

AERONET FIREX-AQ Field Campaign summary Tables

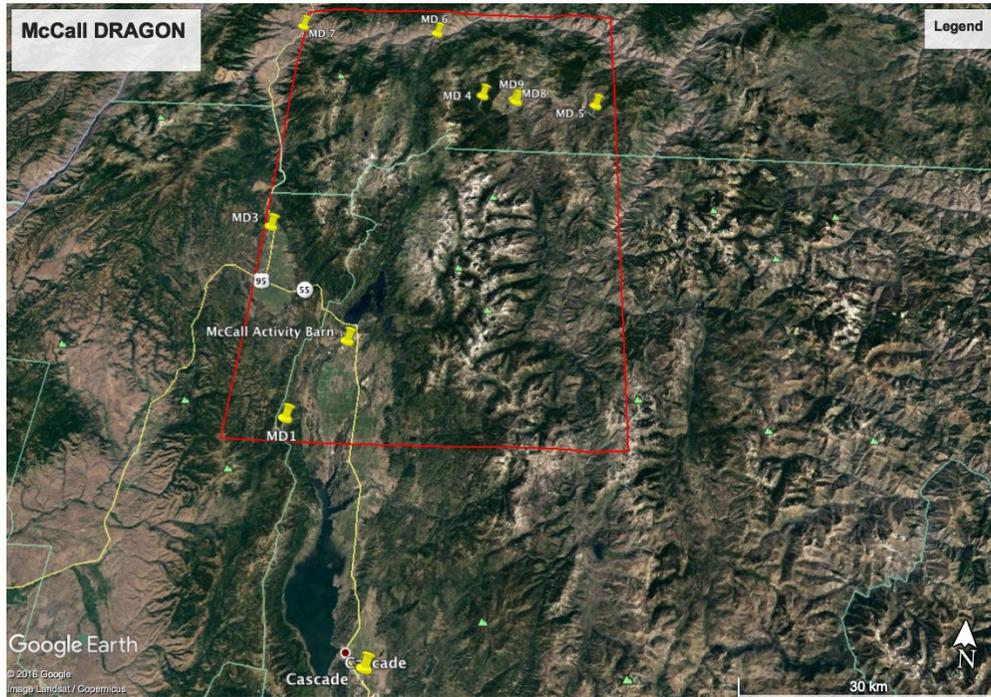
DRAGON Mobile (DM) Teams

Fire	Location	DRAGON Mobile (DM) Team	Date	Comment
Shady	Challis, ID	DM1	29 Jul	Lidar/Rain
Williams Flat	Ft. Spokane, WA	DM1	4-8 Aug	Active plumes; w/ 7 Aug: coordination ER-2, DC-8, LARGE
Pinehurst	Pinehurst, ID	DM1, DM2	8 Aug	Single plume,
Pipeline	Kennewick, WA	DM1	25-27 Jul	Plumes, high level
Nethker	Burgdorf, ID	DM1, DM2,	10-31 Aug	Smoldering/inversion
Granite Gulch	Joseph, OR	DM1, DM2	20-22 Aug	Regional Hz
204 Cow	Prairie City, OR	DM1, DM2	23-28 Aug	Regional Hz, Plumes

Fixed DRAGON Network Aerosol events

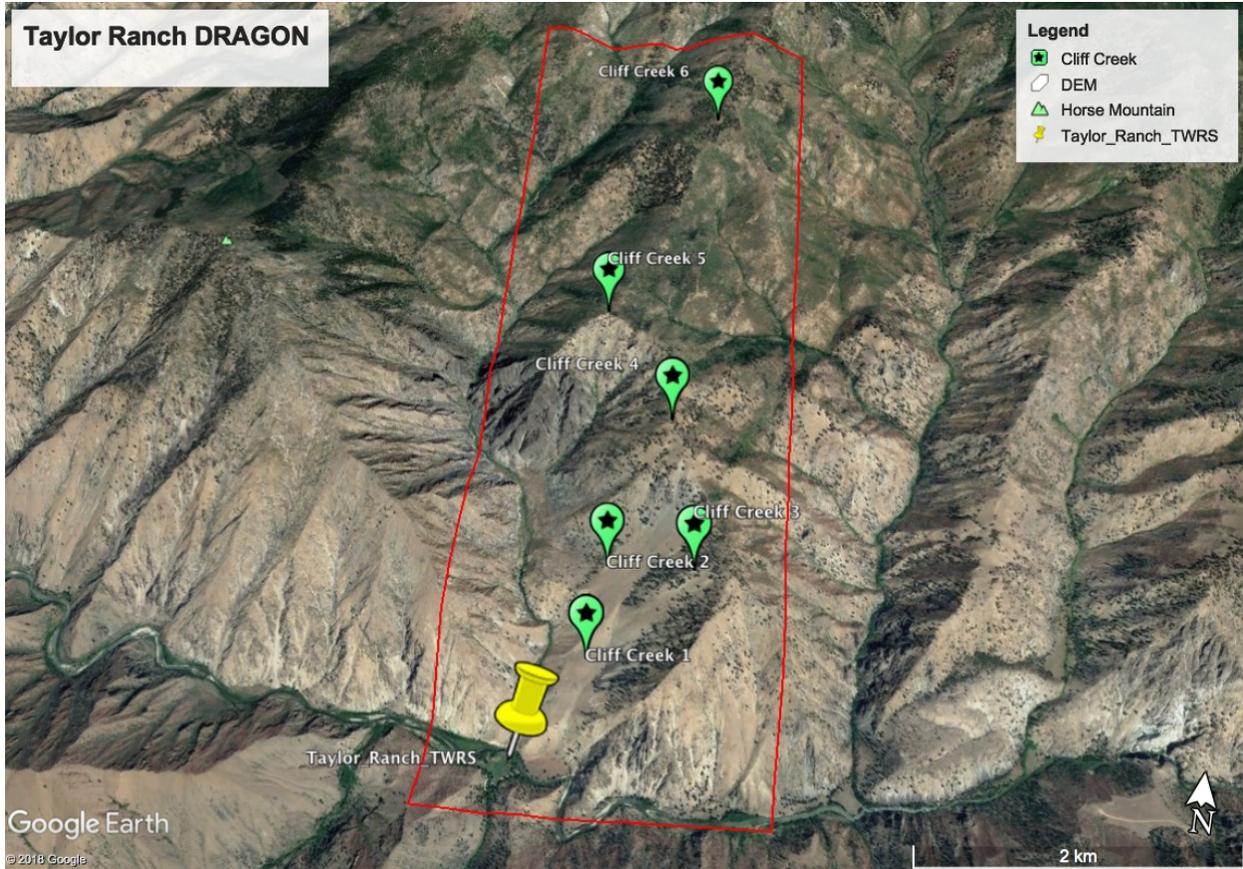
DRAGON	Aerosol Source	Date	Comment
McCall DRAGON	Nethker	5- 10 Aug	Plumes/haze
McCall DRAGON	Nethker	11-31 Aug	Shallow inversion AM, fog on 11th
McCall DRAGON	?	28 Jul- 4 Aug	~0.1 AOD above background
McCall DRAGON	Granite Gulch	21, 22	Night Spike
McCall DRAGON	Cow	29 Aug	Afternoon spike
Taylor Ranch	?	28 Jul- 4 Aug	~0.1 AOD above background
Taylor Ranch		16-17 Aug	Day/night spike
Taylor Ranch	Cow/GG	21-22 Aug	Day
Taylor Ranch	Cow	29 Aug	Day
Taylor Ranch	?	15-17 Sept	
Missoula	?	23-25 Jul	
Missoula	?	28 Jul	1 day spike
Missoula	?	29 Jul-3 Aug	
Missoula	BC	7-8 Aug	0.4 AOD threshold
Missoula	BC	16 Aug	Day night
Missoula	Southwest	22 Aug	
Missoula	Southwest	1-2 Sept	0.4 AOD threshold
Missoula	?	16 Sept	

McCall DRAGON



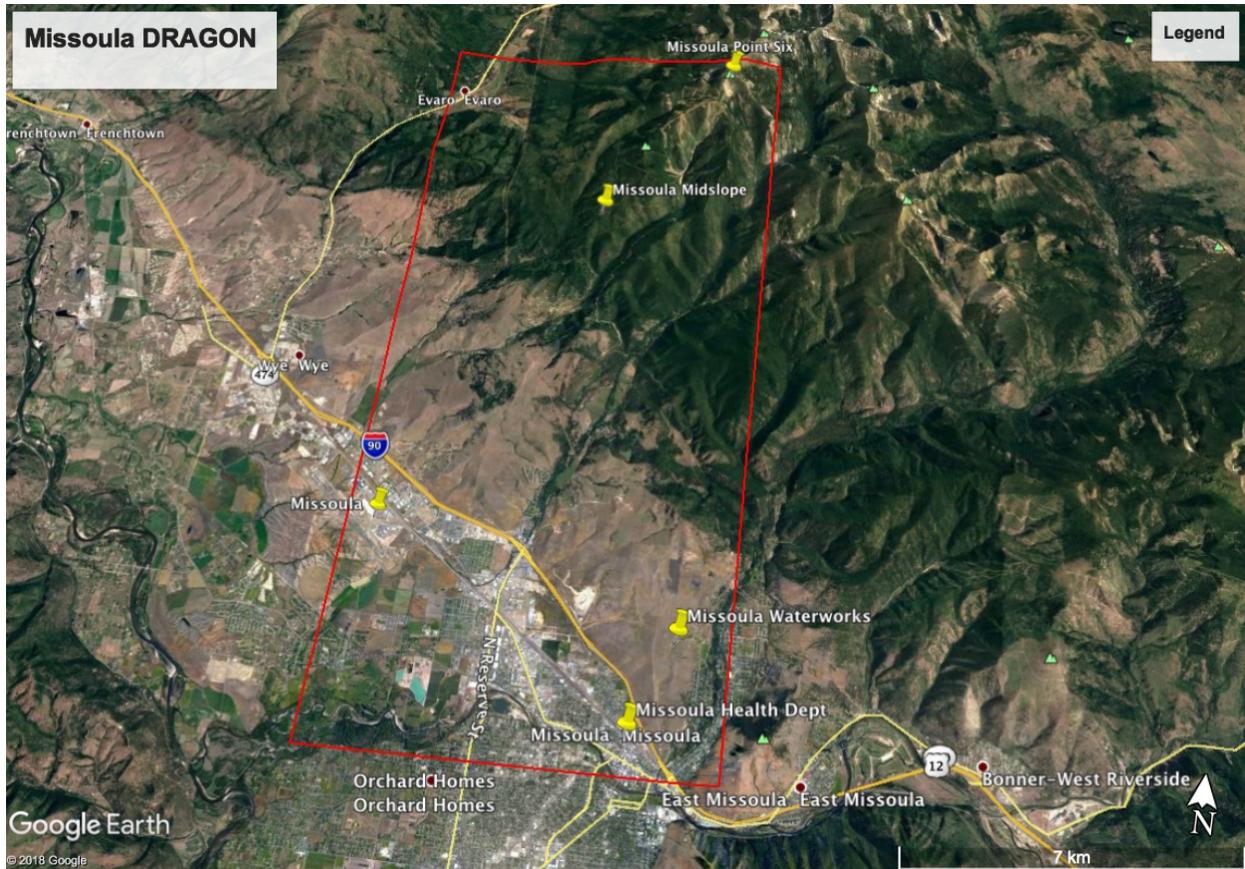
Site name	Local name	Lat/Long/Elev	Cover type	Comment
Cascade Airport	Cascade	44.50/-116.02/1447	Meadow/grassland	ed
MD1	Mt. No Business	44.76/-116.20/2247	Mtn. top	Lookout w/met
McCall AB	Activity Barn	44.89/-116.12/1524	Meadow	Town/rangeland/lakes Standard and Polar
MD3	Zims Hot Springs	45.04/-116.29/1179	Meadow	Town/rangeland, lower elevation
MD4	Burgdorf HS	45.28/-115.92/1865	Valley	Meadow edge/dense Mtn forest
MD5	Warren	45.27/-115.68/1774	Valley	Narrow Valley/forest burn scar
MD6	French Creek Grade	45.41/-116.03/1139	Grassland/woodland	Steep canyon slope
MD7	Riggins	45.41/-116.33/582	Canyon bottom/grassland	Steep canyon/town/river
MD8	Point David Grouse Creek	45.27/-115.85/1785	Secesh Valley/old burn	Temp smoke drainage site, polar
MD9	Twice Burned	45.27/-115.85/1875	Hill above MD8/old burn	Temporary profile

Taylor Ranch DRAGON



Site Name	Local Name	Lat/Long/Elev	Cover Type	Comment
TWRS	Taylor Ranch	45.10/-114.85/1159	Narrow Valley bottom	Airstrip buildings
Cliff Creek 1		44.76/-116.20/1351	Canyon side/grassland	South facing arid
Cliff Creek 2		45.12/-114.84/1552	Canyon side/grassland	South facing arid
Cliff Creek 3		45.12/-114.84/1727	Canyon side/grassland	South facing arid
Cliff Creek 4		45.28/-115.92/1865	Woodland	South facing some trees
Cliff Creek 5		45.13/-114.85/2068	Woodland	
Cliff Creek 6		45.14/-114.85/2232	Forest	

Missoula DRAGON



Site Name	Local Name	Lat/Long/Elev(m)	Cover Type	Comment
Missoula		46.917/-114.083/976	Urban Valley/USFS	
Missoula Health Dept.		46.88/-114.00/985	Missoula town	
Missoula Waterworks		46.88/-113.99/1107	Grassland	Near Mtn.
Missoula Midslope		47.00/-114.03/1613	Mtn slope/grassland	
Missoula Pt Six		47.04/-113.99/2420	Forested	

Collaborative measurements were taken with the AERONET DRAGON activities. Most are mentioned in the following activity reports however the following table details several of the co-located measurements/datasets.

Activity	Location	Measurement	Date	Comment
Purple Air	Activity Barn	PM 2.5	5 Aug – 1 Sept	Multiple instruments
Purple Air	MOSS	PM 2.5	5 Aug continuing	At conf yurt
Purple Air	Secesh	PM 2.5	28 Aug cont.	Connection issues, POC John and Julie
Purple Air	LCSC	PM 2.5	7 Aug Cont.	POC Dr. Johnston
MPLNET	MOSS	Ext. Profiles	22 Jul-20 Aug	POC: J. Welton
Planet Dove	McCall DRAGON	Daily RGB Img	22 Jul-6 Sept	3.5 m res, <25% cc
Planet Dove	TR DRAGON	Daily RGB Img	22 Jul-6 Sept	3 m res, <25% cc
Planet Dove	Missoula DRAGON	Daily RGB Img	22 Jul-6 Sept	3 m res, <25% cc
Skysat stereo	All fixed DRAGONS	Pan triplicate stereo, DEM	Single Date acquisition	0.8 m res
In Situ sampling	Missoula, UM	CO, NO, NO ₂ , O ₃ , Babs, Bscat, AAE	Early May to late Sept.	POC: Bob Yokelson
In Situ sampling	<Missoula, UM	SO ₂ Hg	Mid Aug. to 9/26	NOAA
In Situ sampling	Missoula, Activity Barn	VOC	Aug	POC: N. Johnston/LCSC
AWS (FS)	Nethker, (Spike Camp, Crystal Mtn, Cary Dome)	Temp, winds	Aug 6-Sept 1	(208)501-4261, USFS Remote Sensing

Activity report FIREX – DM1

POC: David Giles, Anthony LaRosa, Philippe Goloub, Luc Blarel
Lilia Proniewski, Gael Dubois, Ioana Popovici, Thierry Podvin



Instruments	Details
CIMEL CE318-T Shipborne Photometer	340, 380, 440, 500, 675, 870, 937, 1020 and 1640 nm filters
CIMEL CE376 LIDAR	532 and 808 nm, co- and cross polarized channels
Tenum Calitoo Sun Photometer	465, 540 and 615 nm filters
Microtops II Sun Photometer	380, 440, 675, 870 and 1020 nm filters

Date: 23 July 2019

Team: DM1 (Anthony/Lelia)

Location: MOSS, McCall, ID

Accomplishment/Activity: Prepared SUV sun photometer and 2-band Cimel lidar and plan for E. WA fire. Vehicle integration not fully completed.

Comments/Conditions: No smoke locally, grass and woodland for target fire on E. slope of Cascades. No airborne or other ground assets are known.

Date: 24 July 2019

Team: DM1 (Anthony/Lelia)

Location: MOSS, McCall, ID

Accomplishment/Activity: Continued preparations for DM1. Car successfully integrated all instrumentation. Performed tests with ship photometer around McCall. Lidar measurements by night at MOSS, McCall, ID

Comments/Conditions: Planned where DM1 would go in the morning.

Date: 25 July 2019

Team: DM1 (Anthony/Lelia)

Location: Kennewick, WA

Accomplishment/Activity: mobile McCall, ID to Kennewick, WA. Stopped in Lewiston, ID to meet with Lewis and Clark professor. Took measurements on Rimrock (hybrids and almucantars). Lidar measurements by night at Kennewick, WA.

Comments/Conditions: Some high level smoke overnight noticed coming from direction of Yakima, WA, where Pipeline Fire is located.

Date: 26 July 2019

Team: DM1 (Anthony/Lelia)

Location: Ellensburg, WA

Accomplishment/Activity: mobile Kennewick, WA to Ellensburg, WA. Traveled to Yakima and Ellensburg area via dirt road, got close to Pipeline Fire. Winds were not blowing in the right direction. Fire inaccessible. Lidar measurements by night at Yakima

Comments/Conditions: Pipeline Fire - partially extinguished and inaccessible by car

Date: 27 July 2019

Team: DM1 (Anthony/Lelia)

Location: Moscow, ID

Accomplishment/Activity: mobile Yakima, WA to Moscow, ID and lidar measurements by night at Moscow. Mostly clear conditions.

Comments/Conditions: problem with lidar after going on rough unpaved roads, signal was weak.

Date: 28 July 2019

Team: DM1 (Anthony/Lelia)

Location: MOSS, McCall, ID

Accomplishment/Activity: realignment of lidar reception channels at MOSS

Comments/Conditions: lidar alignment was altered. No data.

Date: 29 July 2019

Team: DM1 (Anthony/Lelia)

Location: Challis, ID & Shady Fire

Accomplishment/Activity: Set up lidar back in DM1 and mobile McCall, ID to Challis, ID Lidar measurements by night at Challis (but clouds and rain) at 2AM.

Comments/Conditions: No more smoke when DM1 arrived; LARGE Mobile Lab already there; clouds and storm coming up in direction of Challis; rain, wind and lightning start just before arriving to Challis.

Date: 30 July 2019

Team: DM1 (Anthony/Lelia)

Location: Hamilton, MT

Accomplishment/Activity: mobile Challis, ID – Hamilton, MT. Some storms passed and clouds built in the area. Relocated to Hamilton, MT. Overcast conditions.

Comments/Conditions: storm started around 10 AM LT, so stop measurements. Resumed on way to Hamilton, more clouds. Then rain around 5 PM. Overnight lidar.

Date: 31 July 2019

Team: DM1 (Anthony/Lelia)

Location: MOSS, McCall, ID

Accomplishment/Activity: Moved from Hamilton, MT to MOSS via the Bitterroot Forest. Very thin amount of smoke visible by the eye, negligible.

Comments/Conditions: Sun photometer GPS struggled with deep forest and mountains. Good PLASMA data from DMU2.

Date: 1 August 2019

Team: All

Location: MOSS, McCall, ID

Accomplishment/Activity: lidar measurements by night at MOSS

Comments/Conditions: presentation of PHOTONS activity (Philippe Goloub) and writing of a technical and instrument check-up note for the 2 DRAGON Mobile Units

Date: 2 August 2019

Team: All

Location: MOSS, McCall, ID

Accomplishment/Activity: Perform maintenance to instrumentation. Lidar measurements by night at MOSS.

Comments/Conditions: No mobile data collected

Date: 3 August 2019

Team: All

Location: MOSS, McCall, ID

Accomplishment/Activity: lidar measurements by night at MOSS

Comments/Conditions: Some measurements performed between McCall and Boise during personnel transition; exchange of teams (Dave replaces Anthony).

Date: 4 August 2019

Team: DM1 (Dave/Lelia)

Location: Williams Flats Fire

Accomplishment/Activity: Arrived in Fort Spokane, WA, area to sample smoke plume. Lidar was powered overnight at Hunters, WA

Comments/Conditions: Fire in Colville Reservation, WA; smoke visible to the eye, smoke elevated.

Date: 5 August 2019

Team: DM1 (Dave/Lelia)

Location: Fort Spokane, WA

Accomplishment/Activity: Mobile on the E side of the fire (across Columbia River, which is separating from reaching the fire). Performed plume transect from north to south and sampled diffuse smoke plume south of Williams Flats fire. Lidar was powered overnight at Fort Spokane, WA.

Comments/Conditions: Smoke elevated. No airborne assets are known. Rendezvoused with AERONET Mobile 2 and LARGE lab at Fort Spokane, WA. Coordinated with LARGE and DRAGON Mobile 2.

Date: 6 August 2019

Team: DM1 (Dave/Lelia)

Location: Fort Spokane, WA

Accomplishment/Activity: Measured diffuse plume to the north in the morning and return to convective plume in the afternoon. Fire moved over ridge east towards Columbia River in the afternoon and black

ash and white ash fell on east side of Columbia River. Several successful hybrid retrievals were performed south of plume. Lidar was powered overnight at Fort Spokane, WA.

Comments/Conditions: William Flats Fire; lidar signal saturated at low altitudes due to heavy smoke – couldn't pass higher than 1 km agl; LARGE Mobile Lab and DMU2 in the region; DC-8 and ER-2 flights;

Date: 7 August 2019

Team: DM1 (Dave/Lelia)

Location: Fort Spokane, WA

Accomplishment/Activity: Measurements at Fort Spokane, WA; sampled to the south and then into convective plume in the afternoon and sampled again to the north. Sky became cloudy during the late afternoon and evening. No power was available for lidar overnight.

Comments/Conditions: William Flats Fire; the fire increased in intensity due to drought and heat in the region and strong winds from W. ER2 overflight near plume source; DC8 flyover on north edge of plume (at least twice). LARGE team departed for Boise. Coordinated with DRAGON Mobile 2.

Date: 8 August 2019

Team: DM1 (Dave/Lelia)

Location: Lewiston, ID / William Flats Fire

Accomplishment/Activity: mobile Kettle Falls, WA – Lewiston, ID; Measured downwind plume to the east however data likely cloud contaminated.

Comments/Conditions: ER-2 overflight along Mobile tracks from Fort Spokane, WA to Pinehurst, ID. Travelled to Pinehurst ID to fix permanent AERONET site installation. Smoke was observed very near to the Pinehurst, ID site.

Date: 9 August 2019

Team: DM1 (Dave/Lelia)

Location: McCall, ID

Accomplishment/Activity: from Lewiston to McCall - no mobile data because lidar shut down due to high humidity inside the enclosure; stationary measurements at The McCall Activity Barn

Comments/Conditions: Preparation for Media Day; All mobile labs are present (LARGE, Aerodyne, DMUs); No measurements by night at MOSS because rain is forecasted

Date: 10 August 2019

Team: DM1 (Dave/Lelia)

Location: McCall, ID

Accomplishment/Activity: stationary measurements at MOSS and mobile at Nethker Fire

Comments/Conditions: stop measurements during the day at MOSS around 10 AM LT due to rain; Presence at Media Day; Beginning of measurements inside Nethker Fire (Payette National Forest) – very dense smoke, localized around the main road and at low altitudes; Night measurements from 7 PM-3 AM LT; Mobile inside and outside of the smoke; lunar measurements at some points along the main road; LARGE and Aerodyne Mobile labs present; Arrival of Ioana

Date: 11 August 2019

Team: DM1 (Dave/Ioana)

Location: McCall, ID

Accomplishment/Activity: mobile inside and outside Nethker Fire

Comments/Conditions: low clouds (1-2 km agl) and intermittent rain; day and night measurements (1 PM-2 AM LT); smoke at very low altitude (<500 m agl - visible on data and by eye); some lunar measurements taken inside the smoke; smoldering smoke and active fires seen by the sides of the road; Airborne measurements; Aerodyne present; Heavy smoke at surface level around midnight (below 200 m agl; lidar signal completely attenuated)

Date: 12 August 2019

Team: DM1 (Dave/loana)

Location: McCall, ID

Accomplishment/Activity: mobile inside and outside Nethker Fire (3 PM-9 PM LT) . Stationary lidar measurements by night at Dave point

Comments/Conditions: intermittent low level clouds (1-2 km agl); AOD=0.1 at 465 nm, Angstrom Exponent (465/615nm) =1.3 just outside of the smoke area

Date: 13 August 2019

Team: DM1 (Dave)

Location: McCall, ID

Accomplishment/Activity: stationary measurements at Dave point. Mobile from Nethker Fire to MOSS and stationary lidar measurements at MOSS

Comments/Conditions: -

Date: 14 August 2019

Team: DM1 (Dave/loana)

Location: McCall, ID

Accomplishment/Activity: mobile MOSS to Nethker Fire. Mobile inside and outside Nethker Fire and lidar measurements by night at Dave point

Comments/Conditions: fog and smoke (smog) at the surface level, below 400 m agl; stop lidar around noon while stationary because the temperature inside is too high

Date: 15 August 2019

Team: DM1 (Anthony)

Location: McCall, ID

Accomplishment/Activity: mobile Nethker Fire to MOSS. Stationary lidar measurements by night at Dave point

Comments/Conditions: clear sky, sunny; lunar measurements; stop lidar around noon when temperature is too high; loana in DMU2

Date: 16 August 2019

Team: DM1 (Anthony)

Location: McCall, ID

Accomplishment/Activity: stationary measurements (night and day) at Dave point

Comments/Conditions: stop lidar around noon when temperature is too high; loana in DMU2

Date: 17 August 2019

Team: DM1 (Anthony)

Location: McCall, ID

Accomplishment/Activity: stationary measurements (night and day) at Dave point

Comments/Conditions: stop lidar around noon when temperature is too high; Ioana in DMU2

Date: 18 August 2019

Team: All

Location: Idaho

Accomplishment/Activity: no measurements

Comments/Conditions: day off

Date: 19 August 2019

Team: DM1 (Anthony/Ioana)

Location: McCall, ID

Accomplishment/Activity: mobile inside and outside of Nethker Fire then back to MOSS

Comments/Conditions: last day of measurements at Nethker Fire

Date: 20 August 2019

Team: DM1 (Anthony/Ioana)

Location: Joseph, OR

Accomplishment/Activity: mobile McCall, ID to Joseph, OR. Lidar measurements by night at Joseph

Comments/Conditions: Granite Gulch Fire (Wallowa-Whitman Mountains) – smoke visible when reaching Joseph, layers up to 4 km agl, AOD=0.8 at 465 nm; stops at DEQ stations along the road from McCall to Lewiston (Grangeville, Cottonwood, Lewiston) to compare the AirBeam (particle counter) data

Date: 21 August 2019

Team: DM1 (Anthony/Ioana)

Location: Joseph, OR

Accomplishment/Activity: mobile from Joseph towards W (Elgin, OR) until we see no contribution of smoke

Comments/Conditions: Granite Gulch Fire - haze all over the valley but low AOD (~0.2 at 465 nm); Hybrid measurements; higher AOD (0.32) when taking road to Lostine, but go back to Joseph as clouds move in; storm at night so no night measurements

Date: 22 August 2019

Team: DM1 (Anthony/Ioana)

Location: Halfway, OR

Accomplishment/Activity: mobile Joseph, OR –to Lostine, OR in the morning but no smoke. Mobile Joseph-Halfway, OR and lidar measurements by night in Halfway

Comments/Conditions: low level clouds in the morning, sky clearing up in the afternoon; low AOD along all mobile transect from Joseph to Halfway, crossing Wallowa Mountains (0.08 at 465 nm at Hell's Canyon Lookout); NW winds; go to Cornucopia, OR in the afternoon to get closer to the smoke but no smoke in this direction; low winds, smoke maybe directed towards Joseph

Date: 23 August 2019

Team: DM1 (Anthony/Ioana)

Location: Unity, OR

Accomplishment/Activity: mobile Halfway, OR to Unity, OR. Lidar measurements by night at Unity

Comments/Conditions: low AOD at Halfway in the morning and along the road (0.06-0.08 at 465 nm); Reach 204 Cow Fire (Malheur National Forest) around noon - starting to see smoke after descending

from mountains coming from Baker, smoke flooding the valley when arriving near Unity (AOD 0.65 at 465 nm); take a road up on the mountain in the afternoon, see if we can get closer to the fire; stop and return to Unity as nothing is seen on this side of the mountain, smoke probably moved into Prairie City (check wind direction)

Date: 24 August 2019

Team: DM1 (Anthony/Ioana)

Location: 204 Cow Fire, OR

Accomplishment/Activity: mobile Unity, OR to Prairie City, OR (N of fire area), then cross through the smoke area and descend to Unity. Mobile by night at the base of the mountains, SE side of fire, then mobile to Juntura, OR, passing through Vale. Lidar by night at Juntura

Comments/Conditions: 204 Cow Fire; low AOD in the morning in Unity and Prairie City (0.06 at 465 nm); as we descend from the mountain into Unity (SE side of the mountain) in the afternoon, the AOD increases significantly (2.2 at 440 nm), sky and sun are orange; we are descending in the same direction as the wind brings the smoke (NW winds pushing smoke to SE); smoke plumes are passing in front of the sun so AOD highly variable, but Angstrom Exponent seems stable (2.5-2.6 at 465/615 nm); when reaching the fire area, thick smoke up to 3 km agl, then lidar signal saturated; high variability and situations when lidar sees less smoke at zenith than the sun photometer measuring across plumes passing in front of the sun; Airborne measurements by night from ER2

Date: 25 August 2019

Team: DM1 (Anthony/Ioana)

Location: 204 Cow Fire, OR

Accomplishment/Activity: mobile from Vale, OR to 204 Cow Fire and stationary lidar measurements by night at DP90 (inside smoke area)

Comments/Conditions: low AOD in the morning at Juntura (0.08 at 465 nm), starting to increase when reaching Vale (0.24 at 465 nm); by night, lidar beam completely attenuated at low altitudes due to very thick smoke. ER2 flying during the day

Date: 26 August 2019

Team: DM1 (Anthony/Ioana)

Location: John Day, OR

Accomplishment/Activity: mobile John Day, OR – 204 Cow Fire, mobile inside smoke area and DRAGON stationary points with Microtops/Calitoo (Ioana/Sacha/Brent). Lidar measurements by night at John Day, OR

Comments/Conditions: haze when going up on the mountain; thick smoke at low altitudes (< 2 km agl) attenuating the laser beam; high AOD (1.3-4.8 at 440 nm); coordinated AOD measurements with MODIS overpass

Date: 27 August 2019

Team: DM1 (Anthony/Ioana)

Location: Baker City, OR

Accomplishment/Activity: mobile John Day, OR – 204 Cow Fire (DM1 explores the W side of the fire, while DMU2 explores the E side of the fire, passing by the N side and going through Unity; meet at Helicopter point). Mobile inside smoke area and DRAGON stationary points with Microtops/Calitoo (Ioana/Sacha/Brent). In the evening, mobile from Unity, OR to Baker, OR and then stationary lidar data by night in Baker

Comments/Conditions: thin layer of smoke seen in lidar data, early morning in John Day; intercomparison of sun photometers in John Day in the morning; No smoke in the valley (Prairie City) in the morning (low AOD), but heavy smoke in the afternoon when descending from the mountains (smoke flooded the NW valley – Prairie City and E valley - Unity) (AOD of 1 at 440 nm, thick layer below 2 km agl); AOD quite stable (~ 1 at 440 nm) but smoke not homogeneous – less at zenith than in the sun direction; smoke is being pushed towards E as strong westerly winds start in the afternoon; AOD is less when reaching Austin, OR; when looking at the sky above lidar almost no smoke, but plume in the sun direction; head E to catch regional transport from 204 Cow Fire, seen from Unity to Baker

Date: 28 August 2019

Team: DM1 (Anthony/Ioana)

Location: MOSS, McCall, ID

Accomplishment/Activity: mobile from Baker, OR to McCall, ID and lidar measurements by night at MOSS

Comments/Conditions: thin smoke layers (<2 km agl) still seen along the road from Baker, transported from 204 Cow Fire until Council, ID; AOD ~ 0.2 at 440 nm

Date: 29 August 2019

Team: DM1 (Anthony/Ioana)

Location: MOSS, McCall, ID

Accomplishment/Activity: stationary lidar data by night at MOSS

Comments/Conditions: day off

Date: 30 August 2019

Team: DM1 (Anthony/Ioana)

Location: McCall, ID

Accomplishment/Activity: last measurements at Nethker Fire

Comments/Conditions: smoke almost gone; shallow haze, really localized and much less than before, only around intersection with road to Burgdorf; Measurements of PBL height for Nancy Johnston (Lewis Clark State College)

Date: 31 August 2019

Team: All

Location: Idaho

Accomplishment/Activity: no measurements

Comments/Conditions: day off

Date: 1 September 2019

Team: All

Location: MOSS, McCall, ID

Accomplishment/Activity: end of campaign

Comments/Conditions: packing instruments

Note:

During the whole FIREX campaign, high altitude layers were observed in the UTLS (14-18 km agl), by night, in clear sky conditions, at several locations explored by mobile measurements. These aerosol layers

might originate from the Raikoke volcanic eruption on 22 June 2019, sending volcanic ash and sulphuric compounds into the UTLS. These layers are also recurrently observed since end of June in the continuous lidar data at Lille, France and also seen by CALIOP.

Activity report FIREX – DM2

POC: David Giles, Anthony LaRosa, Philippe Goloub, Luc Blarel
Lilia Proniewski, Gael Dubois, Ioana Popovici, Thierry Podvin



Instruments	Details
PLASMA1/#650 Sun Photometer	340, 380, 440, 500, 675, 870, 937, 1020 and 1640 nm filters
PLASMA1/#950 Sun Photometer	380, 440, 500, 675, 870, 937, 1020 and 1640 nm filters
CIMEL CE370 LIDAR	532 nm channel
Tenum Calitoo Sun Photometer	465, 540 and 615 nm filters
AirBeam2 (HabitatMap ONG)	particle counter

Date: 23 July 2019

Team: DM2 (Philippe/Luc)

Location: MOSS, McCall, ID

Accomplishment/Activity: Prepare DMU1 SUV to set up CE376 lidar and Cimel ship photometer

Comments/Conditions: no smoke locally

Date: 24 July 2019

Team: DM2 (Philippe/Luc)

Location: MOSS, McCall, ID

Accomplishment/Activity: Prepare DMU1 SUV to set up CE376 lidar and Cimel ship photometer and calibrate compass of ship photometer and test during motion

Comments/Conditions: no smoke locally

Date: 25 July 2019

Team: DM2 (Philippe/Luc)

Location: MOSS, McCall, ID

Accomplishment/Activity: Prepare DM2 SUV to set up instruments
Comments/Conditions: no smoke locally

Date: 26 July 2019

Team: DM2 (Philippe/Luc)

Location: MOSS, McCall, ID

Accomplishment/Activity: CE370 lidar received and set up in DM2

Comments/Conditions: no smoke locally

Date: 27 July 2019

Team: DM2 (Philippe/Luc)

Location: Moscow, ID

Accomplishment/Activity: mobile McCall, ID to Moscow, ID. Lidar measurements by night at Moscow, ID

Comments/Conditions: profiling on the mountain, close to Lewiston (summit at 796 m)

Date: 28 July 2019

Team: DM2 (Philippe/Luc)

Location: MOSS, McCall, ID

Accomplishment/Activity: mobile Moscow, ID to McCall, ID and lidar measurements by night at MOSS

Comments/Conditions: cirrus clouds detected along a part of mobile transect (stop Plasma1); in data at 21:14 UTC pass through construction works (dust) – clean lidar and Plasma1 optics

Date: 29 July 2019

Team: DM2 (Philippe/Luc)

Location: Challis, ID

Accomplishment/Activity: mobile McCall, ID – Challis, ID

Comments/Conditions: check fiber connection on lidar telescope at MOSS; stop and restart lidar and Plasma1 sometimes on the road to Challis as clouds and rain move in; Philippe removes mosquitos from Plasma lens; no lidar by night

Date: 30 July 2019

Team: DM2 (Philippe/Luc)

Location: Hamilton, MT

Accomplishment/Activity: mobile Challis, ID – Hamilton, MT

Comments/Conditions: stop sometimes Plasma1 and lidar as clouds and storm move in; fine layer (aerosol/cloud) seen on the sky

Date: 31 July 2019

Team: DM2 (Philippe/Luc)

Location: MOSS, McCall, ID

Accomplishment/Activity: mobile Hamilton, MT to McCall, ID and lidar by night at MOSS

Comments/Conditions: go to McCall passing by the N, through Lolo, MT and Grangeville, ID; stop Plasma1 when temperature too high (49 ° C in the instrument)

Date: 1 August 2019

Team: All

Location: MOSS, McCall, ID

Accomplishment/Activity: lidar measurements by night at MOSS
Comments/Conditions: presentation of PHOTONS activity (Philippe Goloub) and writing of a technical and instrument check-up note for the 2 DRAGON Mobile Units

Date: 2 August 2019

Team: All
Location: MOSS, McCall, ID
Accomplishment/Activity: lidar measurements by night at MOSS
Comments/Conditions: day off

Date: 3 August 2019

Team: DM2 (Philippe/Luc)
Location: MOSS, McCall, ID
Accomplishment/Activity: mobile round-trip McCall to Boise with lidar, Plasma1 and GPS ON
Comments/Conditions: exchange of teams (Sacha and Gael arrive)

Date: 4 August 2019

Team: DM2 (Philippe/Luc/Gael/Sacha)
Location: MOSS, McCall, ID
Accomplishment/Activity: exchange of information concerning DM2
Comments/Conditions: no measurements

Date: 5 August 2019

Team: DM2 (Gael/Sacha)
Location: Fort Spokane, WA
Accomplishment/Activity: mobile at Fort Spokane (E of fire)
Comments/Conditions: William Flats Fire – impressive smoke (AOD>2 at 440 nm); W/NW winds; DC-8 and ER-2 flights; no measurements on the road from McCall to Fort Spokane as clean atmosphere conditions and in order to save power for the instruments when it's more interesting

Date: 6 August 2019

Team: DM2 (Gael/Sacha)
Location: Fort Spokane, WA
Accomplishment/Activity: mobile towards NE up to Bissel, following LARGE Mobile Lab then come back to camping at Fort Spokane
Comments/Conditions: William Flats Fire – stop between Hunters and Fruitland, measurements along with LARGE then go back to Hunters; stop Plasma1 when temperature too high, gap in lidar data due to connectivity problem; DC-8 and ER-2 flights;

Date: 7 August 2019

Team: DM2 (Gael/Sacha)
Location: Fort Spokane, WA
Accomplishment/Activity: mobile on the E side of the fire around Fort Spokane and lidar measurements by night inside smoke area (camping Fort Spokane)
Comments/Conditions: William Flats Fire - AOD at Hunters (0.4 at 465 nm); measurements around Kettle Falls, Chewelah; stop Plasma1 when sun is completely obscured by thick smoke (sun is orange/red); DC-8 flight (16 mi N of Reardan)

Date: 8 August 2019

Team: DM2 (Gael/Sacha)

Location: Spokane, WA

Accomplishment/Activity: mobile Fort Spokane – Spokane City, WA

Comments/Conditions: AOD 0.3 at 465 nm when starting measurements

Date: 9 August 2019

Team: DM2 (Gael/Sacha)

Location: MOSS, McCall, ID

Accomplishment/Activity: mobile Spokane, WA – Missoula, MT – McCall, ID but no measurements

Comments/Conditions: rain and clouds and problems with the instruments

Date: 10 August 2019

Team: DM2 (Gael/Sacha)

Location: McCall, ID

Accomplishment/Activity: stationary measurements at McCall Activity Barn

Comments/Conditions: stop lidar due to rain; Media Day

Date: 11 August 2019

Team: DM2 (Gael/Sacha)

Location: McCall, ID

Accomplishment/Activity: mobile inside and outside Nethker Fire

Comments/Conditions: low clouds (1-2 km agl) and intermittent rain; measurements during day (10 AM-4 PM LT); 1:25 PM LT Calitoo measurements next to AERONET site

Date: 12 August 2019

Team: DM2 (Gael/Sacha)

Location: McCall, ID

Accomplishment/Activity: mobile inside and outside Nethker Fire

Comments/Conditions: 19h UTC stationary measurements at MOSS (for comparison with MPL)

Date: 13 August 2019

Team: DM2 (Gael/Sacha)

Location: McCall, ID

Accomplishment/Activity: mobile inside and outside Nethker Fire (night/early morning/day)

Comments/Conditions: repair Plasma2 (adjust wheels); repair of Plasma1 at MOSS (broken wires inside due to rough roads)

Date: 14 August 2019

Team: DM2 (Gael/Sacha)

Location: McCall, ID

Accomplishment/Activity: mobile inside and outside Nethker Fire (night/early morning/day)

Comments/Conditions: 1:30 AM UTC – stationary measurements at MOSS (to compare with MPL)

Date: 15 August 2019

Team: DM2 (Gael/Sacha/Ioana)

Location: McCall, ID

Accomplishment/Activity: mobile inside and outside Nethker Fire (early morning/day)

Comments/Conditions: drive up on the mountain (Secesh) until seeing no contribution of smoke, low PM2.5 at surface level ($6 \mu\text{g}/\text{m}^3$) and lidar signal below 300 m agl completely disappeared; high PM2.5 in the smoke area ($\sim 200 \mu\text{g}/\text{m}^3$), smoke below 200 m agl, localized mainly along the main road, less at Dave point and at Burgdorf; smoke dissipates after sunrise, AOD 0.13 at 465 nm around 10 AM LT; slowly driving on the road to have stable Plasma measurements between tress and coincident Calitoo and Airbeam data

Date: 16 August 2019

Team: DM2 (Gael/Sacha/Ioana)

Location: McCall, ID

Accomplishment/Activity: mobile inside and outside Nethker Fire (early morning/day)

Comments/Conditions: smoke only localized around main burnt area; maximum AOD 0.24 measured around 10 AM LT in the smoke area, PM2.5 less than the day before ($\sim 150 \mu\text{g}/\text{m}^3$); start Plasma1 at Spike camp (AOD 0.14 at 465 nm), AOD around 0.14 also up to Secesh, Chinook and Dave point; layer at 3.2 km agl seen at MOSS, possibly transported smoke from other far-range fires

Date: 17 August 2019

Team: DM2 (Gael/Sacha/Ioana)

Location: McCall, ID

Accomplishment/Activity: mobile inside and outside Nethker Fire (early morning/day)

Comments/Conditions: less smoke than yesterday (PM2.5= $120 \mu\text{g}/\text{m}^3$); smoke below 200 m agl; take road to Chinook to explore extent of smoke, but low PM2.5 at surface level and same layer in altitude, below 300 m agl; up on the mountain we are out of the smoke plume, low PM2.5 ($5 \mu\text{g}/\text{m}^3$); smoke dissipating after sunrise, AOD ~ 0.1 at 465 nm

Date: 18 August 2019

Team: All

Location: Idaho

Accomplishment/Activity: no measurements

Comments/Conditions: day off

Date: 19 August 2019

Team: DM2 (Gael/Sacha)

Location: McCall, ID

Accomplishment/Activity: mobile inside and outside of Nethker Fire then back to MOSS

Comments/Conditions: last day of measurements at Nethker Fire; less smoke than before (PM2.5= $100 \mu\text{g}/\text{m}^3$); smoke below 200 m agl; up on the mountain (after Secesh) we are out of the smoke, low PM2.5 ($3 \mu\text{g}/\text{m}^3$); smoke dissipating after sunrise, AOD ~ 0.1 at 465 nm around 8 AM LT at Spike Camp

Date: 20 August 2019

Team: DM2 (Gael/Sacha)

Location: Joseph, OR

Accomplishment/Activity: mobile McCall, ID to Joseph, OR through south (Cambridge, Baker, La Grande). Lidar measurements by night at Joseph

Comments/Conditions: cirrus clouds on the road; restart Plasma after La Grande; smoke visible when reaching Joseph (Granite Gulch Fire - Wallowa-Whitman Mountains) (AOD 0.9 at 465 nm); smoke changes direction (NE)

Date: 21 August 2019

Team: DM2 (Gael/Sacha)

Location: Joseph, OR

Accomplishment/Activity: mobile from Joseph towards E then S into Wallowa Mountains, then N to Imnaha and back to Joseph

Comments/Conditions: Granite Gulch Fire - low AOD at Joseph (~0.17 at 465 nm); cirrus clouds along most of the mobile transect (max AOD ~ 0.2 measured along investigated routes); problems with Plasma1 due to rough roads, change with Plasma2

Date: 22 August 2019

Team: DM2 (Gael/Sacha)

Location: McCall, ID

Accomplishment/Activity: mobile Joseph-Halfway, OR then go back to MOSS, McCall

Comments/Conditions: low level clouds in the morning, sky clearing up in the afternoon; low AOD (~0.1 at 465 nm); repair Plasma1 at MOSS

Date: 23 August 2019

Team: DM2 (Gael/Sacha)

Location: McCall, ID

Accomplishment/Activity: mobile inside and outside Nethker Fire

Comments/Conditions: much less smoke than before; start Plasma at Burgdorf (AOD 0.07 at 465 nm); arrival of Thierry

Date: 24 August 2019

Team: DM2 (Thierry/Sacha)

Location: 204 Cow Fire, OR

Accomplishment/Activity: mobile Nethker Fire (6-10 AM LT) then mobile from McCall, ID to Unity, OR (12 AM - 5 PM LT), then mobile by night at the base of the mountains, SE of fire

Comments/Conditions: very low altitude layer at Nethker Fire, low haze in the morning, much less than before and a thin layer at 4-5 km agl, possibly coming from 204 Cow Fire;

204 Cow Fire in the afternoon; Plasma1 ON then Plasma2 during the mobile transect from McCall to 204 Cow Fire; meet DMU1 at Unity, try to cross an unpaved road on the SE side of the fire, at night, to arrive at Juntura but the road was bad and unknown ahead so decide to go to Juntura through Vale. Arrive at the hotel at 3:30 AM LT on 25 August; stop the lidar on the road back as we follow DMU1 so no point in having 2 lidars working in the same time

Date: 25 August 2019

Team: DM2 (Thierry/Sacha)

Location: John Day, OR

Accomplishment/Activity: mobile Vale, OR – 204 Cow Fire and lidar measurements by night in John Day, OR

Comments/Conditions: try to fix Plasma1 in Juntura but unsuccessfully; Plasma2 dirty lens after measurements on unpaved road, clean it; possibility to compare it with #1180 at a fixed position; At 204

Cow Fire, DRAGON stationary points (Sacha/Brent/Ioana), while Anthony (DMU1) and Thierry mobile along the road in opposite directions: Thierry towards S, Anthony towards N; Plasma measurements slowly or stop on the road so as to have as many AOD measurements between trees.

Date: 26 August 2019

Team: DM2 (Thierry/Sacha)

Location: John Day, OR

Accomplishment/Activity: mobile John Day, OR – 204 Cow Fire. Mobile inside smoke area and DRAGON stationary points with Microtops/Calitoo (Ioana/Sacha/Brent)

Comments/Conditions: 204 Cow Fire – DM2 slowly or stop on the road so as to have as many Plasma2 AOD measurements between trees; haze all over the region, AOD increasing gradually as we go up on the mountain and reach the fire area (1.14 at 465 nm), PM2.5 from particle counter also increases until saturation (250 $\mu\text{g}/\text{m}^3$); comparison of Plasma with Cimel when arriving at DP90; Thierry continues with mobile to the S until no more smoke (AOD 0.06 at 465 nm)

Date: 27 August 2019

Team: DM2 (Thierry/Sacha)

Location: Vale, OR

Accomplishment/Activity: mobile John Day, OR – 204 Cow Fire through Unity. Mobile inside smoke area, then mobile from Unity to Vale and stationary lidar data by night in Vale

Comments/Conditions: intercomparison of Plasma2 with CIMEL sun photometer and Microtops, Calitoo in John Day in the morning at the supermarket (AOD 0.09 at 465 nm); take road 26 by N side of fire, opposite to DMU1, then meet at Helicopter point around 11 AM LT (smoke haze is more homogeneous); then go to Prairie City (high AOD ~ 1) and go towards John Day until seeing less smoke contribution (AOD of 0.09 at 465 nm in John Day); in the evening, follow regional transport of smoke to the E (up to Vale)

Date: 28 August 2019

Team: DM2 (Thierry/Sacha)

Location: MOSS, McCall, ID

Accomplishment/Activity: mobile Vale, OR – McCall, ID. Lidar measurements by night at MOSS; try to replace the horizontal motor driver for Plasma1, but unsuccessfully

Comments/Conditions: smoke layer at 1.5 km agl seen along the mobile transect

Date: 29 August 2019

Team: DM2 (Thierry/Sacha)

Location: MOSS, McCall, ID

Accomplishment/Activity: comparison Plasma2 – Cimel #1180 sun photometer, intercalibration possible (AOD of 0.14 at 465 nm)

Comments/Conditions: -

Date: 30 August 2019

Team: DM2 (Thierry/Sacha)

Location: MOSS, McCall, ID

Accomplishment/Activity: stationary lidar data by night at MOSS

Comments/Conditions: thin layer seen at 1.5 km agl in the lidar data

Date: 31 August 2019

Team: All
Location: Idaho
Accomplishment/Activity: no measurements
Comments/Conditions: day off

Date: 1 September 2019

Team: All
Location: MOSS, McCall, ID
Accomplishment/Activity: end of campaign
Comments/Conditions: packing instruments

Note:

During the whole FIREX campaign, high altitude layers were observed in the UTLS (14-18 km agl), by night, in clear sky conditions, at several locations explored by mobile measurements. These aerosol layers might originate from the Raikoke volcanic eruption on 22 June 2019, sending volcanic ash and sulphuric compounds into the UTLS. These layers are also recurrently observed since end of June in the continuous lidar data at Lille, France and also seen by CALIOP.

FIREX-AQ and McCall DRAGON Activity Reports

POC: Brent Holben



Date: 20 Jul 2019

Team: Holben

Location: Transit to FIREX-AQ region

Accomplishment/Activity: Fly to Seatac, overnight Ellensburg, WA

Comments/Conditions: None

Date: 21 Jul 2019

Team: Holben

Location: Transit to McCall via Moscow/Meet Bochetti Accomplishment/Activity: UoI plans for retrievals from MODIS/Planet Dove?

Comments/Conditions: Settled into MOSS

Date: 22 Jul 2019

Team: Holben

Location: MOSS/Activity Barn

Accomplishment/Activity: Mini lidar established/Satcom unpacked/French arrive sans lidar/contacts for McCall DRAGON deployments

Date: 23 Jul 2019

Team: Holben/Sorokin

Location: McCall DRAGON

Accomplishment/Activity: Establish MD 4 (Burgdorf), MD6 (French Creek grade), MD7 (Riggins)

Date: 24 Jul 2019

Team: Holben/Sorokin

Location: McCall DRAGON

Accomplishment/Activity: Establish MD3 (Zims), MD5 (Warren),

Date: 25 Jul 2019

Team: Holben/Sorokin

Location: McCall DRAGON

Accomplishment/Activity: Establish Mt No Business/DM1 functional deploy to Stanley

Comments/Conditions: no local smoke/cldy

Date: 26 Jul 2019

Team: Holben/Sorokin

Location: MOSS

Accomplishment/Activity: Maintain McCall DRAGON downloads/ French Delivery of lidar/Relocate SatCom to activity barn

Date: 27 Jul 2019

Team: Holben/Sorokin

Location: MOSS/McCall/Lewiston/Moscow

Accomplishment/Activity:

Comments/Conditions: Sat com non-functional/frustrating DM1 E. W/DM2 to Moscow/Tube measurements with N. Johnston's team./Windy, clean/

Date: 28 Jul 2019

Team: Holben

Location: MOSS/McCall

Accomplishment/Activity: DM1 to Moscow/Lewiston

Comments/Conditions: Shakedown to Moscow, ID meet DM1, ship obs poor tracking, plasma good/lidars uncertain, Downloaded MD1 sites—no issues.

Date: 29 Jul 2019

Team: Holben/Sorokin

Location: N. Id to McCall/Lewiston/

Accomplishment/Activity: Download McCall DRAGON

Comments/Conditions: sunny and clean

Date: 30 Jul 2019

Team: Holben/Sorokin

Location: MOSS to Boise

Accomplishment/Activity: Sorokin home/Holben attend Science Team Meeting/return to MOSS

Comments/Conditions: Sunny/Hot

Date: 31 Jul 2019

Team: Holben

Location: MOSS

Accomplishment/Activity: Maintain McCall DRAGON

Comments/Conditions: Sunny no smoke/DM2 down for maintenance

Date: 1 Aug 2019

Team: Holben

Location: MOSS

Accomplishment/Activity: Maintain McCall DRAGON, DM1-- Dave for Anthony, DM2—Sasha and Gael for Philippe and Luc/Holben transit to Seattle drive by Pipeline fire near Pasco good plume

Comments/Conditions:

Date: 2-7 Aug 2019

Team: Will Wyguet

Location: McCall

Accomplishment/Activity: Downloaded/maintained MD4, 5 & 6

Comments/Conditions: Nethker fire ignited

Date: 8 Aug 2019

Team: Holben

Location: Region

Accomplishment/Activity: Transit Seattle to McCall, DM1-- Dave for Anthony, DM2—Sasha and Gael for Philippe and Luc

Comments/Conditions:

Date: 9 Aug 2019

Team: Holben

Location: MOSS

Accomplishment/Activity: Prepare for Ground Media Day/SatCom marginally working

Comments/Conditions: prtly cldy/overnight rain/DM2 arrived late due to US 95 floods and road closure

Date: 10 Aug 2019

Team: Holben

Location: MOSS/Activity Barn

Accomplishment/Activity: Media Day,

Comments/Conditions: Heavy Rain, cold, poor public turnout

Date: 11 Aug 2019

Team: Holben

Location: MOSS/Nethkar Fire

Accomplishment/Activity: Mapping smoke from Nethkar fire from before sunrise thru Day and night with lidars

Comments/Conditions: Cldy little AOD,

Date: 12 Aug 2019

Team: Holben

Location: MOSS/Nethkar Fire

Accomplishment/Activity: Mapping smoke from Nethkar fire from before sunrise thru Day and night with lidars, Dense fog visibility 2 m am, fog dissipate by 10:30 am, leaving only dense uniform smoke, ship almucantar failed at spike camp, continued mapping w/lidars.

Comments/Conditions: Foggy am to prtly cldy day AOD; Long hours DM1 and 2 tag teams. Note extensive down stream smoke drainage in Seseach Valley

Date: 13 Aug 2019

Team: Holben

Location: MOSS/Nethkar Fire

Accomplishment/Activity: Day/Night Mapping smoke from Nethkar fire with lidars/ AOD use handhelds extensively with Mobile DRAGONS

Comments/Conditions: Significant AOD w/clearing skies, smoke am pools in valley, establish MD8 (Polar instrument) in drainage valley (Point David), ice forming on cimels am

Date: 14 Aug 2019

Team: Holben

Location: MOSS/Nethkar Fire

Accomplishment/Activity: Mapping smoke from Nethkar fire from before sunrise thru Day and night with lidars, establish MD9 (converted from ship cimel) on 100 m hill above 'Point David'

Comments/Conditions: mostly clear/smoke establish

Date: 15 Aug 2019

Team: Holben

Location: MOSS/Nethkar Fire

Accomplishment/Activity: Mapping smoke from Nethkar fire from before sunrise thru Day and night with lidars/Day night stationary lidar at MD8 (Point David), Maintain sites in network

Comments/Conditions: clearing conditions, valley smoke dissipate by 10:30 am

Date: 16 Aug 2019

Team: Holben

Location: MOSS/Nethkar Fire

Accomplishment/Activity: Mapping smoke from Nethkar fire from before sunrise thru Day and night with lidars/Day night stationary lidar at MD8 (Point David), Maintain sites in network

Comments/Conditions: clearing conditions, valley smoke dissipate by 10:30 am

Date: 17 Aug 2019

Team: Holben

Location: MOSS/Nethkar Fire

Accomplishment/Activity: Mapping smoke from Nethkar fire from before sunrise thru Day and night with lidars/Day night stationary lidar at MD8 (Point David), Maintain sites in network

Comments/Conditions: clearing conditions, valley smoke dissipate by 10:30 am

Date: 18 Aug 2019

Team: Holben

Location: MOSS/Nethkar Fire/Busman's holiday to Seven Devils

Accomplishment/Activity: Mapping smoke from Nethkar fire from before sunrise to morning, Maintain sites in network, team download and handhelds to French Creek, Riggins and Heavens Gate Lookout

Comments/Conditions: clearing conditions, valley smoke dissipate by 10:30 am smoke moved up Burgdorf valley and down Sesech Valley, Riggins clean heavy smoke fresh plume observed to Heavens Gate lookout from Granite Gulch fire, AOD ~ 0.8 at 500 nm, numerous handheld obs, FS AWS contact info and site Sesech Stage Coach weather station (contact Nate)

Date: 19 Aug 2019

Team: Holben

Location: MOSS/Nethkar Fire/

Accomplishment/Activity: Mapping smoke from Nethkar fire from before sunrise thru Day and night with lidars/Day night stationary lidar at MD8 (Point David), Maintain sites in network, MD9 converted back to shipmode

Comments/Conditions: clearing conditions, valley smoke dissipate by 10:30 am. Note mobile labs to UT and AZ, DRAGONS to Granite Gulch Fire, note additional weather stations

Date: 20 Aug 2019

Team: Holben

Location: MOSS/Nethkar Fire/Granite Gulch Fire

Accomplishment/Activity: Download McCall Dragon sites, afternoon transect to Granite Gulch Fire via Lewiston,

Comments/Conditions: Thin Ci 60% am valley smoke dissipate by 10:30 am, note smoke breaching Sesech Summit for first time. Arrive Joseph late afternoon.

Date: 21 Aug 2019

Team: Holben

Location: Joseph, OR Granite Gulch Fire

Accomplishment/Activity: Download McCall Dragon sites, afternoon transect to Granite Gulch Fire via Lewiston,

Comments/Conditions: Regional haze but no defined plumes.

Date: 22 Aug 2019

Team: Holben

Location: Joseph, OR /Granite Gulch Fire

Accomplishment/Activity: Download McCall Dragon sites, afternoon transect to Granite Gulch Fire via Lewiston,

Comments/Conditions: Am little smoke, searching for smoke to Halfway via east side of Wallowa Mts., no luck, Return to McCall via Oxbow Dam/Cascade. DM 1 continue DM2 change staff (Thierry for Gael).

Date: 23 Aug 2019

Team: Holben

Location: MOSS/Nethkar Fire/

Accomplishment/Activity: Maintain sites in network, Visit Cary Dome note FS AWS

Comments/Conditions:

Date: 24 Aug 2019

Team: Holben

Location: MOSS/Nethkar Fire/204 Cow Fire

Accomplishment/Activity: DM2 Mapping smoke from Nethkar fire from before sunrise thru late morning/dense lowlevel smoke a Brgdf Junction thin smoke at Point David, Maintain sites in network,

Comments/Conditions: Low level less than 150m inversion limits of detection w/lidar, DM2 to 204 Cow

Date: 25 Aug 2019

Team: Holben

Location: 204 Cow Fire transit/John Day, OR

Accomplishment/Activity: Transit to 204 Cow, Microtops

Comments/Conditions: Low AOD during transit, active plume, smoke all levels penetrate plume variable AOD

Date: 26 Aug 2019

Team: Holben

Location: 204 Cow Fire/John Day, OR

Accomplishment/Activity: Handheld fixed DRAGON sites ~ 8am to 5 pm, AOD 0.6 to 7. thru active plume. , superb plume characterization, hybrids at heliport

Comments/Conditions: Low AOD active plume, smoke all levels penetrate plume variable AOD

Date: 27 Aug 2019

Team: Holben

Location: 204 Cow Fire /John Day, OR/transit to McCall

Accomplishment/Activity: Mobile DRAGON transects south MD1 and N route MD2 converge at heliport, staggered transects afternoon to Prairie City/Unity, Holben to explore rough road N of fire/Table Lookout. Good photos of fire. Holben transect to McCall following plume 70 km East w/ microtops obs. MD1 to LeGrand and MD2 to Vale.

Comments/Conditions: Regional Hz settling out E, S and W then later transported N. Active fire plumes rising vertically thru multi day old haze. Weak steering winds. Noted plume spread to Weiser by 10 pm.

Date: 28 Aug 2019

Team: Holben

Location: MOSS/McCall Nethker Fires

Accomplishment/Activity: Maintained McCall DRAGON/downloaded data as needed; DM1 and 2 returned to MOSS.

Comments/Conditions: An inversion persists in Sesech Valley and overtopped Sesech Summit

Date: 29 Aug 2019

Team: Holben

Location: McCall DRAGON

Accomplishment/Activity: Transport of 204 Cow smoke transport over all three DRAGONS, MD1 and handheld measurements between fixed McCall DRAGON sites.

Comments/Conditions: late afternoon transport highly variable AOD thru plumes, possible good case study for mountain validation. Measurements at Brundage Mtn. Aerodyne and LARGE decommissioned.

Date: 30 Aug 2019

Team: Holben

Location: McCall Dragon

Accomplishment/Activity: AM Tube measurements at Burgdorf Junction and Point David w/ PM 2.5 and lidar. Breakfast /lunch at spike camp. Visit Crystal Mtn AWS, Cary Dome AWS

Comments/Conditions: Shallow inversion AM, transit to Riggins/rafting/Download MD 6 and 4.

Date: 31 Aug 2019

Team: Holben

Location: McCall

Accomplishment/Activity: Decommission sites MD1 and McCall, Pack DRAGON Mobile 1 and 2.

Date: 1 Sept 2019

Team: Holben

Location: Elk Summit loop to McCall

Accomplishment/Activity: Tube and handheld sample taken at 6:30 am Nethker, Elk Summit

Comments/Conditions: Active fire N some haze in S. Folk Canyon noted. Tube measurements.

Date: 2 Sept 2019

Team: Holben

Location: Elk Summit loop to McCall

Accomplishment/Activity: Tube and handheld sample taken at Big Creek Summit, Yellow Pine and Lick Creek Summit. Packed SatCom system and MD3. Cascade to be packed and shipped by Arnold Aviation.

Comments/Conditions: Cld free conditions low AOD all sites.

Date: 3 Sept 2019

Team: Holben

Location: Elk Summit loop to McCall

Accomplishment/Activity: Packed MD4, MD5, MD6, MD8

Comments/Conditions:

Date: 4 Sept 2019

Team: Holben

Location: MOSS/Transit to Lewiston

Accomplishment/Activity: Staged shipping/labels for Lidars, AERONET equipment, SatCom coordinated with MOSS. Set up tube measurements at Activity Barn, Pack Riggins, evening smoke S. of Lucile take tube measurements. Smoke to Craigmont. Deliver Tubes to N. Johnston (LCSC).

Comments/Conditions: Significant canyon smoke transport only partially captured by MD7 and Taylor Ranch TWRS.

Date: 5 Sept 2019

Team: Holben

Location: Rimrock to Moscow to Seattle

Accomplishment/Activity: Replaced Rimrock Robot, Met with Boschetti/Andy Hodack, wrap up UoI FS TR activities

Comments/Conditions: AERONET FIREX-AQ field campaign ends

Taylor Ranch DRAGON activity Report

POC: Tom Eck, Joel Schafer, Peter Gag



Date: 07 August 2019

Team: Taylor Ranch DRAGON (Tom)

Location: Taylor Ranch DRAGON

Accomplishment/Activity: 1 pm arrival at Taylor Ranch - Pete said too late to visit Cliff Creek Trail sites

Comments/Conditions: AOD(500)=0.08 AE(440-870)=1.61 Daily Av at Taylor_Ranch_TWRS
L1.5V data all dates

Date: 08 August 2019

Team: Taylor Ranch DRAGON (Tom)

Location: Taylor Ranch DRAGON

Accomplishment/Activity: Data download Cliff_Creek sites 1-3

Comments/Conditions: Nearly overcast all day; AOD(500)=0.13 AE(440-870)=1.32 (only 1 obs in cloud hole)

Date: 09 August 2019

Team: Taylor Ranch DRAGON (Tom)

Location: Taylor Ranch DRAGON

Accomplishment/Activity: Mid-day Thunderstorms limited Cliff Creek Trail activity

Comments/Conditions: AOD(500)=0.12 AE(440-870)=1.65 Daily Ave at Taylor_Ranch_TWRS

Date: 10 August 2019

Team: Taylor Ranch DRAGON (Tom)

Location: Taylor Ranch DRAGON

Accomplishment/Activity: Data download Cliff_Creek sites 1-3 early – Thunderstorm mid-day

Comments/Conditions: AOD(500)=0.12 AE(440-870)=1.63 Daily Ave at Taylor_Ranch_TWRS

Date: 11 August 2019

Team: Taylor Ranch DRAGON (Tom)

Location: Taylor Ranch DRAGON

Accomplishment/Activity: Mid-day Thunderstorms limited Cliff Creek Trail activity

Comments/Conditions: AOD(500)=0.18 AE(440-870)=1.50 Daily Ave at Taylor_Ranch_TWRS

Date: 12 August 2019

Team: Taylor Ranch DRAGON (Tom)

Location: Taylor Ranch DRAGON

Accomplishment/Activity: Data download Cliff_Creek sites 1-3, visited sites 4 and 5.

Comments/Conditions: AOD(500)=0.08 AE(440-870)=1.71 Daily Ave at Taylor_Ranch_TWRS

Date: 13 August 2019

Team: Taylor Ranch DRAGON (Joel)

Location: Taylor Ranch DRAGON

Accomplishment/Activity: Data download Cliff_Creek sites 1-3, disconnected wet sensors for Cliff_Creek sites 1-6

Comments/Conditions: No perceptible smoke.

Date: 14 August 2019

Team: Taylor Ranch DRAGON (Joel)

Location: Taylor Ranch DRAGON

Accomplishment/Activity: Data download Cliff_Creek sites 1-3.

Comments/Conditions: No perceptible smoke.

Date: 15 August 2019

Team: Taylor Ranch DRAGON (Joel)

Location: Taylor Ranch DRAGON

Accomplishment/Activity: Data download Cliff_Creek sites 1-3.

Comments/Conditions: No perceptible smoke.

Date: 16 August 2019

Team: Taylor Ranch DRAGON (Joel)

Location: Taylor Ranch DRAGON

Accomplishment/Activity: Data download Cliff_Creek sites 1-3.

Comments/Conditions: Faint signs of smoke haze apparent in early afternoon.

Date: 17 August 2019

Team: Taylor Ranch DRAGON (Joel)

Location: Taylor Ranch DRAGON

Accomplishment/Activity: Data download Cliff_Creek sites 1-3.

Comments/Conditions: No perceptible smoke.

Date: 18 August 2019

Team: Taylor Ranch DRAGON (Joel)
Location: Taylor Ranch DRAGON
Accomplishment/Activity: Data download Cliff_Creek sites 1-3.
Comments/Conditions: No perceptible smoke.

Date: 19 August 2019

Team: Taylor Ranch DRAGON (Joel)
Location: Taylor Ranch DRAGON
Accomplishment/Activity: Data download Cliff_Creek sites 1-3.
Comments/Conditions: No perceptible smoke.

Date: 20 August 2019

Team: Taylor Ranch DRAGON (Joel)
Location: Taylor Ranch DRAGON
Accomplishment/Activity: Data download Cliff_Creek sites 1-3. Wet sensors re-installed on Cliff Creek sites 4-6. Cliff Creek site 6 sensor head cable was untangled.
Comments/Conditions: No perceptible smoke.

TWRS Dragon on site Activity (Peter Gag)

Tuesday June 11th

Hiked up to mark all locations for packer. Flagged out site number 6, since it was the most difficult to find.

Wednesday June 19th

Helped packer load and ready equipment for packing.

Thursday June 20th

Helped packer load and ready equipment for packing.

Monday June 24th

Walked up with Mikhail to help set up site 1.

Tuesday June 25th

Helped Mikhail set up sites 2 and 3.

Wednesday June 26th

Walked up late to meet Mikhail as he was installing sites 4, 5, and 6.

Thursday July 4th

Went up to replace robot motor cover with chewed wire. Downloaded all sites but number 6.

Tuesday July 18th

Walked up to check and download instruments (all sites).

Friday July 26th?

Returned from a hike and found site 3 dumped by a bear. Reinstalled. Had no tools, so I leveled with my water bottle.

Sunday July 30th

Walked up to check and download instruments (all sites).

Wednesday August 28th

Walked up to check and download instruments (sites 1, 2, and 3).

Thursday September 12th

Dismantled sites 1 and 2, carried site 2 down to TWRS.

Tuesday September 17th

Dismantled site 5 and prepared for removal. Left in location.

Wednesday September 18th

Dismantled and prepared sites 6, 4, and 3 for removal. Hauled Site 6 to Site 5 for even stock load. Hauled site 4 and 3 down to an easier place to tie up and load stock.

Thursday September 19th

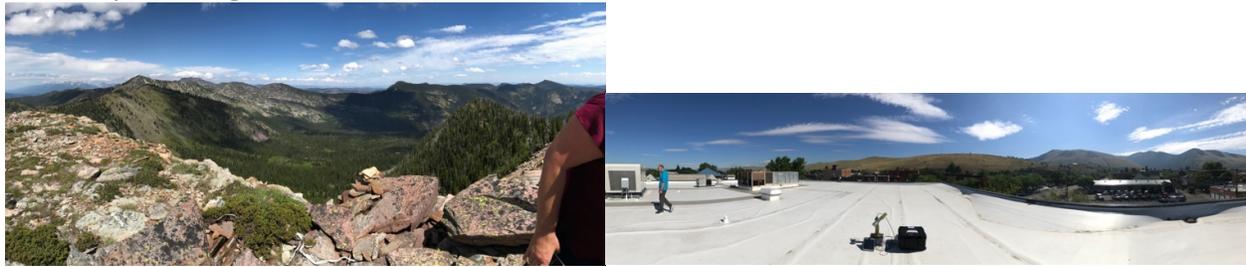
Planned retrieval of site number 1 to bring down to TWRS.

Monday September 23rd

Scheduled retrieval of sites 5 and 6, as well as, sites 4 and 3 by the local outfitter. Remaining sites will be packed down to TWRS.

Missoula DRAGON Activity Report

POC: Bryce Nordgren



Date:	July 9, 2019
Team:	Missoula DRAGON
Location:	Missoula Midslope
Accomplishment/Activity:	Finished site prep (weed-whacking the tall grass) and set up CIMEL #1184 at the midslope site. Did not have instructions to complete the GSM/FTP test. Took deployment photos. Emailed Jason Kraft and Tom Eck to check out the new deployment to see if it was uploading data.

Date:	July 10, 2019
Team:	Missoula DRAGON
Location:	Waterworks hill
Accomplishment/Activity:	Set up CIMEL #1183 at the waterworks hill site. The GSM and FTP tests indicated that the automatic data upload was not working. Took deployment photos. Notes regarding the rooftop on which the instrument was deployed: “All four corners of that building have antennas of various sorts, and all antennas are taller than the sunphotometer. We deployed as close to the south edge of the roof as we could, but I would expect the solar path may be obstructed in the early morning or late evening. Almu canters may possess problematic data points as well, although they should always be in the same location. Most of the direct sun measurements during the day should be good though.”

Date:	July 11, 2019
Team:	Missoula DRAGON
Location:	Missoula Midslope
Accomplishment/Activity:	Received reports that the automatic data upload was not working. Suggestion was to update to new version of firmware on the CIMEL. Updated the firmware on CIMEL #1184. Indications on console are that the automatic upload is now working, when we set the method to 3G in the menu.

Date:	July 11, 2019
Team:	Missoula DRAGON
Location:	Missoula Point Six
Accomplishment/Activity:	Updated the firmware on CIMEL #1185 and set up the instrument at the Point 6 mountaintop site. FTP test failed for all GSM mode settings (auto/2G/3G). Took deployment photos. Emailed Jason and Tom for advice.

Date:	July 12, 2019
Team:	Missoula DRAGON
Location:	Missoula public health
Accomplishment/Activity:	Updated firmware on and deployed CIMEL #1182. FTP test succeeded. Took deployment photos.

Date:	July 12, 2019
Team:	Missoula DRAGON
Location:	Missoula Point Six
Accomplishment/Activity:	Re-flashed firmware twice in effort to get automatic uploads working. Unsuccessful. Re-aligned sensor head to be flush with claw, then repeated solar alignment. Emailed status to Jason and Tom. Crack detected in the GSM antenna from one of the photos taken this day.

Date:	July 12, 2019
Team:	Missoula DRAGON
Location:	Missoula Midslope
Accomplishment/Activity:	Fixed sensor head alignment to be flush with claw and reduced the size of the cable loop. Repeated solar alignment.

Date:	July 18, 2019
Team:	Missoula DRAGON
Location:	Missoula Firelab Long term site
Accomplishment/Activity:	Updated firmware to 2.1.4 to resolve data transfer delays.

Date:	July 24, 2019
Team:	Missoula DRAGON
Location:	Missoula Point Six
Accomplishment/Activity:	Installed external GSM antenna at site to try and resolve automatic upload problems. FTP test never returned successful. Debugged problem with Dave Giles on phone, who noticed that the SIM card was connecting to a cell tower in Huson, MT (without transferring any data). "Wait and see" was the verdict.

Date:	July 24, 2019
Team:	Missoula DRAGON
Location:	Missoula Midslope
Accomplishment/Activity:	Reseated solar panel connector to try and resolve observed low battery condition. Measurements screen reported 12.3V and 250mA, which Jason confirmed to be in the correct range.

Date:	July 25, 2019
Team:	Missoula DRAGON
Location:	Missoula Midslope
Accomplishment/Activity:	Replaced external CIMEL battery with a full one. Tightened connection to wires in the solar panel connector.

Date:	July 29, 2019
Team:	Missoula DRAGON
Location:	Missoula Midslope
Accomplishment/Activity:	Replaced solar panel and interface box, and swapped out battery with full one.

Date:	August 19, 2019
Team:	Missoula DRAGON
Location:	Missoula Waterworks Hill
Accomplishment/Activity:	Downloaded data and emailed to Jason and Tom. Performed firmware upgrade. FTP test succeeded.