt. From downward WCL, tops have gone from liquid to ice
- 1324 Done with leg, descending. From NEXRAD, western part of line appears to be pushing northward.
- 1325 Top of inversion at FL070, T=-28.
- 1328 Southbound, FL040.
- 1330 T=-20, DP=-24, wind=245 @ 31 kt
- 1331 Center of band, lwc down to 0.2 gm/m³. This part of the band is weakening on Nexrad.

1334 Out of cloud, still an echo above us.

1338 Upper echo gone, T=-20, DP=-29, wind=265 @ 25 kt.

1354 End of leg, T=-21, DP=-28, wind=275 @ 33 kt

1357 Northbound at FL055, T=-22, DP=-28, wind=280 @ 36 kt

1413 Approaching shore, band looks much weaker. T=-22, DP=-26, wind=290 @ 20 kt

1416 Seeing some ice particles

1422 Center of band, lwc up to 0.3 gm/m³

1424 Done with leg.

1427 Southbound at FL100

1450 Done with leg, descending

1454 Northbound at FL040

1458 More turbulent than before. T=-21, DP=-24, wind=270 @ 25 kt

1511 Land

OWLeS Post Mission Report

Jan 23, 2014

1. Crew: Bandani, David Kristovich, Larry Oolman, Kaitlin Rutt
 2. Pre-Flight Brief: 1600
 3. Planned T/O time: 1700
 4. Flight Time: 3.6 Hrs
 5. Weather: VMC for T/O, 3200' ceiling. Layered deck between 2200' and 7500', VMC for Landing.
 6. Lowest cloud deck: 3200', snow shower
- A. Brief:

Briefed mission for a 310 winds UW-BPL pattern.

B. Execution:

Track's graphic depiction was e-mailed to all agencies. Also, faxed a copy of the track to Buffalo approach. ICAO flight plan filed. Received clearance from El Mira via phone and departed KPEO runway 1 at 1703 via the GIBBE fix and climbed to 5000'. Enroute received clearance to 8000' and then to 10,000' and received clearance to commence the track reaching point 1. Flew the pattern at 10,000' reaching point 8 descended to 4000' flew the track in reverse back to point 1 at 4000' and once again reversed course at point 1 and flew the pattern to point 8 at 5500'. Once complete received clearance to KPEO for a RNAV 1 approach.

Discussion:

Toronto looks pretty nice and appealing at night!

OWLES RF17 (2014-01-23)

Ahmad Bandani, Dave Kristovich, Larry Oolman, Kaitlin Rutt

Mission: Upwind mission over western Lake Ontario

- 2211 Take off, Applanix OK, climb to FL080.
- 2220 Climb to FL100
- 2241 Point 1 northeast of Buffalo
- 2244 Line 1, FL100, T=-30, DP(Licor)=-30, wind=310(true) @ 19 kt
- 2246 CIP images look like 500 micron bullet rosettes
- 2311 Scrambled beams
- 2319 Done with FL100, descending to FL030
- 2324 Climb to FL040
- 2329 Reverse course to get entire leg at FL040
- 2338 Reverse course to get back on flight profile.
- 2346 Done with fourth line, head SE
- 2351 On line three @ FL040. T=-21, DP=-32, wind=300 @ 17 kt
- 2356 Done with line
- 0001 NE bound on line 2. In cloud, lwc < 0.2 gm/m³, dbar=7 micron, conc 500-1200 cm⁻³
- 0006 Done
- 0013 SW bound on line 1
- 0018 Done, climb and reverse course
- 0021 Heading NE on line 1 at FL055.
- 0024 T=-24, DP=-25, wind=290 @ 22 kt. Just above low level cloud tops. Upper cloud decks extend to 2.5 km above us.
- 0026 Penetrating clouds again. lwc=0.4 g/m³, dbar=10 micron, conc=700 cm⁻³
- 0030 LWC up to 0.7
- 0034 SW on line 2

0041 Done
0046 NE on line 3 at FL055
0051 Done, low level clouds much weaker
0056 SW on line 4. No clouds below
0102 Done with mission. Ferry back at FL060
0145 Land

OWLeS Post Mission Report

Jan 22, 2014

1. Crew: Bandani, Bart Geerts, Larry Oolman, Zhoulun Xu
 2. Pre-Flight Brief: 0800
 3. Planned T/O time: 0900
 4. Flight Time: 3.9 Hrs
 5. Weather: VMC for T/O, 2200' ceiling. Layered deck between 2200' and 3500', VMC for Landing.
 6. Lowest cloud deck: 2200'
- A. Brief:

Briefed mission for a Finger Lakes 345 pattern.

B. Execution:

Track's graphic depiction was e-mailed to all agencies. ICAO flight plan filed. Received clearance from El Mira via phone and departed KPEO runway 1 at 0903 via the GIBBE fix and climbed to 4000'. Enroute received clearance to 2500'. Reaching the fix received clearance to join the course line. Flew the pattern across Seneca and Cayuga west-east and east-west at minimum vectoring altitude along the course line (2300', 2500', 3200' and 4000'.) Following that flew north for the Seneca long fetch segment. Reaching point 13 flew the lake Ontario leg east at 2000'. Reaching point 14 reversed course and flew a saw tooth pattern 2000'block 6000'. Reaching point 13 flew the entire pattern in reverse again at 2000', 2500, 3300' and 4000' (minimum vectoring altitudes along course line.) Once complete received clearance to KPEO for a RNAV 1 approach.

Discussion:

A cold day, -20 degrees at 4000'!

OWLES RF16 (2014-01-22)

Ahmad Bandani, George Young, Larry Oolman, Michael Charnick

Mission: Downwind persistence pattern over Finger Lakes. Had trouble with the brakes freezing and needed to replace two tires after the mission.

- 1401 Take off, Applanix OK, climb to FL050.
- 1411 Descend.
- 1413 Eastbound on line 1, FL020. T=-22, DP(Licor)=-22, wind=355(true) @ 17 kt
- 1415 Climb to FL031, T=-24, DP=-25, wind=335 @ 23 kt
- 1422 Done.
- 1426 Westbound, line 2, FL031
- 1434 Done. Radar beams scrambled. Climb.
- 1437 Eastbound on line 3. FL040. T=-23, DP=-27, wind=345 @ 28 kt
- 1445 Done.
- 1448 Westbound, line 4, south of Cayuga Lake.
- 1456 Done. Penetrated some clouds at FL040. 100 micron ice on CIP.
- 1459 Eastbound,
- 1501 Scrambled beams
- 1509 Done
- 1511 Heading west towards southern end of Seneca Lake, FL040. T=-22, DP=-27, wind=350 @ 34
- 1520 Northbound over Seneca Lake @ FL040.
- 1521 Clipping cloud tops. Lots of 100-200 micron ice on the CIP
- 1529 Descend to FL025.
- 1534 Descend to FL023. T=-22, DP=-25, wind=340 @ 16 kt.
- 1541 Descend to FL020.
- 1545 Scrambled beams
- 1547 Eastbound over Lake Ontario

1556 Done, reverse course, climb to FL060. Cloud tops around 3000 ft.

1602 Descend to FL020

1608 Southbound at FL020. T=-21, DP=-23, wind=345 @ 9 kt

1612 Climb to FL023. T=-21, DP=-26, wind=350 @ 8 kt.

1616 Climb to FL025.

1618 Over Lake Seneca

1619 Climb to FL040

1626 Descend to FL037

1627 In cloud, lwc to 0.3 gm/m³, dbar=7 micron

1629 At south end of Lake Seneca, turn to east.

1632 Climb to FL040

1634 Scrambled beams

1640 Westbound 10 miles south of Cayuga Lake at FL040. Near cloud top. Thin layer of liquid water on tops of Cu. T=-23, DP=-26, wind=345 @ 26 kt

1645 Lt-Mod turbulence

1649 Done with line over Elmira.

1654 Eastbound, south of Lake Seneca.

1659 Scrambled beams

1702 Done over Ithaca

1706 Westbound across lakes.

1715 Done, south of Dundee

1719 Eastbound near Penn Yan

1724 Scrambled beams

1726 Done

1729 Westbound still at FL040. T=-22, DP=-26, wind=335 @ 23 kt

1737 Done with mission

1751 Land

OWLeS Post Mission Report

Jan 20, 2014

1. Crew: Bandani, George Young, Larry Oolman, Michael Charnick
 2. Pre-Flight Brief: 1230
 3. Planned T/O time: 1330
 4. Flight Time: 4.1 Hrs
 5. Weather: VMC for T/O, 3000' ceiling solid layer to 7000', VMC for Landing.
 6. Lowest cloud deck: 3000' snow showers
- A. Brief:

Briefed mission for a Downwind Persistence 360 pattern.

B. Execution:

Track's graphic depiction was e-mailed to all agencies. ICAO flight plan filed. While waiting for clearance from El Mira via phone due to snow drift the plane's brakes froze. Once the issue was resolved departed KPEO runway 1 at 1335 via the GIBBE fix and climbed to 5000'. Enroute received clearance to 10,000'. Reaching the fix received clearance to join the course line. Flew the leg west-east and east-west at 10,000', 5000' and 3600' while alternating direction and altitude. Once complete received clearance to KPEO for a RNAV 1 approach.

Discussion:

Prior to brief plan was changed to a single east-west leg at 10,000', 5000' and 3600'. Updated all agencies with the change prior to brief and re-filed ICAO flight plan.

Following the refueling the breaks were frozen and after using a heating gun and a blanket managed to tow the plane back into the hangar where noticed the bald tires.

OWLES RF13 (2014-01-20)

Ahmad Bandani, George Young, Larry Oolman, Michael Charnick

Mission: Downwind persistence pattern over Finger Lakes. Had trouble with the brakes freezing and needed to replace two tires after the mission.

1839 Take off, Applanix OK, climb to FL100.

1844 Cloud top at FL078. LWC to 0.4 gm/m³, DBAR up to 20 micron.

1857 Done with line near Dansville

1902 FL100, T=-15, DP(Licor)=-18, wind=280(true) @ 54 kt. ACu extending about 2000 ft above us. St about 1500 ft below. WCR echoes extend through the layer between.

1904 WCR looks more convective over Keuka Lake

1907 Convective boundary layer over Seneca Lake extends about 2000 ft above surface.

1909 Done with FL100 leg between Seneca and Cayuga Lake, descend.

1912 Westbound at FL050. T=-11, DP=-12, wind= 275 @ 35 kt.

1915 Numerous columns on CIP.

1920 A little turbulence off Keuka Lake. Extends to our altitude.

1931 Done, descend to FL036.

1933 Eastbound. T=-13, DP=-14, wind=310 @ 18 kt

1946 Done with line, climb to FL100.

1952 Westbound, FL100. Clear above. Near top of St layer. From WCL, liquid layer 1500 ft below.

2008 Lower cloud top now 5000 ft below us. ACu above increasing.

2011 Done, descending.

2015 Eastbound, FL050. T=-13, DP=15, wind=270 @ 32 kt.

2022 Through convective turbulence downwind of Keuka Lake.

2027 Done, descend.

2028 Westbound, FL036

2034 T=-13, DP=-15, wind=310 @ 16 kt.

2036 Mostly clear upwind of Keuka Lake.

2044 Done. Climb.

2041 Eastbound FL100. T=-17, DP=-18, wind=270 @ 50 kt. Thin liquid layer 400 ft above us. Top of St layer 3000 ft below.

2101 Done, descend.

2104 Westbound, FL050. T=-13, DP=-16, wind=280 @ 32 kt.

2122 Done, descend.

2126 Eastbound, FL036. T=-15, DP=-15, wind=200 @ 22 kt.

2138 Done, climb

2146 Westbound, FL100. T=-18, DP=-17, wind=270 @ 54 kt.

2149 In general today, it seems that from the WCR there is a precipitation minimum over the lakes.

2158 Skimming cloud top.

2200 KT is within one degree of TRF.

2205 Done, descend

2210 FL036, T=-15, DP=-16, wind=300 @ 17 kt.

2223 Done with mission, climb to FL041

2237 Land

OWLeS Post Mission Report

Jan 19, 2014

1. Crew: Bandani, Phil Bergmaier, Larry Oolman, Andrew Janiszkeski
 2. Pre-Flight Brief: 1600
 3. Planned T/O time: 1700
 4. Flight Time: 3.2 Hrs
 5. Weather: VMC for T/O, 3000' ceiling solid layer to 9000', VMC for Landing.
 6. Lowest cloud deck: 3000'
- A. Brief:

Briefed mission for a Tug Hill and beyond pattern.

B. Execution:

Track's graphic depiction was e-mailed to all agencies. ICAO flight plan filed. Late out of chocks due to fuel storage tank switching process. Once the storage fuel tank was finally switched; refueled and instruments on line started and received clearance via phone from El Mira and departed KPEO at 1730 via the GIBBE fix and climbed to 9000'. Due to icing enroute received clearance to 10,000'. Reaching the fix received clearance to join the course line. Flew the first three points at 10,000', descended to 7000' flew the leg at 7000' and once again 5000' block 6000'. It became apparent the large water molecules, mix icing, frozen over "P" instruments along with pilot side windshield and prop de-icing being overwhelmed the conditions we were in would not permit for a flight in the lower altitudes. With PI's concurrence climbed back to 10,000' flew the rest of the remaining points at 10,000'. Once at point 4 reversed course descended to 8000' and flew points 4,5,4,5 and point 7 at 8000'. Once complete received clearance to KPEO for a RNAV 19 approach.

Discussion:

Night Inversion layer due to an Alberta Clipper and "warm(er)" weather aloft and 55-70 knot winds.

They had forgotten to switch tanks so refueling took a while!

Windshield heat and prop heat were overwhelmed due to icing conditions in cloud.

The folks on the ground were appreciative our efforts.

OWLES RF13 (2014-01-19)

Ahmad Bandani, Phil Bergmaier, Larry Oolman, Andrew Janiszewski

Mission: Eastern Lake Ontario and Tug Hill.

- 2241 Take off, Applanix OK, climb to FL090.
- 2300 LWC-100 gone
- 2308 Liquid water around 0.5 gm/m³, climb to FL100 to get out of icing. LWC-100 back.
- 2308 Cloud top around FL095.
- 2311 Pt 2, turn northbound @ FL100. In and out of cloud top. T=-16, DP(Licor)=-17, wind=270 (true) @ 65 kt.
- 2320 Cloud tops from lidar are around 8500 ft. From WCR, ice cloud tops appear to be about 7000 ft.
- 2321 Pt 3 over Lake Ontario west of Watertown, descend to FL060. Cloud top at FL084 but not well defined. Repeat leg.
- 2329 2D-P gone
- 2332 Done with leg. Climb to FL100
- 2335 CDP iced. Eastbound @ FL100, above clouds. T=-13, DP=-34, wind=270 @ 70 kt.
- 2339 Downward lidar slowly recovering from probably ice on outside.
- 2348 Beams scrambled
- 2355 Done with line, reverse course.
- 0009 FL100, T=-13, DP=-37, wind=275@63 kt
- 0015 Scrambled beams
- 0021 CDP back
- 0025 2D-P back
- 0038 Finally done with westbound line
- 0041 Eastbound at FL100
- 0044 T=-9, DP=-35, wind=290 @ 63 kt
- 0051 At pt 5, descend to FL080.
- 0053 Westbound, at cloud top. LWC=0.2 gm/m³, dbar=20 micron

0055 T=-17, DP=-18, wind 270@44 kt
0100 Scrambled beams
0110 T=-13, DP=-25, wind=270@48 kt, WCR echoes over lake are weak.
0116 No WCR echo below us. Thin clouds on WCL 1 km below us.
0123 Done with mission. T=-9, DP=-38, wind=270@44 kt
0128 Beams scrambled
0138 Cloud top FL074 on descent into PEO.
0139 LWC = 0.7 gm/m3
0148 Land

OWLeS Post Mission Report

Jan 18, 2014

1. Crew: Bandani, David Kristovich, Larry Oolman, Jake Patrick Mulholland
 2. Pre-Flight Brief: 1100
 3. Planned T/O time: 1200
 4. Flight Time: 4.0 Hrs
 5. Weather: VMC for T/O, Layered deck between 3600'- 7500', VMC for Landing.
 6. Lowest cloud deck: 3600' light snow
- A. Brief:

Briefed mission for a 330 winds-FL over south western Lake Ontario and Finger Lakes.

B. Execution:

Track's graphic depiction was e-mailed to all agencies. ICAO flight plan filed. Once the snow plow was done started and received clearance via phone from El Mira and departed KPEO at 1220 via the GIBBE fix and climbed to 8000'. Enroute received clearance to 10,000'. Reaching the fix received clearance to join the course line. Flew the entire pattern from point 1 to point 8 at 10,000'. Enroute from point 1 to point 2 had to reverse course back to point 1 as the radar had stopped working. Reaching point 1 reversed course and started the pattern once again. Reaching point 8 descended to 4000' and flew the pattern from point 8 to points 5, 4, 3,6,5,4 and 3. Once at point 3 Climbed to 10,000 and flew the bottom (southern) three boxes. Once complete descended to 4000' and received clearance to KPEO for a RNAV 19 approach.

Discussion:

PI was satisfied with his flight.

Ran one of the two fuel storage tanks on the field dry today, a first!

OWLES RF13 (2014-01-18)

Ahmad Bandani, Dave Kristovich, Larry Oolman, Jake Mulholland

Mission: Investigate Finger Lakes enhancement. Radar server crashed at 1751. No other known issues.

- 1729 Take off, Applanix OK, climb to FL100.
- 1741 Radar echoes 1 km above and all the way to the ground.
- 1751 WCR crashed
- 1754 WCR back up and running, circle back to pt 1.
- 1804 Second try at the first line, north of Rochester, heading ENE. FL100. T=-19, DP(Licor)=-19, wind=120 @ 5 kt.
- 1608 Strongest WCR echos around 6000 ft msl
- 1614 East end of line. Passed over a Nexrad band. Winds shifted to 220 @ 6 kt. T=-18.
- 1825 Start second line at FL100 from west of Syracuse to the WSW.
- 1830 T=-19, DP=-20, wind=230 @ 9 kt. Cloud above us is thinning rapidly.
- 1834 Done with second line
- 1842 Start third line SE of PEO heading ENE.
- 1845 Slight decrease in WCR reflectivity along the east shore of Cayuga Lake
- 1849 T=-19, DP=-19, wind=240 @ 8 kt.
- 1850 Done with line 3.
- 1859 Start fourth line at FL100, east of Ithaca heading WSW. Just below cloud top.
- 1905 FL100, T=-19, DP=-20, wind=220 @ 16 kt.
- 1908 Done with fourth line, descend to FL040, head north to pt 3.
- 1929 On second line, heading ENE at FL040.
- 1931 T=-11, DP=-12, wind=310 @ 20 kt
- 1939 Done with line 2.
- 1946 WSW on line 3
- 1949 T=-10, DP=-12, wind=315 @ 25 kt

1951 Still reflectivity gap along east shore of Cayuga Lake

1956 Done with line 3, climb to FL100

1959 Sometimes there is a missing bit in one of the 2D-P buffers.

2004 Heading ENE on line 2 @ FL100. T=-19, DP=-24, wind=250 @ 7 kt. Clear above, thin ice cloud maybe 2000 ft below. Top of liquid layer 5000 ft below. No apparent precipitation reaching ground seen on the WCR.

2009 Can see ground through the cloud.

2013 Done with line 2.

2015 Back WSW on line 2.

2027 Done, solid cloud deck 1000 ft below us.

2034 ENE on line 4 @ FL100.

2035 Through tops of thin clouds.

2043 Done with line 4.

2049 WSW on line 5 @ FL100.

2051 Near stronger nexrad echoes, cloud extend to our level.

2059 Done with mission. Clouds 2000 ft below.

2120 Land

OWLeS Post Mission Report

Jan 15, 2014

1. Crew: Bandani, David Kristovich, Larry Oolman, Chad Hecht
 2. Pre-Flight Brief: 1700
 3. Planned T/O time: 1800
 4. Flight Time: 2.8 Hrs
 5. Weather: VMC for T/O, Layered deck between 2300'- 8000', VMC for Landing.
 6. Lowest cloud deck: 2300'
- A. Brief:

Briefed mission for a 220 winds-PBL over south western Lake Ontario.

B. Execution:

Track's graphic depiction was e-mailed to all agencies. Also, as per prior request from Buffalo approach faxed a copy to them. ICAO flight plan filed. Slow out of the chocks. Received clearance via phone from El Mira and departed KPEO at 1915 via the GIBBE fix and climbed to 8000'. Enroute received clearance to 10,000'. Reaching the fix received clearance to join the course line. Flew the first west-east research leg at 10'000' reversed course and flew the same leg at 2300' and then once again reversed course and flew the leg at 3800'. Once complete climbed to 10,000' and proceeded to the second research leg. Flew the leg east-west at 10,000' reversed course and flew the same leg west-east at 2300' and then once again reversed course and flew the same leg east-west at 3800'. Once complete climbed to 8000' and received clearance to KPEO for a RNAV 19 approach.

Discussion:

Satisfied customer.

Large size precip in cloud but nothing like last time I flew with Dave, I recall the pilot side windshield being covered and it was a dark windy night in Laramie!

Little slow out of the chocks setting up the instruments but we got out.

Faxing the track graphic seemed to make Buffalo happy and they were very helpful.

OWLES RF12 (2014-01-16[after 00Z])

Ahmad Bandani, Dave Kristovich, Larry Oolman, Chad Hecht

- 0017 Take off, Applanix OK
- 0026 Reference flow on Licor turned on.
- 0036 CIP probe started
- 0041 Started recording WCR
- 0056 Start first line near shore east of Rochester @ FL100.
- 0058 T=-18, DP(Licor)=-28, winds=230(true)@26 kt
- 0104 Done northeast of Rochester, descend to FL023
- 0110 Westbound on first line
- 0114 T=-6, DP=-11, wind=250@25 kt
- 0116 Flying through 1 cm aggregates
- 0123 Done, climb to FL038
- 0126 Eastbound on first line
- 0128 T=-10, DP=-13, wind=250@24 kt, occasionally clipping small Cu. About in the center of the radar echo. Can clearly see the lights on shore
- 0134 Done, climb to FL100.
- 0137 Top of lower cloud deck at FL062.
- 0143 Westbound on second line @ FL100
- 0146 T=-18, DP=-27, wind=230@22 kt
- 0153 Done, descend to FL023, cloud top at FL070
- 0159 Eastbound on line 2 @ FL023
- 0201 T=-7, DP=-11, wind=275 @ 20 kt
- 0210 Done
- 0212 Westbound on line 2 @ FL038
- 0214 Passing through small graupel or snow grains.

0216 T=-10, DP=-11, wind=270 @ 20 kt, LWC up to 0.5 gm/m³

0224 Done with mission, climb to FL080

0239 Bi-modal droplet spectra with peaks at 7 and 25 micron

0257 Land

OWLeS Post Mission Report

Jan 12, 2014

1. Crew: Bandani, Bart Geerts, Larry Oolman, Dan Welsh
 2. Pre-Flight Brief: 0530
 3. Planned T/O time: 0700
 4. Flight Time: 3.4 Hrs
 5. Weather: VMC for T/O, Layered deck between 2000'- 10,000', VMC for Landing.
 6. Lowest cloud deck: 2000'
- A. Brief:

Briefed mission for the Long Fetch 275 pattern over Tug Hill.

B. Execution:

Track's graphic depiction was e-mailed to all agencies. ICAO flight plan filed. Received clearance via phone from El Mira and departed KPEO at 0710 via the GIBBE fix and climbed to 6000'. Reaching the fix received clearance to join the course line direct to the first southerly point on the track. Enroute received clearance to descend to 2000' and descended to 2000'. Crossing shore line descended to 1000' in VFR condition and started the flux leg. Reaching point 2 climbed to 10,000' for sounding and then descended to 7000' and commenced the track at 7000' starting at point 3 to point 11. Reaching point 11 flew the long wind leg at 6000', reversed course and flew the same leg at 5000'. Once crossed the third north-south research leg (~40nm) again reversed course and flew the track at 4000'. Reaching point 12 continued at 4000' to point 1. Reaching point 1 received clearance to KPEO and flew the RNAV 19 approach.

Discussion:

Crossing the lake at 1000' in VFR works so long as there is a willingness to sacrifice time and fuel to re-coordinate the IFR flight plan with the ATC.

Today was the clear ice and crosswind day. All for a good cause as the PI was happy with the flight.

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OWLES RF11 (2014-01-12)

Ahmad Bandani, Bart Geerts, Larry Oolman, Dan Welsh

Mission: Investigate the effect of the lake on orographic uplift

- 1216 Take off, Applanix OK. Climb to FL060
- 1225 Lost LWC-100
- 1231 Turned WCR fans on
- 1232 LWC-100 back
- 1235 Descend to FL010 for a flux leg over Lake Ontario
- 1250 At pt 2, climb to FL100 for sounding.
- 1256 Two cloud layers. Top of upper layer at 8800 ft. Very narrow droplet spectra up to 15 microns.
- 1259 Descend to FL070.
- 1301 Base of upper deck around 7700 ft.
- 1304 Southbound leg 2 at FL070. T=-11, DP(Licor)=-13, Winds=300(True) @ 30 kt.
- 1310 Done. Clouds thicker on southern end.
- 1314 Northbound on leg 3.
- 1317 Scrambled beams
- 1320 Done
- 1324 Southbound on leg 4.
- 1329 Done
- 1334 Northbound on leg 5
- 1339 Done
- 1341 Scrambled beams
- 1352 Descend to FL060 and head west. Clouds clear in lee of mountain.
- 1356 Westbound
- 1404 LWC-100 gone

1407 Scrambled beams
1410 LWC-100 back
1434 Done with leg, descend to FL050, cloud top 5100 ft
1435 Scrambled beams
1437 Eastbound, lwc up to 0.8 gm/m³, dbar about 20 microns
1440 LWC-100 gone
1445 Done, descend to FL040
1446 LWC-100 back but values lower than PVM
1448 Westbound, lwc up to 0.4 gm/m³, dbar=15 micron, T=-5, DP=-6, wind=270@34 kt
1504 2D-P gone
1517 Done with mission, heading home.
1532 Land

OWLeS Post Mission Report

Jan 09, 2014

1. Crew: Bandani, Bart Geerts, Larry Oolman, Phillip Bergmaier
 2. Pre-Flight Brief: 0530
 3. Planned T/O time: 0700
 4. Flight Time: 3.3 Hrs
 5. Weather: VMC for T/O, Layered deck between 2000'- 4000', VMC for Landing.
 6. Lowest cloud deck: 2000' with light snow
- A. Brief:

Briefed mission for the Long Fetch 275 pattern.

B. Execution:

Track's graphic depiction was e-mailed to all agencies. ICAO flight plan filed. No one home answering the phones at El Mira. Finally after two attempts got a live voice and after a few minutes it became apparent that there was no sign of any flight plan. With the printed copy of the filed flight plan in hand phoned flight service re-filed via phone in the airplane; received clearance and finally departed KPEO at 0745 via the GIBBE fix and climbed to 5000'. Reaching the fix received clearance to join the course line direct to the first southerly point on the track. Enroute received clearance to climb to 6000' and stayed at 6000'. Commenced the track at 6000' and reaching the north point received clearance and descended to 1000' for the sounding. Sounding complete; climbed back to 4500' and flew the majority of the pattern west to east at 4500' (~midway through the track descended to 3200' with numerous extension and shortening of each leg.) Once at the east end of our track; flew the track in reverse at 3000' east to west with two repetition of the leg before the last most easterly leg at the request of the PI. Once complete on the track received clearance back to KPEO and flew the RNAV 19 approach.

Discussion:

Trying to figure out why DUATS flight plan was not in the system as I had a hard copy in hand, but I believe lack of sunshine and cold temperatures might have had something to do with it!

Even though late getting off the ground PI was happy and very satisfied with the work.

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OWLES RF10 (2014-01-09)

Ahmad Bandani, Bart Geerts, Larry Oolman, Phil Bergmaier

Mission: Fly a series of legs at different altitudes along the upwind half of Lake Ontario

- 1252 Take off, Applanix OK, climb to FL060
- 1306 T=-12, DP(Licor)=-33, Winds=300(True)@22 kt
- 1320 Pt 1 at FL060
- 1325 Pt2. T=-12, DP=-32, Wind=310@20 kt, descend to 1000 ft
- 1327 Cloud top 4600 ft
- 1331 Climb to FL045
- 1334 Line 2 @ FL045, LWC up to 1 gm/m³
- 1340 Done
- 1343 Line 3
- 1345 T=-15, DP=-17, Winds=310@12 kt, LWC up to 0.8 gm/m³, DBAR under 10 micron.
- 1348 Scrambled beams
- 1349 Done with line 3
- 1352 Line 4
- 1359 Done, extended by 2 miles
- 1402 Northbound on line 5
- 1411 Southbound on line 6, weak return signal on nadir lidar. No visible ice on window.
- 1414 Scrambled radar
- 1417 Done
- 1420 Northbound line 7, 2D-P blocked.
- 1421 CDP blocked
- 1424 CDP back
- 1426 Done with line 6.

1428 Spike on LWC-100, baseline shifted. Broken slave coil?

1430 Southbound on line 8

1441 Northbound on line 7 at FL030

1442 Scrambled beams

1446 Done with 7

1449 South again on 7, time close to Oswego radiosonde launch. LWC-100 baseline back down, perhaps it was only ice.

1455 Done

1457 2D-P is back

1458 Nadir lidar looks better. Perhaps the window was powder coated with small supercooled drops.

1502 Done

1505 Southbound on line 6. Climb to FL034.

1509 Beams scrambled

1512 Done with 6.

1514 Northbound on line 5.

1521 Done

1523 Southbound on line 4. LWC up to 0.7 gm/m³

1529 Done

1533 Northbound on line 3.

1535 Scrambled beams.

1538 Done with line 3.

1543 CDP conc over 2500 cm⁻³, LWC = 1.5 gm/m³, DBAR=10 micron

1547 Finished with research, head home. Climb to FL040.

1607 Land

OWLeS Post Mission Report

Jan 08, 2014

1. Crew: Bandani, George Spencer Young, Larry Oolman, Dan Welsh.
 2. Pre-Flight Brief: 0945
 3. Planned T/O time: 1100
 4. Flight Time: 4.0 Hrs
 5. Weather: VMC for T/O, Layered deck between 3200'- 6000', VMC for Landing.
 6. Lowest cloud deck: 3200'.
- A. Brief:

Briefed mission for the second OWLeS Multi Lake EO ladder pattern.

B. Execution:

Track's graphic depiction was e-mailed to all agencies. ICAO flight plan filed. Following a phone clearance from KELM tower departed KPEO at 1120 local via the GIBBE fix and climbed to 5000'. Reaching the fix received clearance to join the course line direct to the first southerly point on the track. Enroute received clearance to climb to 8000' and stayed at 8000'. Prior to starting the track climbed to 10,000' and started the first leg north bound at 10,000. Repeated the leg south bound at 3200' and repeated the leg again at 4000'. Crossed over to the second research leg and flew it at 3200' south bound then repeated the leg at 4000' and repeated the leg north bound at 10'000. Flew the remaining two legs each at 3200' and 10'000. Once complete received clearance and flew the RNAV 19 back to KPEO.

Discussion:

Good science day.

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OWLES RF09 (2014-01-08)

Ahmad Bandani, George Young, Larry Oolman, Dan Welsh

Mission: Fly a series of legs at different altitudes along the upwind half of Lake Ontario

1622 Take off, Applanix OK, climb to FL080

1638 Climb to FL100

1641 T=-19, DP(Licor)=-24, Winds 270(True)@30 kt. Broken cloud deck below us with tops to 5000 ft.

Clear above.

1653 Point 1, heading north on line 1.

1702 Over Nexrad line. WCR echoes to ground. WCL cloud tops glaciated, were liquid before this.

1705 End of line 1, descend to FL027. Canadian shore is clear.

1709 Southbound on line 1 at FL027.

1712 T=-15, DP=-17, Winds 250@24 kt

1724 Done with line 1, climb to FL040

1725 Northbound on line 1.

1736 CDP droplet concentrations up to 2200 cm⁻³.

1740 Done.

1745 Descend to FL032

1751 Southbound line 2

1800 South shore, T=-16, DP=-18, Wind=260@25 kt

1804 Done, climb to FL040

1807 Northbound, line 2.

1816 T=-17, DP=-18, Wind=250@32 kt

1819 Done, climb to FL100, cloud top at FL048

1825 Southbound line 2

1836 Done

1846 Northbound line 3, FL100.
1858 Done with line 3, descend to FL010, Cloud top around 4000 ft.
1903 Southbound, line 3
1904 Climb to FL032
1907 Scrambled beams
1915 Done, fly east to line 4.
1923 Northbound at FL032
1926 T=-15, DP=-17, Winds=250@20 kt
1936 Done, climb to FL100
1941 Last leg on line 4.
1946 T=-19, DP=-26, Wind=270@37 kt
1957 Cloud top around 5000 ft.
2009 Land

OWLeS Post Mission Report

Jan 07, 2014

1. Crew: Bandani, Phillip Bergmaier, Larry Oolman, Dan Welsh.
 2. Pre-Flight Brief: 1230
 3. Planned T/O time: 1430
 4. Flight Time: 3.7 Hrs
 5. Weather: VMC for T/O, Layered deck between 3600'- 10,000', VMC for Landing.
 6. Lowest cloud deck: 2600'.
- A. Brief:

Briefed mission for the second OWLeS Ontario Long Fetch 265 ladder.

B. Execution:

Track's graphic depiction was e-mailed to all agencies. ICAO flight plan filed. Following a phone clearance from KELM tower departed KPEO at 1420 local via the GIBBE fix and climbed to 4000'. Reaching the fix received clearance to join the course line direct to the first southerly point on the long fetch 265 track. Enroute received clearance to climb to 8000' and then to 10,000'. Reaching the point commenced the track at 8000. Flew the first six research legs at 8000. Extended the third and fourth leg between 5 to 10 miles from their respective initial planned coordinates. Repeated the legs at 6000' and then at 4000'. Once complete with fourth leg proceeded direct to the eastern most point on the long fetch track and commenced the leg west bound. Crossing the shore line commenced the saw tooth profile between 3600' and 9000'. Once complete received clearance and flew the RNAV 19 back to KPEO.

Discussion:

Wheeler Sac Army controllers were tremendous!

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OWLES RF08 (2014-01-07b)

Ahmad Bandani, Phil Bergmaier, Larry Oolman, Dan Welsh

Mission: Second of two flights over eastern Lake Ontario and the coast. AIAS and DPR measurements hosed. Phil suggests that they may have been that way at the end of the previous flight. Will need to process with BIAS. 2D strobe rate is also incorrect. There was also a series of accelerometer and gyro errors from the Applanix from 2035 until 2101 UTC.

1921 Take off, Applanix OK.
1950 Point 1 at FL080
1956 Done with line 1.
2007 Done with line 2
2009 Start line 3
2019 Done with line 3
2023 Line 4
2031 Done
2035 Line 5
2039 Thin layer above main cloud.
2045 Reset Applanix
2047 Done with line 5
2050 Another Applanix fault
2053 Another Applanix fault, 'Accelerometer bias error'
2059 Applanix 'Gyro Bias Error'
2101 Done with line 6. Descend to FL060
2102 Reset Applanix
2119 Done with line 5
2123 Line 4
2133 Done, descend to FL040
2138 Back to north on line 4.

2144 Done, head to eastern end of along wind leg. Climb to FL090

2151 AIAS values look good again.

2201 Heading west, starting at FL090.

2209 AIAS is reading low.

2217 Over water, start descent to 3600 ft.

2222 AIAS is reading zero.

2224 Heading back up. AIAS instantly working.

2233 Finished, heading home.

2259 Land

OWLES RF07 (2014-01-07a)

Brett Wadsworth, Bart Geerts, Larry Oolman, Phil Bergmaier

Mission: First of two flights over eastern Lake Ontario and the coast.

Pre-mission: ATC lost flight plan, had to return to refuel. Returned to hangar second time over concerns about the autofeather.

Instrument issues: The AIAS values are bad after 1628. This affects the 2D images.

- 1312 Take off, Applanix failed
- 1315 Visible frost on the downward lidar window. Turned up the flow on both to 20 psi.
- 1327 Turned on Licor flow meter
- 1331 At FL100, because of the cold temperatures this is actually only 8800 ft.
- 1332 T=-32, DP(Licor)=-36, winds 280@21 knots.
- 1337 Point 1 at FL100
- 1344 Turn to east
- 1347 Southbound at FL090
- 1349 Through cloud top, LWC up to 0.4 gm/m³.
- 1354 Done with 2nd leg.
- 1358 Northbound. T=-32, DP=-36, Winds 250@24
- 1402 Through cloud top. LWC up to 0.2 gm/m³. CIP ice particles around 200 um
- 1403 Done with 3rd leg.
- 1407 Southbound just off shore
- 1411 Scrambled beams
- 1414 Done with 4th leg.
- 1418 Northbound over shore. Significantly more turbulent.
- 1424 Done with 5th leg.
- 1428 Southbound

1435 Done with 6 leg. Head west descending to FL070

1440 Northbound on leg 5.

1447 Turn to west.

1453 Southbound on leg 4.

1459 Descend to FL040

1502 Northbound on leg 4.

1506 CDP lwc peaks at 1 gm/m³

1509 Done, climb to FL065

1512 Southbound on leg 4.

1519 Done, turn east.

1523 Northbound on leg 5 over land at FL065. T=-29, DP=-29, Winds=270@45 kt.

1529 Turn east.

1533 Southbound on leg 6 at FL065.

1540 Turn to east.

1546 Along wind westbound leg at FL065.

1557 Getting intermittent sealevel read errors on CIP

1607 Lost upward lidar, low water level warning. Not restarted.

1621 Descend to FL060 and head home.

1628 AIAS values and 2D images are bad.

1645 Land

OWLeS Post Mission Report

Jan 06, 2014

1. Crew: Bandani, George Spencer Young, Larry Oolman, Dan Welsh.
 2. Pre-Flight Brief: 1030
 3. Planned T/O time: 1300
 4. Flight Time: 3.3 Hrs
 5. Weather: VMC for T/O, Layered deck between 2600'- 10,000', VMC for Landing.
 6. Lowest cloud deck: 2600'.
- A. Brief:

Briefed mission for the OWLeS Downwind Persistence (DP) 260 ladder.

B. Execution:

Track's graphic depiction was e-mailed to all agencies. ICAO flight plan filed. Take off was delayed by thirty minutes due to unfavorable direct crosswind at KPEO. Winds in limit and following a phone clearance from KELM tower departed KPEO at 1330 local via the GIBBE fix and climbed to 8000'. Reaching the fix received clearance to join the course line direct to the first northerly point on the DP 260 track. Enroute received clearance to climb to 10,000'. Reaching the point commenced the first leg of the track at 10'000, repeated the same leg at 6000' and then again at 4000'. Skipped the middle track and flew the third leg and repeating the leg at 4000', 6000', and 10,000'. Following that proceeded to the last leg and flew the leg at 10,000', 6000', and 4000'. Mission complete received clearance and flew the RNAV 19 back to KPEO.

Discussion:

Hats off to Zephyr!

Happy PI and a satisfied customer.

-

OWLES RF06 (2014-01-06)

Ahmad Bandani, George Young, Larry Oolman, Dan Welsh

- 1826 Take off, Applanix OK
- 1854 Upward lidar looks odd. Perhaps frosted? Turned up flow to 15 psi.
- 1857 NW corner of transect. At FL100 ft, T=-22 C, DP=-24C, Winds 260@37 knots, starting to find clouds.
- 1900 Head south at FL100 ft.
- 1916 Turn north, descending to FL060 ft.
- 1923 T=-17, DP=-19, Winds 255 @ 42 knots.
- 1925 Turned down upward lidar flow to 10 psi.
- 1930 Reverse to south, descend to FL040 ft.
- 1934 T=-16, DP=-17, Winds 245@46 knots. Midlevel in small boundary layer Cu. StCu layer above.
- 1941 Beams scrambled.
- 1946 Turn east.
- 1955 North at FL040 ft.
- 2004 FL040 ft, T=-15, DP=-16, Winds=250@51 knots
- 2007 Climb to FL060 ft and head south
- 2016 Increase upward lidar flow from 10 to 12.5 psi.
- 2023 Reverse to north, climbing to FL100 ft.
- 2035 T=-22, DP=-31, Winds=230@34 knots
- 2052 Southbound, east of Rochester at FL100 ft.
- 2057 T=-22, DP(Licor) = -25, Winds 245@37 knots
- 2103 Reverse northbound, descend to FL060 ft. In and out of cloud tops
- 2109 T=-17, DP=-20, Winds 265@34 knots
- 2120 Southbound at FL040 ft.
- 2141 Land

OWLES 2013 RF-5 Post Mission Report

December 15, 2013

1. Crew: Wadsworth, Geerts, French, Bergmeier.
 2. Pre-Flight Brief: 1530
 3. Planned T/O time: 1730
 4. Flight Time: 3.6 Hrs
 5. Weather: IMC for T/O, snowing, ~2000' overcast, 2 miles visibility. Solid overcast throughout op area; cloud tops at 11000'. Clear above.
 6. Lowest cloud deck: <1600' MSL on approach.
- A. Plan:

Planned to execute a "long-axis" lawnmower pattern on about a 270 alignment similar to the image shown at bottom of this. Filed for a departure off Rwy 01, to BEEPS, then the lat/longs of the desired points with an initial alt of 10000'.

Preflight prep took another leap into the difficult category. Ramp was loose snow over packed snow. 1 – 4 inches depending on drift amount. Just outside of the hangar doors was the worst location as this was immediately downwind of the hangar, so blowing/drifting snow was continually swirling here and collecting in the tracks for the hangar door. Opening the door was incredibly difficult, requiring us to shovel/sweep the door tracks; get every person (4 – 6) pushing on the doors in order to open/close. On the ramp, the electric tugs have a tough time, but no worse than our own tug back in Laramie would. Biggest complication is that the entrance to the hangar is a slight uphill slope. Tug with a full aircraft, on snow, going uphill is difficult at best. Over an hour to complete the fueling of N2UW.

B. Execution:

Started the engines, and immediately had to shut down as one of the instruments wasn't working due to snow accumulating on the laser transmitting glass.

When we were ready for taxi, the left main brake was frozen. Pushing the aircraft out to position for startup had put the main through a small drift. Turned the aircraft a bit so it wasn't pointing at the fuel tanks, then drug it a bit towards an area that had less packed snow. Eventually broke it free.

I called El Mira Tower for my clearance. Rochester had an aircraft going into Canadaigua, so they gave me the clearance, with a hold-for-release. Had to call back twice (total delay of ~20 minutes) before released.

Probably had over an inch of snow accumulated on the wings outboard of propwash by the time we were released. I tasked Jeff & Phil to watch the wings on takeoff to verify that the

snow blew off. If it hadn't come off by 60 knots I was planning to abort. Fortunately it came off.

The pattern was started over Pt 1 (reference the graphic below) at 10000' MSL. We were taking on some ice, (still relatively a low rate of accumulation, but constant unlike in previous flights). After the ice started impacting science gear, and I commented that our fuel consumption was going to be higher, the PI decided to climb to 11000' which was just above the clouds for the entire first ladder. Later we descended down to 6000' for flying the points: 9-10-7-8-7-8-9-10, then the along-wind leg from 13-14.

There was less accumulating ice at the lower altitude than there had been at cloud tops. There were pockets of fairly heavy precip, but it was hard enough that it normally helped to wear some ice off the wings. Total accumulation on the wing leading edges was <1/2 inch for the flight.

XM weather was showing that the snow which was over KPEO for departure had moved to the north just a bit. METAR indicated that it was VFR. Winds had increased at the field while we were airborne, going from variable at 3 knots, to out of the west at a solid 14 knots.

Took the RNAV to Rwy 19. We were in the band (heavy snow), north of the field from the IAF to about 3 miles from the runway, when we broke out. Crosswinds made for an interesting landing.

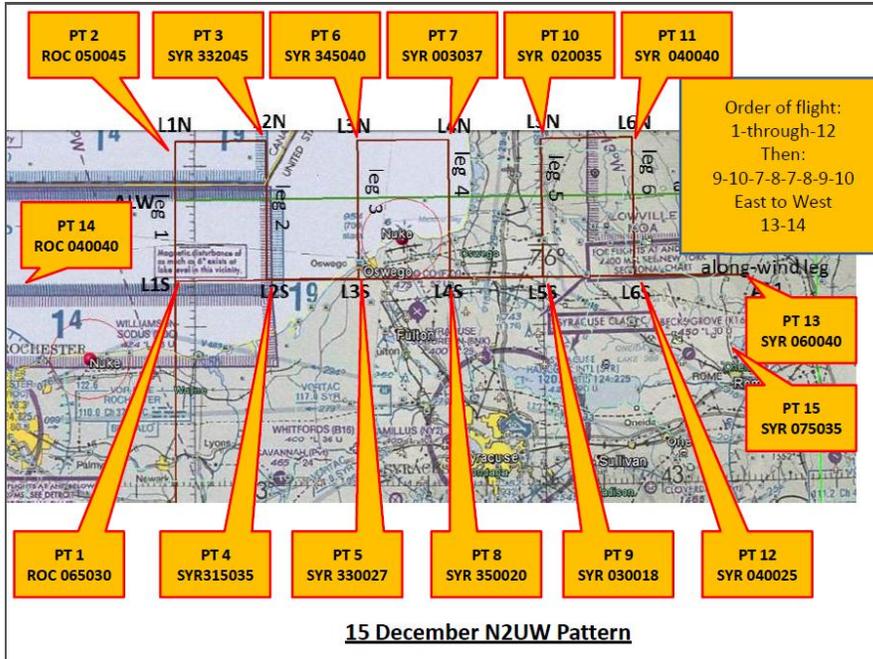
Be careful on the taxi. Taxiways are narrow, and now have snow berms on both sides, which starts building drifts with the winds out of the west. Another good chance for frozen brakes.

Getting N2UW back into the hangar after flight was a huge pain.

Interesting night.

Conclusion:

Most difficult ramp operation in support of a research flight I have ever encountered. Let's do tropical research after this.



OWLES13

Flight Notes—Jeff French, System Scientist

RF05, Dec15

Wadsworth, Geerts, French, Bergmaier

Preflight-

Long fetch flight targeted over eastern end of lake and south of Tug Hill, towards Oswego.

Anticipated takeoff 2230 Z.

Needed to fuel plane before startup (since we were in late on last flight). We had ~10 in snow prior day—icy ramp and blowing—took ~1+ hour to fuel plane. With snow blowing around, wings got contaminated with ice—needed to pull plane back in and wipe down. Took ~45 minutes to get plane in hangar (icy ramp, frozen hangar doors). At pullout, skin was cool enough so snow didn't melt.

Began snowing heavily about 15 minutes before loading into plane. The snowfall blocked the laser on the CIP. CIP was down first part of flight.

On startup, brakes were frozen. Wads was able to brake free. For clearance, delayed ~15-20 minutes for aircraft on approach path.

Flight-

2254 wheels up

Ferry to initial point—begin to setup for lawnmower

2311 – 2409 Began near cloud top lawn mower pattern at 10000 ft. about ~800 ft below cloud top. Conduct six legs (one each in leg 1 through 6). At 10000 ft, in constant ~.45 g/m³ liquid. By end of 3rd leg LWC100 is iced over and 2DP and CIP look iced over. Climb to 11000 ft to get above cloud and out of liquid, complete last 3 legs, mostly out of and above cloud.

Descend to 6 kft to focus on legs 4 and 5 (nearest shoreline) for next set of legs

2414 – 2505 Complete 5 legs at 6000 ft (5, 4, 4, 4, 5). Mostly outside of liquid. On leg 4 (over water) see some convective turrets with a few tenths lwc. At some point during this pattern the CIP and 2DP come back (graupel beat the rime ice off the probes).

Setup for east to west along wind leg at 6000 ft

2515 – 2544 Along wind leg. Generally right through middle of band. As we proceed further west, band gets more cellular—particularly around location of Legs 1 & 2, well out over the lake. At this locale encounter cells with ~ 1.2 g/m³ liquid, mostly in 'pocket' cells.

2609 Wheels down.

Postflight-

CIP, 2DP suspect for some portion of flight.

LWC100 likely bad for almost entire flight (upon landing, probe appeared to be almost entirely encased with rime)

AIAS suffered water ingestion early in flight. Winds based on AIAS suspect in flight. Noseboom was blown out prior to next flight.

Took all five of us and about 45 minutes to get plane in hangar due to icy/snowy tarmac.

OWLES 2013 RF-4 Post Mission Report

December 12, 2013

1. Crew: Wadsworth, Steiger, French, Johnston.
 2. Pre-Flight Brief: 1000
 3. Planned T/O time: 1700
 4. Flight Time: 3.6 Hrs
 5. Weather: VMC for T/O , Clear in all of western NY above ~ 11000'.
 6. Lowest cloud deck: <2000'
- A. Plan:

Planned to execute a “long-axis” lawnmower pattern on about a 265 alignment similar to the image shown at bottom of this. Filed for a departure off Rwy 19, to GIBBE, then the lat/longs of the desired points with an initial alt of 12000'.

The PI is now supplying a standardized format for the lat/long, names & sequence of the pattern to be flown. Arrives in the attached spreadsheet. This helps the planning process for the pilot substantially, but there is still a lot of work to do. My planning time was still 2 hours after receiving the spreadsheet with nav points. Fortunately I was able to preflight the aircraft earlier in the day, so that amount of time must be added to the 2 hour prep time.

After I got the UNS-1 programmed, the word came that we were delayed until a 1730 take off.

B. Execution:

I called El Mira Tower for my clearance. She read me the clearance, but with a “hold for release” as another aircraft was on-approach into KPEO. She said to call back in 10 minutes.

After the aircraft landed, I tried to call El Mira, about a dozen times. The line was busy, so I called Lockheed Martin flight clearance line. They gave me the clearance.

We were cleared to 12,000', so the next switch was to Cleveland Center. We started our descent to arrive over Pt 1 at 10,000'. We flew the pattern as shown. Agencies who controlled were Cleveland Center, Trenton Terminal, Boston Center.

After descending to 5000', the primary agency who controlled was Wheeler-Sack (“Sack Approach”). Very helpful, and not busy at 7:30 PM – 9 PM. Precip was again only heavy in the narrow (5nm wide) band of the lake storm. Little icing on the wings, probes, etc. It appeared that the snow pellets were scrubbing the wings of previous accumulation. Over Watertown, on the east shore, there was a terrible fish-bowl effect. Lots of illumination that

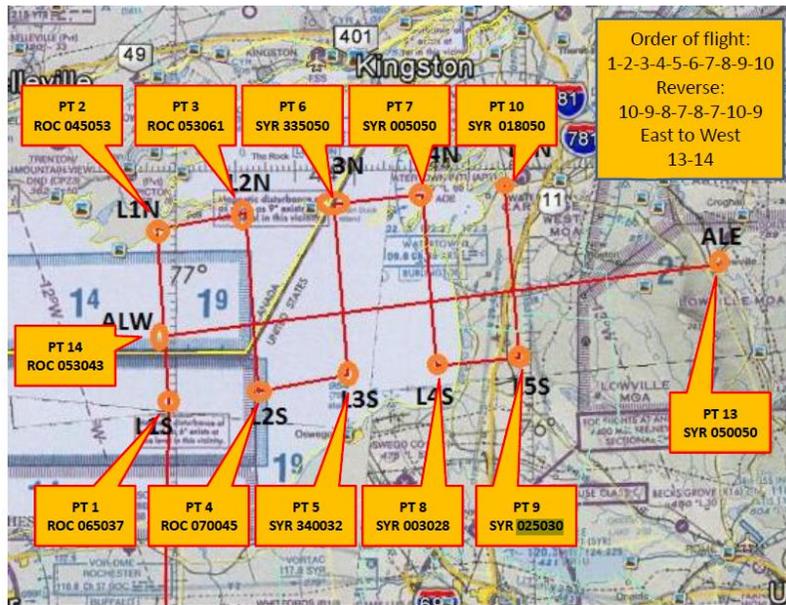
glowed all through the cloud that we were constantly immersed in. We could not see a single source of light, just a weird orange glow all around.

We cut off the last leg from 10 – 9 and just set up for the along-wind leg at 5000. We offset 12 miles to the north of the displayed track to better place the aircraft. After reaching the west end, I asked Trenton for a turn to the south. He gave it to me and handed me off to Cleveland. We had a little fuel left so we did a quick sounding back at point 1. Dropped down to min IFR (3300' with Cleveland) and then asked for a holding pattern, 5 mile legs south of the point and a climb to 12000. Then we headed back to Penn Yan.

About New York Center is now on the email distribution. I tried to call the guy, but only left a voice message.

Conclusion:

Lots of work to get ready to launch, still took 2.5 hours. A varsity night: lots of interaction with the controllers, lots of interaction with the PI as he adjusts the pattern a bit; high crosswinds that affect the north/south legs; long day; IMC from start to finish; icing; turbulence; night time. A full plate.



OWLES13

Flight Notes—Jeff French, System Scientist

RF04, Dec12

Wadsworth, Steiger, French, Johnston

Preflight-

Long fetch flight targeted over eastern end of lake and north of Tug Hill Plateau. A bit further north than RF03 from previous day.

Anticipated takeoff 2230 Z.

No issues on startup. Were ready to takeoff about 10 minutes early, but were delayed about 25 minutes to get clearance with aircraft coming in and then unable to reach ATC.

Flight-

2246 wheels up

Applanix died on takeoff—needed to reset several times—a number of NAV/GPS Position faults and Accelerometer bias faults. First ~45 minutes of data is questionable (especially for realtime).

Ferry to initial point—begin to setup for lawnmower

2312 – 2405 conduct one leg each of legs 1 through 5, first 3 at 10000 ft, last two at 11000. Generally clipping tops of the highest turrets in the band. Cannot visually see band as all levels are enveloped in ice cloud (and its dark!)

2314 – 2456 conduct 4 legs (5, 3, 3, 3) at 6000 ft – expect to be ‘in middle’ of cloud. Passes through band on legs 3 encounter ~1 g/m³ of lwc and 9 m/s updraft.

Proceed to eastn point of along wind leg

251? – 2540 Along wind leg (east to west) at 6000 ft. According to nexrad—appear to penetrate through the center of band.

2547 – 2556 on western end, south of band, conduct sounding from ~3300 ft to 12000 ft. – then return to Penn Yan

2016 Wheels down

Noticed around 2530 that CIP was not working (laser blocked)—appeared OK by landing. Likely blocked by ice.

OWLES 2013 TF-3 Post Mission Report

December 11, 2013

1. Crew: Wadsworth, Steiger, French, Bergmeier.
2. Pre-Flight Brief: 1000
3. Planned T/O time: 1300
4. Flight Time: 3.7 Hrs
5. Weather: IMC for T/O (broken deck), various broken to overcast layers below 2000' in area.
6. Lowest cloud deck: <2000'
 - A. Plan:

Planned to execute a "long-axis" lawnmower pattern on about a 270 alignment similar to the image shown at bottom of this. Filed for a departure off Rwy 01, to BEEPS, then the lat/longs of the desired points with an initial alt of 12000'.

Receiving the coordinates for the pattern at about 3 ¼ hours prior to the ultimate takeoff for these patterns and with the coordination required is not sufficient. I was busting my backside (in pilot-perspective) in order to fully identify all points, assign each of them a unique name for the FMS, identify them appropriately for display on the graphic that I send to all ATC reps, locate & identify all the points with VOR DME & radial, figure out the order of the pattern for programming into the FMS, send out the graphic along with a text description of what we plan to do to ATC, finally preflight the aircraft and program the FMS.

B. Execution:

I called El Mira Tower for my clearance. It can be a bit tough to hear the clearance. Most of the time they treat it just like the radio, and when they are ready to give the clearance, they say: "N2UW, clearance available, advise when ready to copy". Today, she just jumped on the phone and started reading the clearance. I swear she said cleared to BEEPS, particularly since that was where I was filed to, I was departing off Rwy 01, proceeding north.

Take off and departure was a bit interesting. She had given me the frequency for El Mira, but previously off Rwy 01, they had me contact Rochester when airborne. So, I checked in, they identified themselves as El Mira, and asked me to verify I was heading to GIBBE. Have I mentioned recently that they have some trainee's in the tower?

We sorted through the confusion, they cleared me to BEEPS, and on we went.

We were cleared to 12,000', so the next switch was to Cleveland Center. Generally they own above 10,000'. Their floor descends to the floor obviously beyond the lateral limits of the terminal controllers.

We went out to Pt 1 (on the companion graphic attached to the email), and descended to 2000' MSL (min IFR) to see if we could get below the overcast to do a low-altitude transit to Pt 2. We could not get below it, so we climbed back up to 12,000 direct to Pt 3. Somewhere in there we asked for a block of 10,000 – 12,000, received it, and flew the first lawnmower pattern at 10,500'. We flew in order: 3-4-5-6-7-8-9-10-11-12. We were near cloud tops, occasionally a through a convective buildup which topped out around 11k – 12 k. No lightning seen on any sensors. Not much of an event. Little to no ice accumulated on the aircraft. The Cleveland Controller was great. She had the graphic that I had sent (and for which I apologized about the fat-fingering of the VOR cuts to the points) and knew exactly what I was asking for / talking about. A common graphic solves almost every problem.

Cleveland kept us even when we went into Canadian airspace, and that was easy. She then passed us off to Boston Center when we crossed their border.

The ATCAA was active above FL180 over the LOWVILLE & CARTHAGE MOAs. I had called the scheduler (SSgt Jerri Lee) the night before to confirm. She is on the email distribution list for the daily notifications & updates. Zero impacts with the MOAs with any of the controllers.

We descended to 6000' MSL, (Boston Center passed us off to Syracuse Approach, who kept us for the rest of the flight) and flew points: 9-10-7-8-7-8-9-10. Between points 7 & 8 we encountered some heavier precipitation, with a pretty significant updraft which induced a climb rate then decent by the aircraft of ~600 fpm. After three passes through this band we still had only picked up about ¼ inch of ice on the boots & standard accumulation points on the aircraft.

After point 10, we descended to the minimum IFR for the area (which was 5100' MSL off the NE end of the lake over the ground) and prepared for the pattern: 7-8-7-10-9-12-11. As we turned back over the water from 10 and headed for 7, communication with Syracuse Approach indicated we could get to a minimum alt of 3600' MSL with a possible ~2200' MSL for a transit purely over the water. On the leg from 7 – 8, we got approval to descend to 2200', but we had popped out the south side of the moisture band at this point and wanted to turn north again. As well, we were only going to be able to get about ½ up that leg back toward Pt 7 before it was time to head for Penn Yan, so we initially stopped the descent at 3000', then when we started the reverse back to the north we climbed back to 3600'. Shortly after we headed for home.

All day, the XM weather was showing that KPEO was either VFR or marginal VFR. Chat from Glover on the way back indicated similar conditions. When I got the ASOS, it was the same. Sounded good.

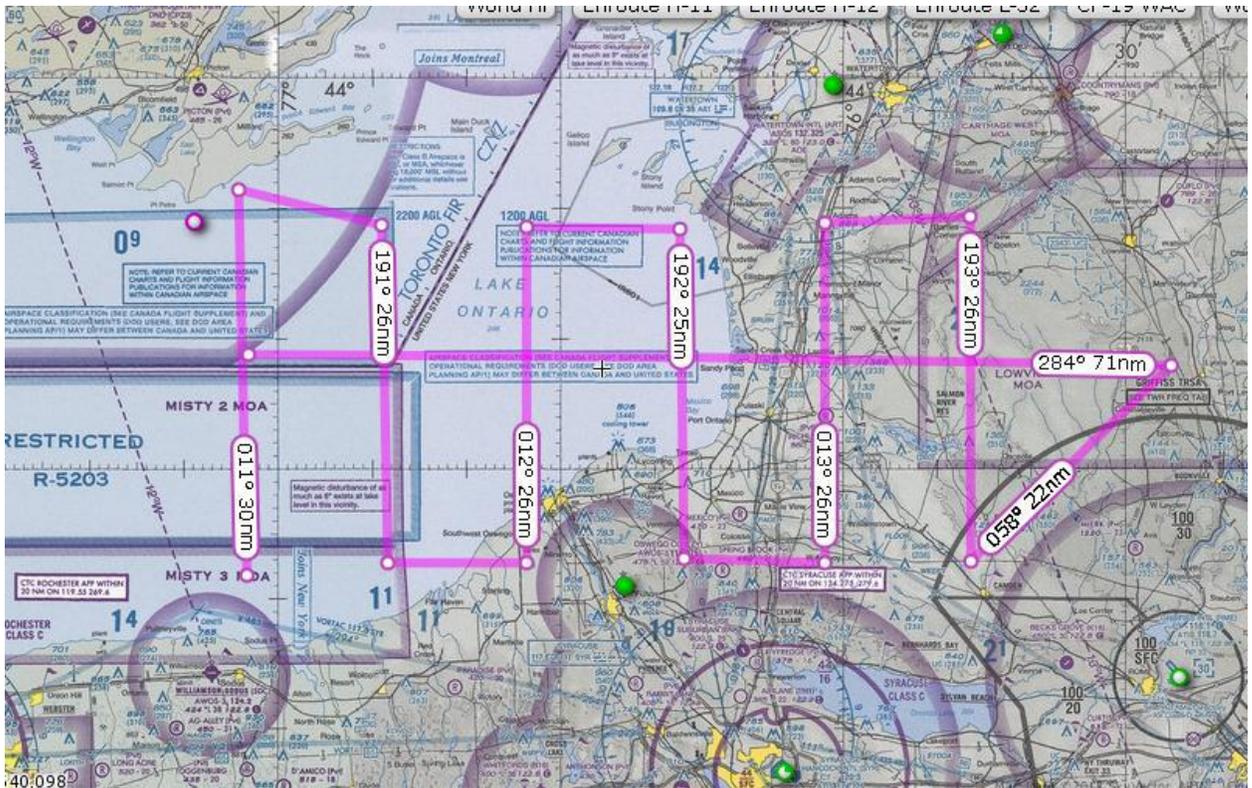
The balloon was not up today at all, because the activity was over Lake Ontario, so getting the approach was not a problem. I asked for & got the RNAV to 19, through WOWYE. It became clear pretty rapidly that the conditions at KPEO were not like what the ASOS had reported just shortly before. Ended up gaining a visual on the field at 1500' MSL.

Interesting day.

About 8 new additions to the email distribution list today.

Conclusion:

Good day. The preflight portion needs some tweaks to ensure I get the flight plan waypoints earlier in an appropriate manner.



OWLES13

Flight Notes—Jeff French, System Scientist

RF03, Dec11

Wadsworth, Steiger, French, Bergmaier

Preflight-

Long fetch flight targeted over eastern end of lake and Tug Hill Plateau.

Anticipated takeoff 1800 Z.

No issues on startup.

Flight-

1601 wheels up

Applanix died on takeoff—was able to reset with no issues

Ferry to initial point—begin descent for flux leg

1818 – 1830 descend down to minimum IFR to see if we can get VFR for flux leg. At 2000' still in IMC; abandon flux leg—climb and ferry to pt 1 for beginning of lawn mower pattern.

1841 – 1936 conduct one leg each of legs 1 through 5, all at 10500. Generally clipping tops of the highest turrets in the band. Cannot visually see band as all levels are enveloped in ice cloud

1942 – 2041 conduct 5 legs (4, 3, 3, 3, 4) at 6000 ft – expect to be 'in middle' of cloud. Passes through band on legs 3 encounter ~1 g/m³ of lwc and 10 m/s updraft.

2048 – 2104 conduct 1.5 leg (3, 3) at 3600 ft (lowest IFR in area). End second leg early as it is time to head home.

2138 Wheels down

OWLES 2013 TF-2 Post Mission Report

December 10, 2013

1. Crew: Wadsworth, Young, French, Bergmeier.
 2. Pre-Flight Brief: 1000ish
 3. Planned T/O time: 1130
 4. Flight Time: 3.7 Hrs
 5. Weather: VMC for T/O, various broken to overcast layers below 7500' in area.
 6. Lowest cloud deck: 3000'
- A. Plan:

Planned to execute a down-wind persistence pattern long-fetch lawnmower pattern on about a 270 alignment similar to the image shown at bottom of this. Only difference from the image, was that we did not plan to fly the westernmost north/south leg. Filed for a departure off Rwy 01, to BEEPS, then the lat/longs of the desired points with an initial alt of 8000'.

B. Execution:

I called El Mira Tower for my clearance. It took a little time as they are working with trainee's.

Take off and departure was no sweat. Went through BEEPS and turned west.

Checked-in with Rochester. No problems. We filed and transited at 8,000 so we stayed with Rochester initially, then they switched us to Cleveland Center. We flew each of the south/north legs of the depiction three times: once in the block of 8000 – 9000, then in the block of 5000 – 6000, then at the min IFR altitude for the area. Multiple switches of freqs for controlling agency. All controllers seemed to have a decent idea of what we were trying to do. I was prepared to tell them where I was planning to work based on VOR radial & dme.

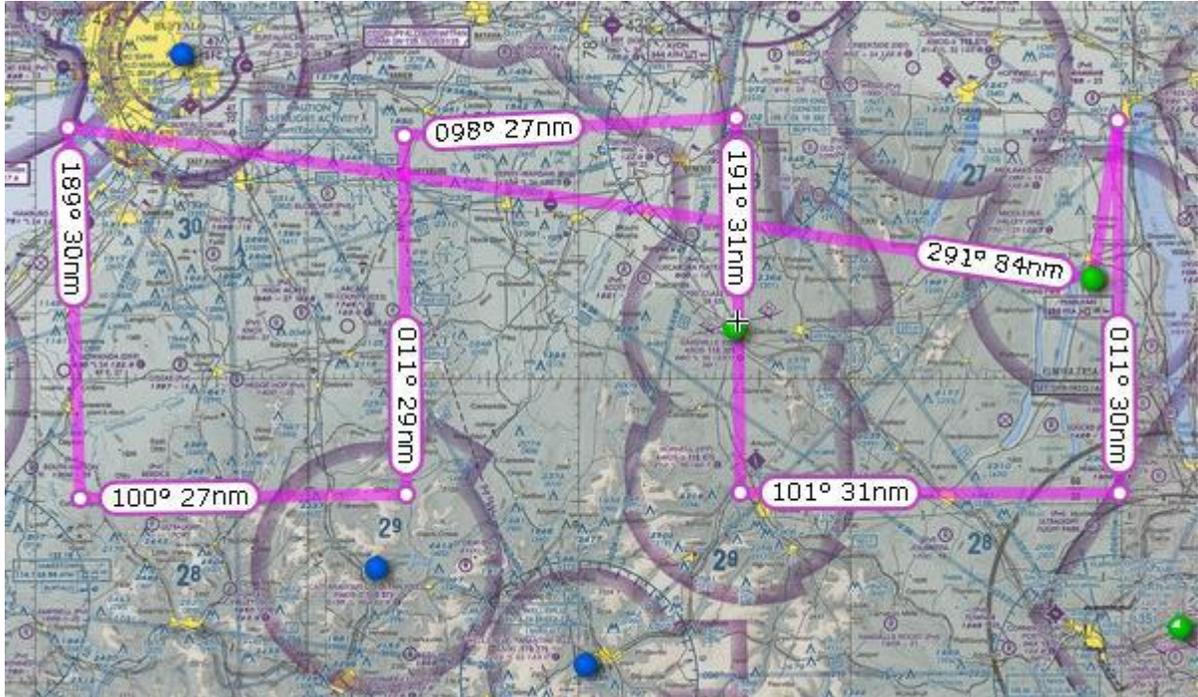
The last leg, the PI wanted to start 10 nm further south than what was planned. Also, we climbed to 10000'. This was down by El Mira, and New York Center owns a shelf of airspace here that goes down to 8000'. The controller did not seem to have a problem with us. I need to get a contact with them.

Icing was little-to-none on the aircraft. Some areas of turbulence with decent 'bumps', but otherwise, the conditions were not much of a factor.

About 8 new additions to the email distribution list today.

Conclusion:

Today went well - as easy as I first thought. The meeting with Rochester on Sunday was helpful. Tomorrow we go back over the lake again.



OWLES13

Flight Notes—Jeff French, System Scientist

RF02, Dec10

Wadsworth, Young, French, Bergmaier

Preflight-

Downwind persistence off of Lake Erie. Planning 3 N-S legs, each at 3 different altitudes. All legs are over land, highest is above cloud, middle is in 'center' of cloud, lowest is a bit above cloud base (as low as possible).

Anticipated takeoff 1630 Z (1130 local).

Issues with WCR on startup—appears to be network connector on radar control board. WCRserv continued to crash. Brent 'fiddled' with network connection on control board and it worked. No other issues during flight. No other issues on startup.

Flight-

1639 wheels up

Applanix died on takeoff—was able to reset with no issues

Ferry to initial point—setup for first leg

1713 begin leg 1a (western-most) at 8500' above cloud top. Visually the most cumuliform clouds are south of the radar echoes. We are flying right over where the echoes are located.

1723 end leg 1a

1728 -- 1740 leg 1b at 5 kft

1742 – 1754 leg 1c at 4 kft, MSL

Spiral ascent to 8500 ft

1808 – 1820 leg 2a at 8500 ft

1824 – 1835 leg 2b at 5000 ft

1839 – 1850 leg 2c at 4200 ft

Spiral ascent to ~9000 ft

???? – 1920 leg 3a at 10000 ft

1925 – 1940 leg 3b at 5000 ft

1943 – 1958 leg 3c at 3200 ft

Spiral ascent to 8000 ft

RTB

2018 Wheels down

wheels down

OWLES13

Flight Notes—Jeff French, System Scientist

RF01, Dec07

Wadsworth, Steiger, French, Young

Preflight-

Marginal research conditions—but want to fly pattern to check coordination & see how ground operations work, etc. Long fetch conditions with 270 degree orientation. Expect weak/showery conditions on the eastern/southeastern side of the lake.

Anticipated takeoff 1630 Z (1130 local). No issues on startup.

Flight-

1634 wheels up

Ferry to initial point—setup for flux leg

1702 begin descent over initial point; note cloud top at ~6800', cloud base at ~3200'

1712 begin flux leg ~500 ft AGL

171730 end flux leg

Climb to 7 kt to begin first lawnmower, note cloud tops at 6800 – 7000 ft as we transit to first point

~1725 begin first set of lawnmower legs at 7500 MSL—these legs get higher as we move east, by end of lawnmower, need to elevate to 8500 MSL

1808 end lawnmower on eastern end, descend to 5500 ft for second lawnmower (working east to west)

1812 begin 2nd lawnmower

1858 end lawnmower 2, setup for Alongwind leg

1905 begin Alongwind leg at 5500 ft

1932 end alongwind leg

RTB at 5500

NOTE—LWC100 becomes suspect from near end of alongwind leg through the end of flight. It looks like ice buildup on probe might be causing erroneous readings

2009 wheels down