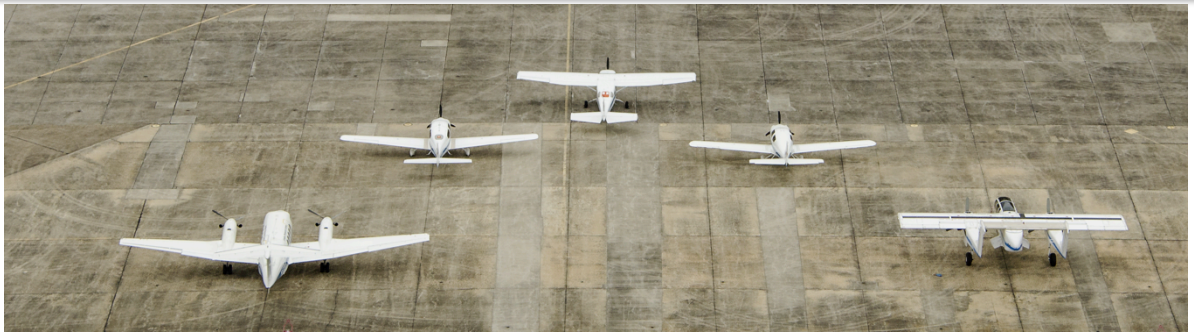
SnowEx Aircraft Selection Overview



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Aircraft Providers

An extensive search for possible available aircraft has been conducted. The following providers were contacted with respect to their various aircraft:

1. NASA (WFF, LaRC, AFRC, GRC)
2. NOAA
3. NCAR / NSF
4. NRL
5. Dynamic Aviation
6. Ken Borek Air
7. Twin Otter International

Requirements used to qualify each aircraft were mostly driven by the (potential) instruments themselves (operating altitude range, speed range, power requirements, mechanical interfaces, FOV's ,etc) .

Aircraft Criteria

For each campaign, the following scenarios were considered:

FOR FALL:

1. An aircraft that could fly up to two instruments (a LiDAR and a SAR) with a range of about 4 hours at 10kft or higher.

FOR SPRING:

1. One large aircraft that could accommodate an instrument in the nose (CAR), one looking nadir (LiDAR), another looking nadir but outside the fuselage (AESMIR), and a side-looking port for the SAR. In addition, the aircraft should have close to an 8 hour range and be able to fly at various altitudes.
2. Two aircraft, each holding two instruments. One holding the LiDAR and SAR (can be the same as the one used in the fall) and another holding CAR and AESMIR. Both aircraft should have a range of about 4 hours at various altitudes.

SnowEx Fall ConOps Assumptions and Aircraft Options

FALL 2016

ASSUMPTIONS

		Risks:	Risk Severity
Timeframe:	Oct-Nov 2016	1. Aircraft Availability	L = low
Science Hours	~50 (hours subject to change)	2. Aircraft Engineering Complexity	M = medium
Time in Field	~4 weeks (duration subject to change)	3. Aircraft Engineering Cost	H = high
Base of Operation	TBD, but somewhere in the US; assume Colorado for now; TBD location (THIS IS A PLACE SETTER ONLY. A final decision on location has NOT been made yet)	4. Aircraft Field Deployment Cost	
Instruments	Science team is down-selecting, but the options are: 1.LVIS and/or ASO 2.SnowSAR	5. Aircraft Range	

AIRCRAFT SUMMARY

AIRCRAFT	AVAILABILITY	RISK GRADES				
		1	2	3	4	5
LaRC B-200	Yes; UC-12B is available	**L**	**L** (LVIS only) **H** (SnowSAR)	**L** (LVIS only) **H** (SnowSAR)	waiting on cost	good
Dynamic Aviation (multiple aircraft)	In work - TBD	**L**	waiting	waiting	waiting on cost	good
LaRC Falcon	In work - TBD	TBD	waiting	waiting	waiting on cost	very good
LaRC Cesna 206	yes	L	TBD	TBD	TBD	
TOI Twin Otter	Yes	**L**	? -they didn't say	**L**	**L**	good

SnowEx Spring ConOps Assumptions and Aircraft Options

SPRING 2017			
ASSUMPTIONS			
Timeframe:	Feb-Mar 2017	**Risks:**	**Risk Severity**
Science Hours	~100 (duration subject to change)	1. Aircraft Availability	L = low
Time in Field	~4-5 weeks (duration subject to change)	2. Aircraft Engineering Complexity	M = medium
Base of Operation	TBD, but somewhere in the US; assume Colorado for now; TBD location (THIS IS A PLACE SETTER ONLY. A final decision on location has NOT been made yet)	3. Aircraft Engineering Cost 4. Aircraft Field Deployment Cost	H = high
Instruments	Instrument List: 1. SnowSAR 2. AESMIR 3. CAR 4. LVIS an/or ASO	5. Aircraft Range	

AIRCRAFT SUMMARY						
AIRCRAFT	**AVAILABILITY**	**RISK GRADES**				
		1	**2**	**3**	**4**	**5**
NOAA P-3	NOAA is checking availability; will know beginning of Feb.	**M**	**H**	TBD	**L-M**	very good
WFF C-130	Shows availability on ASP schedule (may need to move maintenance); BUT: WFF resources and manpower are limited	**H**	**H**	**H**	**M-H**	very good
J-31	TBD	TBD	TBD	TBD	TBD	TBD
NRL P-3	NO	TBD	TBD	TBD	TBD	very good
KBA Basler (or Twin Otter combo)	KBA is checking	TBD	TBD	TBD	TBD	TBD

Aircraft Discarded

The following is a detailed list of all aircraft discarded so far:

1. NASA:
    1. AFRC ER-2 (not big enough / too high altitude)
    2. AFRC Global Hawk (not big enough / too high altitude)
    3. AFRC Ikhana (not big enough)
    4. AFRC DC-8 (too expensive / availability not guaranteed)
    5. AFRC B-200 (possible mods needed, LaRC has better options on this)
    6. GRC Lear 25 (being retired)
    7. GRC Lear 35 (has no nadir ports)
    8. GRC Viking (not enough room for operators / major mods for instrument install)
    9. GRC Twin Otter (very limited power)
    10. WFF Sherpa (not enough support / high engineering effort)
    11. WFF P-3 (booked for the next 5 years)
    12. LaRC OV-10 (can only fit 1 instrument. Still haven't gotten them back from the Navy)

2. Others:
    1. Polar 5 and Polar 6 (not enough room)
    2. NCAR / NSF C-130 (needs new nose, cannot guarantee priority over NSF missions)
    3. Dynamic Aviation Dash-8 (No nadir ports. Requires major mods)