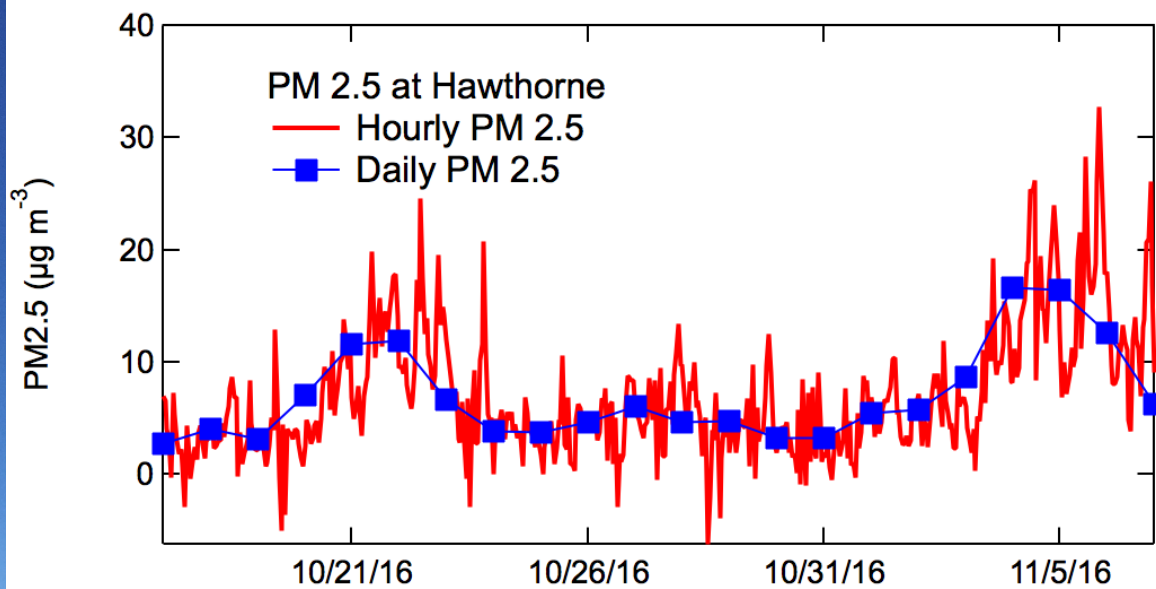


UWFPS Twin Otter Telecon, November 7 2016



1. Instrument updates
2. Current conditions in Salt Lake City
3. Potential updates to campaign schedule
4. New constraints on twin otter payload and some hard choices ☹️
5. Consumables ordering
6. Hazardous materials
7. Other items (to be decided between now and the next telecon)

Salt Lake City
November 5 2016



Potential Updates to Schedule

As of October 18, revised signed aircraft allocation from OMAO gives our project 86 hours and 38 days, a slight reduction

- January 2 integration start is still firm
- January 15 transit to Salt Lake is still firm
- February 13 transit back to Colorado may shift by one week if no further allocation or purchase of flight days or hours
- The aircraft is available to us through February 13, so:
 - Aircraft allocation may shift back to the full duration
 - CSD may consider funding the extra week

For now, please plan on campaign conclusion on February 15 as originally planned, but stay tuned for updates as this process moves forward

Site Visit to Salt Lake

Steve will visit Salt Lake this week and tour the TAC air hangar and ground sites with Munkh. Ron Pauley of NOAA / AOC will join visit to the hangar on November 10.

Logistical items to be discussed at hangar

- Space for instruments and equipment

- Hazardous materials and storage

- Aircraft power arrangement for non-flight days, pre-flights and in between flights (Ron)

- Badging and security

- Other?

Payload Constraints

Recent changes have pushed the payload above the previously established limit

1. AMS weight has increased by 40-60 lbs
2. NH3 QCL cannot operate without large pump and extra gas cylinder, increase of ~50 lbs
3. AOC has informed us of life raft requirement, increase of 70 lbs
4. Picarro is now available again. Good news, except 70 lbs of payload

Instrument Priorities (my view)

1. AMS
2. F CIMS
- 3 & 4. NOxCaRD and NH3 QCL (tie)
5. UHSAS
6. Picarro

Options

1. AMS + F CIMS + (NOxCaRD or NH3 QCL) + UHSAS + Picarro + 2 operators
Decide between NOxCaRD or NH3 QCL
Explore possibility of swapping NOxCaRD and NH3 QCL mid campaign
2. AMS + F CIMS + NOxCaRD + NH3 QCL + 1 operator (no Picarro or UHSAS)

Revised Payload Option 1

| Instrument | Power (kVA) | Weight (lbs) | Actual Power (kVA) | Actual Weight (lbs) | Notes |
|---------------------------|--------------------------------|--------------|--------------------|---------------------|-------------|
| AMS | 1.1 | 560 | 1.1 | 560 | |
| Iodide TOF CIMS | 1 | 380 | 1 | 380 | |
| NOxCaRD | 0.5 | 286 | 0.5 | 286 | |
| NH3 QCL | 0.93 | 219 | 0 | 0 | |
| Picarro CO (CH4) | 0.4 | 70 | 0.4 | 70 | |
| Met Probe | 0.1 | 7 | 0.1 | 7 | |
| Data Acquisition | 0.1 | 10 | 0.1 | 10 | Estimate |
| UHSAS | 0.1 | 49 | 0.1 | 49 | |
| Equipment Subtotal | | 1581 | | 1362 | |
| Pilots | | 360 | | 360 | 2 pilots |
| Scientists | | 360 | | 360 | 2 operators |
| Life raft | | 70 | | 70 | |
| Crew Subtotal | | 790 | | 790 | |
| Total | 3.93 | 2371 | 3 | 2152 | |
| Available | 4 kVA 115 VAC ~3 kVA 28 VDC | 2200 | 5 | 2200 | |

Revised Payload Option 2

| Instrument | Power (kVA) | Weight (lbs) | Actual Power (kVA) | Actual Weight (lbs) | Notes |
|---------------------------|--------------------------------|--------------|--------------------|---------------------|------------|
| AMS | 1.1 | 560 | 1.1 | 560 | |
| Iodide TOF CIMS | 1 | 380 | 1 | 380 | |
| NOxCaRD | 0.5 | 286 | 0.5 | 286 | |
| NH3 QCL | 0.93 | 219 | 0.93 | 219 | |
| Picarro CO (CH4) | 0.4 | 70 | 0 | 0 | |
| Met Probe | 0.1 | 7 | 0.1 | 7 | |
| Data Acquisition | 0.1 | 10 | 0.1 | 10 | Estimate |
| UHSAS | 0.1 | 49 | 0 | 0 | |
| Equipment Subtotal | | 1581 | | 1462 | |
| Pilots | | 360 | | 360 | 2 pilots |
| Scientists | | 360 | | 180 | 1 operator |
| Life raft | | 70 | | 70 | |
| Crew Subtotal | | 790 | | 610 | |
| Total | 3.93 | 2371 | 3.53 | 2072 | |
| Available | 4 kVA 115 VAC ~3 kVA 28 VDC | 2200 | 5 | 2200 | |

Consumables Ordering

Compressed Gases

Based on 15 research flight days in Salt Lake City, 1-2 test flight days + transit from RAF

I- CIMS

RAF: 4 size 50 A UHP N2 + 1 size 150 A UHPN2

Salt Lake: 17 size 50 A UHP N2 + 4 size 150 A UHP N2

NOxCaRD & NH3 QCL (each instrument has the same zero air requirements)

RAF: 4 size 50 A Ultra Zero Air + 1 size 150 A Ultra Zero Air

Salt Lake: 17 size 50 A Ultra Zero Air + 4 size 150 A Ultra Zero Air

NOxCaRD will additionally use 2 size 150 A 2 ppth NO in N2 shipped to Boulder only

AMS:

Will share zero air with NOxCaRD

Other consumables

University of Washington has provided a purchasing list – will coordinate with them

If other groups need consumables purchased and shipped to Boulder / RAF / Salt Lake, please notify me ASAP

Hazardous Materials – Salt Lake City Hangar

UWFPS Twin Otter Project - Hazardous Materials List

| Instrument | Item | Unit | Quantity | UN # | Notes |
|------------|------------------------------------|-------------------|----------|---------------------|--|
| NOxCaRD | Compressed air | 50 ft3, 2200 psi | 17 | | 1002 |
| | Compressed air | 150 ft3, 2200 psi | 4 | | 1002 |
| | Oxygen | 6 ft3, 2200 psi | 3 | | 1072 |
| | Nitric oxide in N2, 0.2% | 6 ft3, 2200 psi | 3 | | 1956 |
| | Helium | 6 ft3, 2200 psi | 1 | | 1046 |
| | Acetone | 100 mL | 1 | | 1090 |
| | Methanol | 100 mL | 1 | | 1230 |
| | Purafil SP Media (NOx scrubber) | 1 Kg | 1 | | Purafil |
| | Envicat (Catalytic O3 scrubber) | 1 Kg | 1 | | |
| AMS | Helium | 35 ft3 | 1 | | 1046 |
| | Ammonium nitrate | 25 g | 1 | | 1492 |
| | Ammonium sulfate | 25 g | 1 | Not dangeours goods | |
| | Apiezon L grease | 25 g | 1 | Not dangeours goods | |
| | Methanol | 500 ml | 1 | | 1230 |
| | Mini-Buck soap solution | 100 ml | 1 | Not dangeours goods | |
| | n-Butanol | 500 ml | 1 | | 1120 |
| | polonium-210 | 740 MBq | 1 | | 2915 |
| | polystyrene latex spheres in water | 120 ml | 1 | Not dangeours goods | |
| | Silica gel | 2 kg | 1 | Not dangeours goods | |
| I- CIMS | Compressed nitrogen | 50 ft3, 2200 psi | 17 | 1066 | |
| | Compressed nitrogen | 150 ft3, 2200 psi | 4 | 1066 | |
| | Methyl iodide | < 5g | 1 | | |
| | polonium-210 | 740 MBq | 1 | 2915 | |
| NH3 QCL | Compressed air | 50 ft3, 2200 psi | 17 | | 1002 |
| | Compressed air | 150 ft3, 2200 psi | 4 | | 1002 |
| | Silicon ortho phosphate | 1 L | 1 | | Ammonia scrubbing media |
| | Carbon | 2 L | 1 | | Purakol |
| | Potassium permaganate | 2 L | 1 | | Purafil |
| | Ethyl alcohol | 4 L | 1 | | 1987Chiller (will be prepared as 20% solution) |
| | Ammonia | - | 1 | | 1005Permeation device |
| | Perfluorooctylamine | 10 g | 1 | | 2735Inlet passivation |

Hazardous Materials – Salt Lake City Hangar

- Please check the hazmat list for completeness
- If you have not already sent me your MSDS for these items, please do so. I will store them electronically and provide paper copies in binders organized by instrument
- Please identify which items on your instrument list will be installed in the aircraft

Other Items

1. Firm schedule for integration
2. Shipping of instruments and equipment to Boulder / RAF / Salt Lake
3. Shipping between RAF and Salt Lake
4. Travel arrangements & schedules