



SnowEx: a NASA airborne campaign leading to a snow satellite mission

SnowEx update: Aug 18, 2016

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Sponsored by NASA Headquarters/Terrestrial Hydrology Program Manager: Jared Entin

Outline



- **Welcome** – Ed Kim/C. Gatebe (3--5 min)
- **Schedule & Logistics** – Ed/Gatebe (5 min)
- **Ground truth/GBRS** – Kelly/Ludo/HP/Chris (5min)
- **Airborne**– Ed/Gatebe/M.Beckley (15 min)
- **Updates from HQ** – Jared Entin (5--10 min)
- **Q&A** – (10 min)

For more information, see snow.nasa.gov → snowex



SCHEDULE STATUS AND RISKS

Amy Misakonis

SnowEx Major Milestones



- 3rd survey due -- 8/11/16--DONE
- Fall manpower strawman -- 8/12/16 --DONE
- Fall invites started – 8/15/16 –in progress
- Winter panel convenes – during week of 8/22/16
- Winter decisions announced – week of 8/29/16
- Fall Deployment – 9/25/16 – 10/4/16
 - Ground Truth
 - ASO
- Instruments on Deck @ Aircraft Facility – 12/15/16
- Test Flight – 1/26/17 – 1/30/17
- Winter Deployment
 - Early GT Arrival – 2/1/17
 - Aircraft and GT Campaign – 2/6/17 – 2/24/17
- Final Data Delivery from all Instruments – 6/30/17



Ground truth/ Ground Based Remote Sensing update

K.Elder/L. Brucker/HP Marshall/C.Hiemstra

Ground truth & GBRS update



- A huge ‘thank you’ to all who responded to surveys. They are critical to get an accurate picture of what and who are available in a rapid but organized manner.
- With the compressed schedule for Year 1, the surveys are an important tool to find resources.
- We are trying very very hard to be inclusive, and the surveys help to make sure we are reaching out widely, and collecting info uniformly.
- We are gathering and processing extensive site data to determine where, specifically, we will want to sample. We expect to discuss this procedure, available datasets, and our approach in a future call.



SnowEx aircraft & instrument update

E.Kim/C.Gatebe/M.Beckley

Aircraft & Instruments for Each Deployment



- Fall 2016:
 - ASO on its aircraft
 - Lidar (1064 nm; 3.5 km/1m @ 3 km alt.)
 - Hyperspectral (350-1050 nm; $\pm 34^\circ$)
- Winter 2017:
 - NRL P-3
 - SAR (SnowSAR; X and Ku band polarimetric imaging radar, ~5m spatial resolution)
 - Passive microwave (AESMIR; 10, 19 and 37GHz; H and V; 200 m @ 600 m alt.)
 - BRDF (CAR) (multispectral: 340-2300 nm; iFOV: 1° /FOV: 180°)
 - Thermal IR (TBD)
 - ASO on its aircraft
 - Lidar
 - Hyperspectral
- Summer 2017 (SAR (SnowSAR); aircraft TBD)

NO CHANGE

Flight line planning assumptions 1



- Using preliminary flight line scenarios to allocate flight hours. Assuming 5 identical flights during Feb deployment.
- P-3 & ASO will do triangle flights: base-> GM -> SB -> base
- Assuming P-3 base will be either Colorado Springs or Hill AFB, Utah. TBC with NRL. Choice does affect total flight hours for science.
- ASO base = Grand Junction (GJT)

Flight line planning assumptions 2



- P-3 sensor swaths and ASO sensor swaths will overlap.
- 3 notional altitudes for P-3: very low, mid, high; all sensors taking data all the time.
- ASO at one altitude.
- Very low altitude (1000ft AGL): for smallest AESMIR footprints to 'fit' within width of strip forests; fore-aft elevation scanning to get range of incidence angles.
- Mid altitude: optimize for SnowSAR, notionally a few thousand feet AGL; 'mow the lawn' imaging of a box on the map; AESMIR will also get a conical scan image.
- High altitude: optimize CAR-hyperspectral (ASO) synergy; exact altitude TBD.
- Flight line 'box' on next slides will overfly LSOS

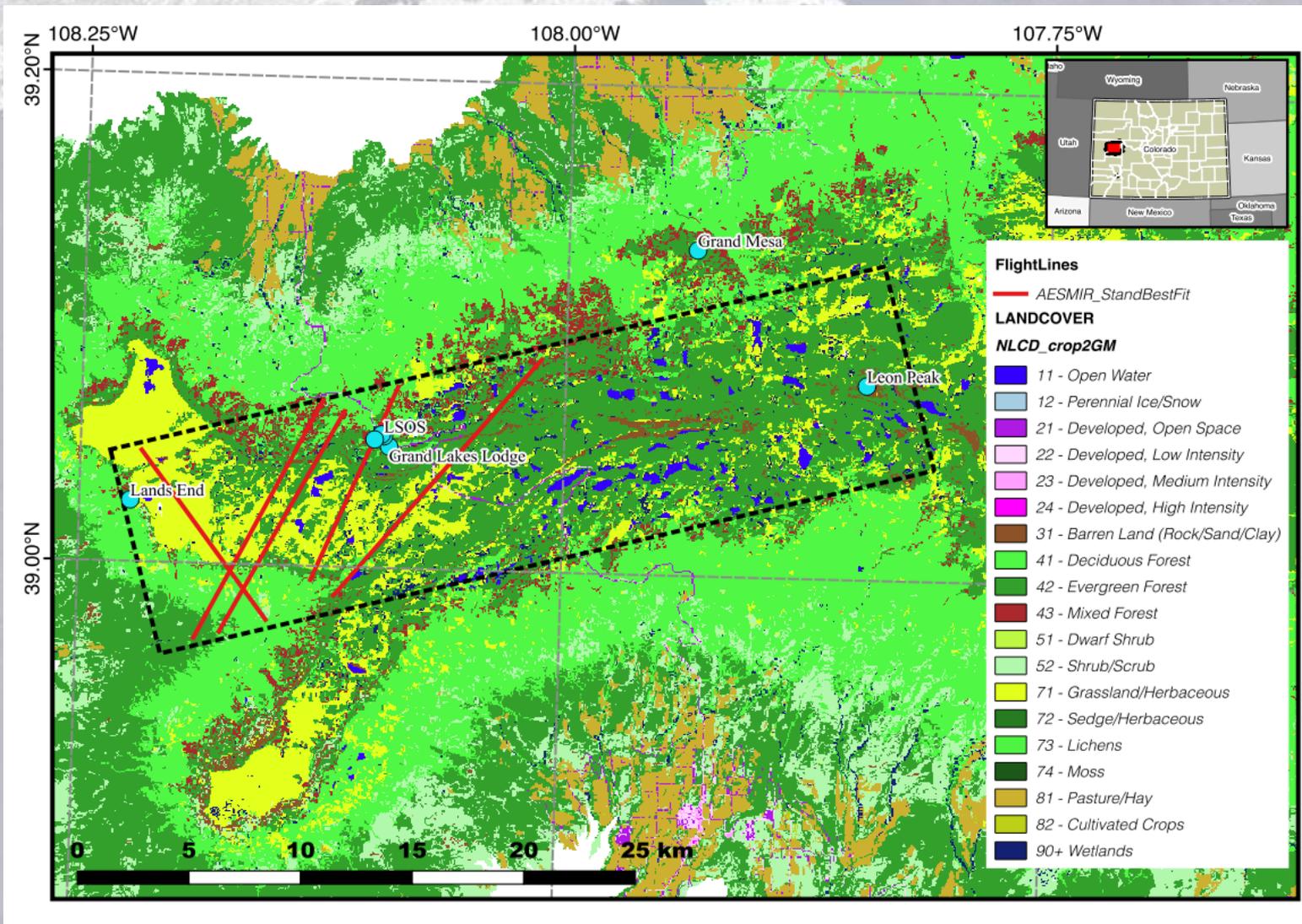
Flight line example 1



Example very low altitude lines in aqua color.

Rectangle with black dotted line is notional mow-the-lawn 'box' for all sensor except CAR.

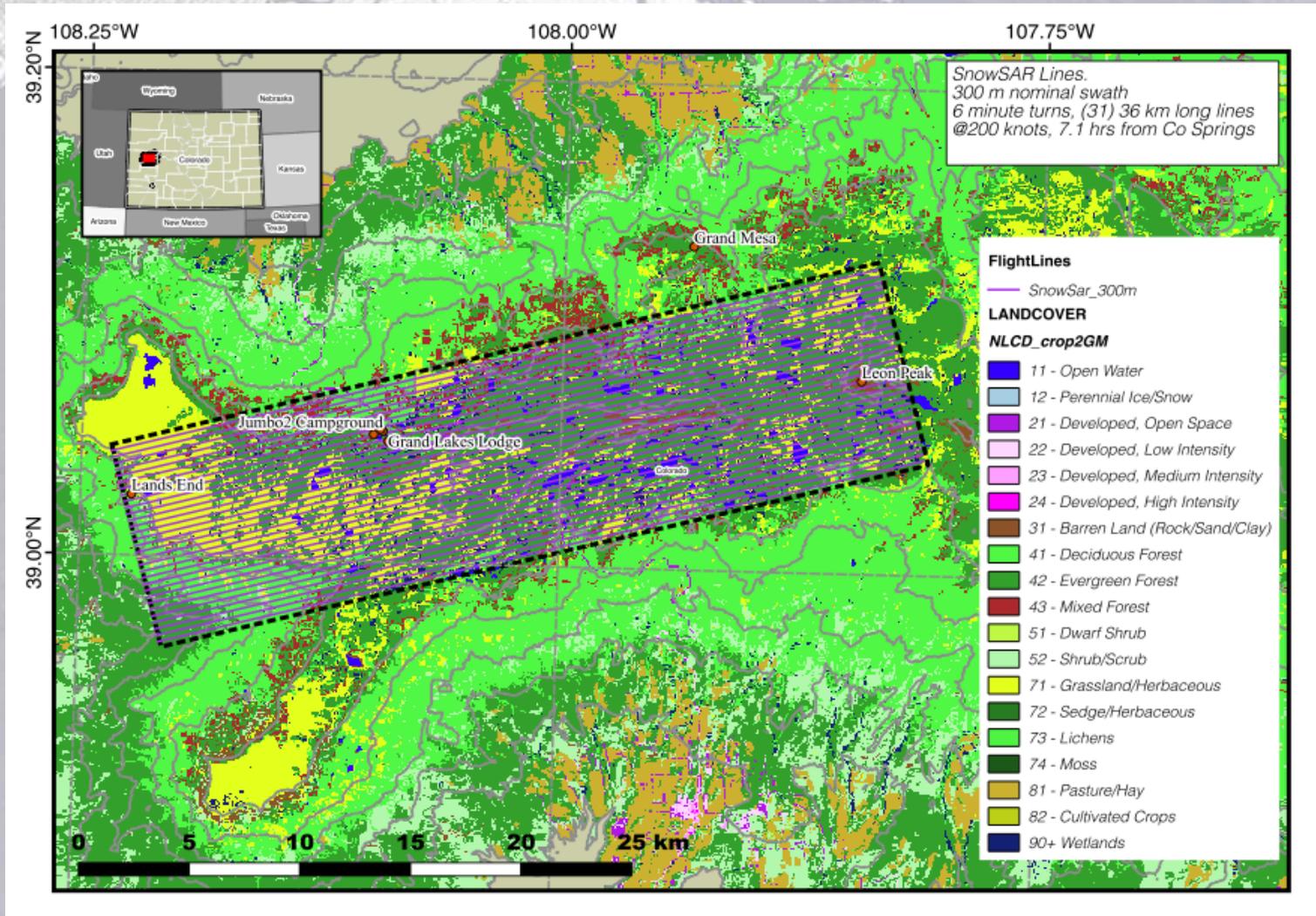
CAR would do circles over select non-forest & forest areas.



Flight line example 2



Notional flight lines for SnowSAR.





Update from HQ

Jared Entin



Q & A