Ground-based smoke and plume observations from RxCADRE 2012

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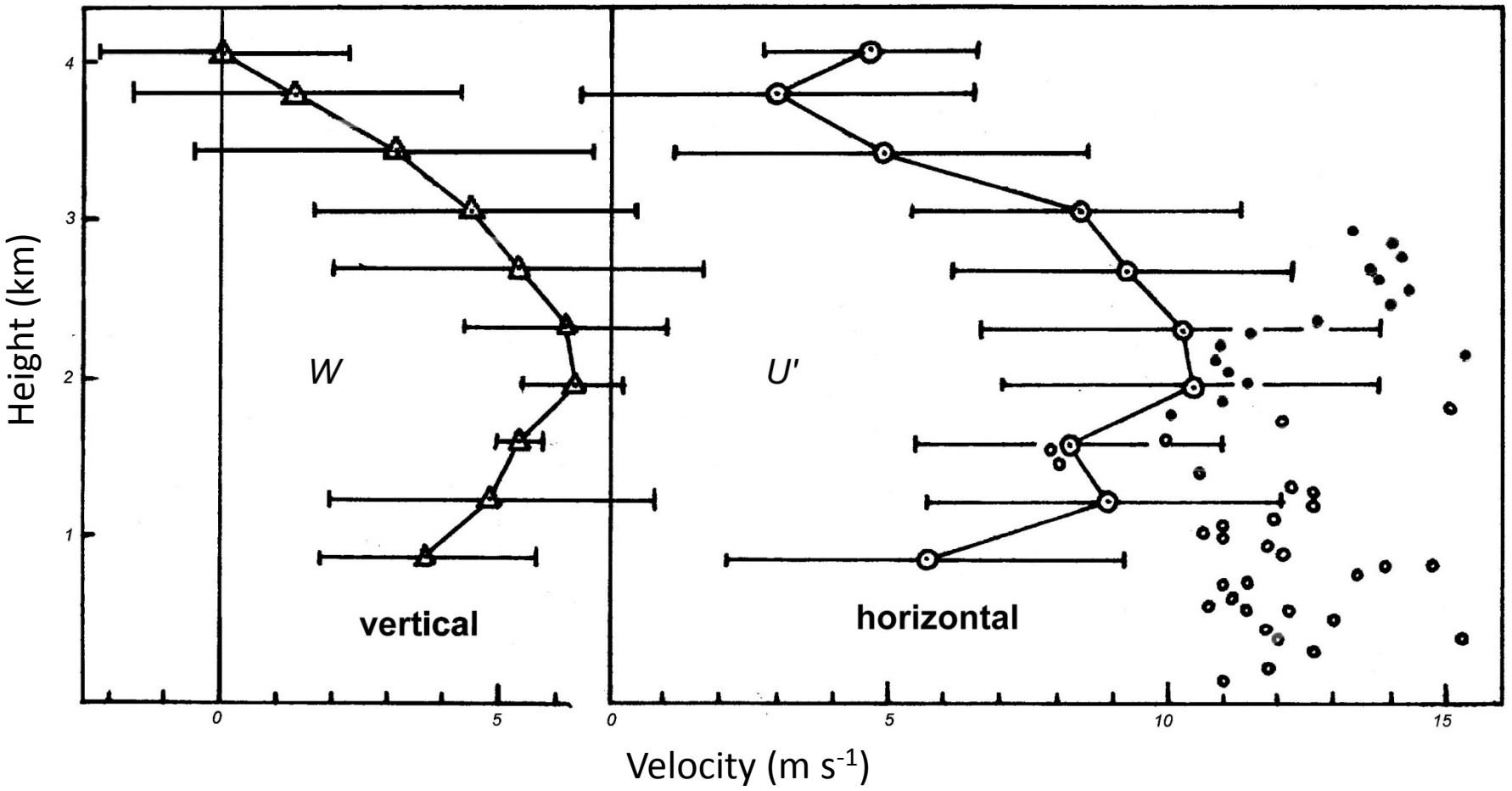
Goals

- Surface-based smoke measurements
- Time lapse and video (visible) images for plume movement reconstruction
- Repeat the success of Reid and Vines (1972) in constructing in-plume airspeeds.



(From Reid and Vines, 1972)

Equipment

- 3 Canon EOS-5D Mark 3’s with GPS
- 2 Canon EOS-7D’s
- 5 Canon HFR300 video cameras

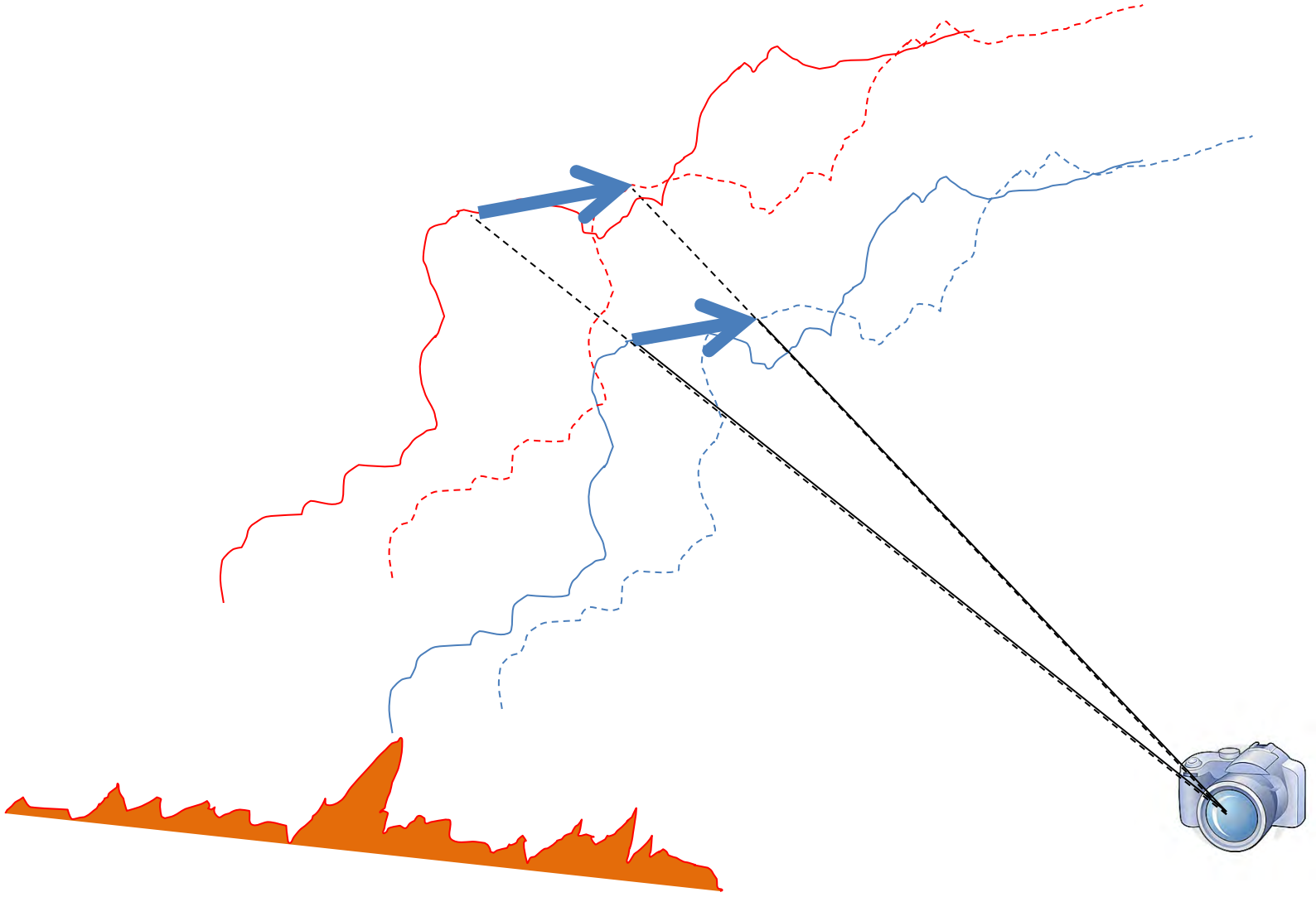
Deployment

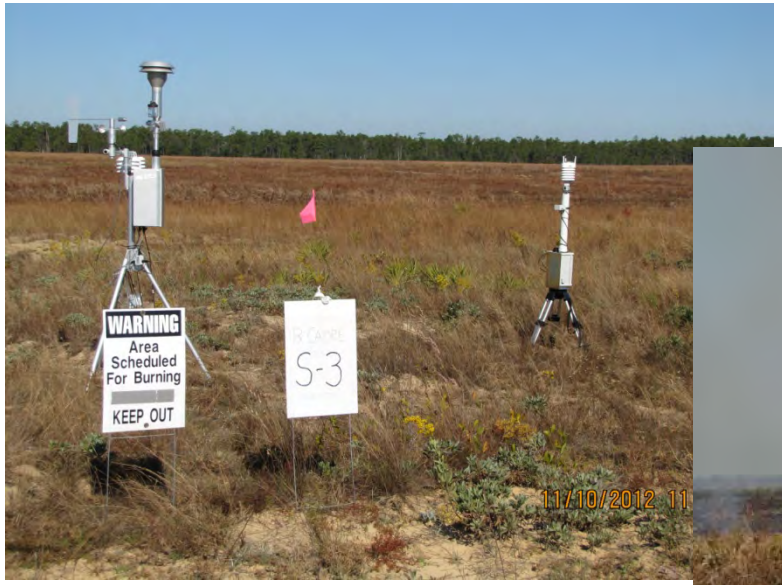
- Specific locations based on burn unit and weather conditions
- Several close-in cameras, at least one remote camera
- Still and video cameras co-located on tripods


CA1-L2F
CA4-L2G
CA3-L2G
CA2-L2G
CA5-L2G

Sample pictures

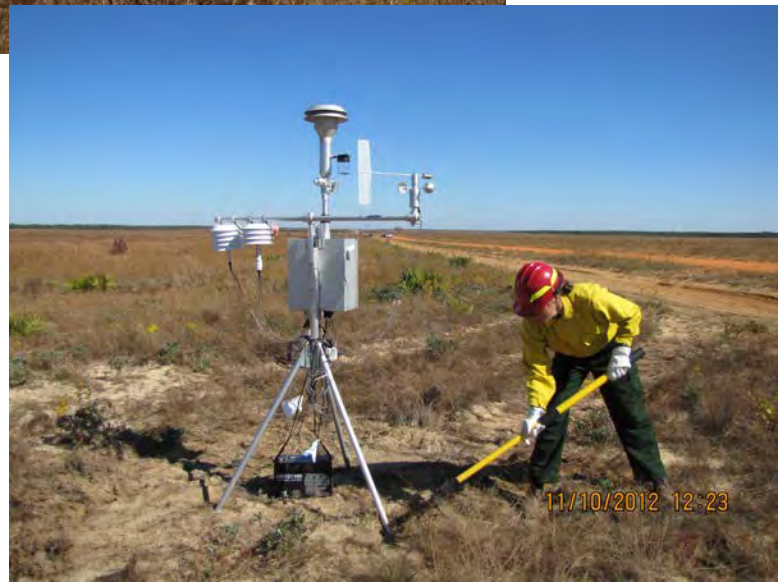
The challenge of depth

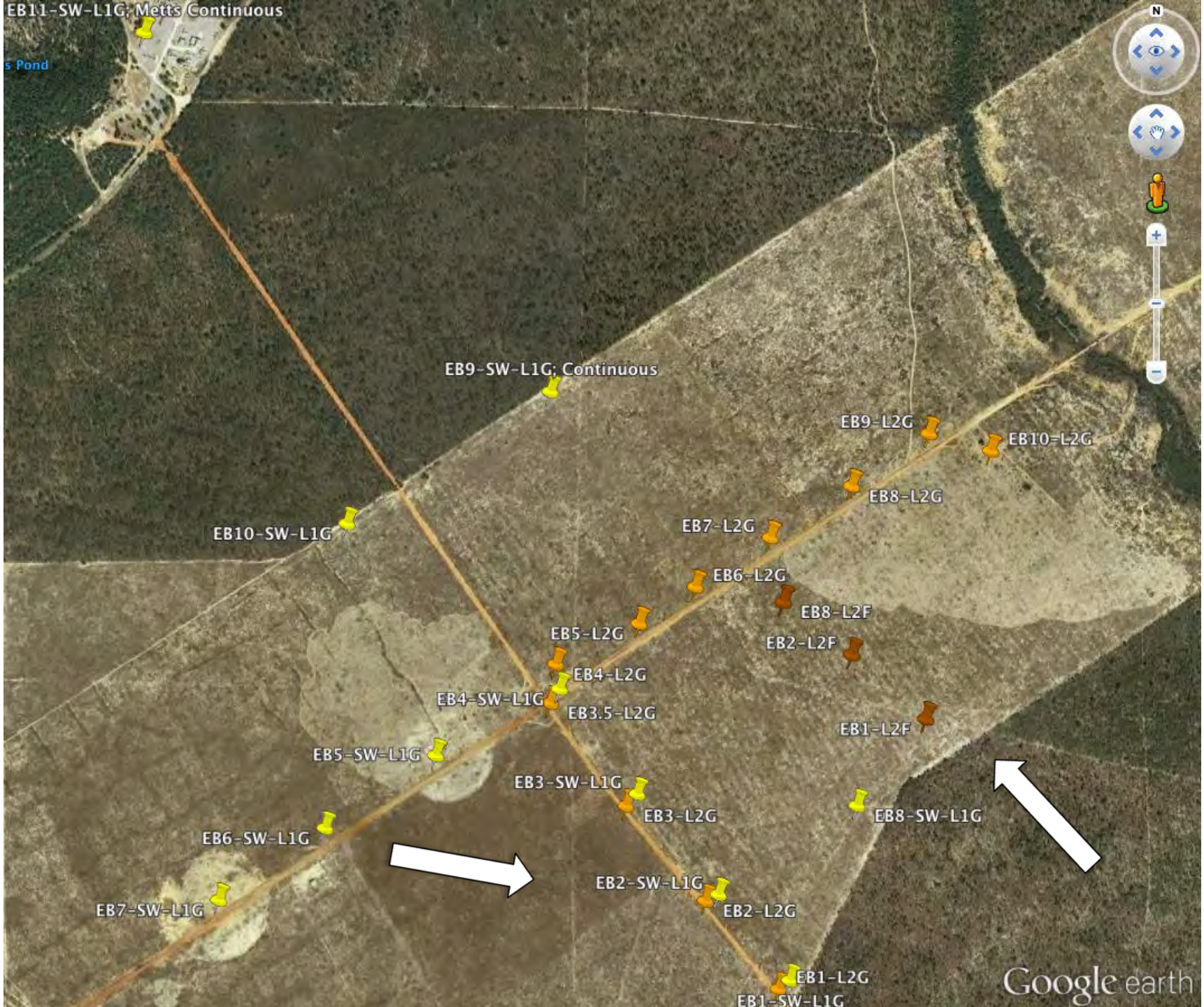


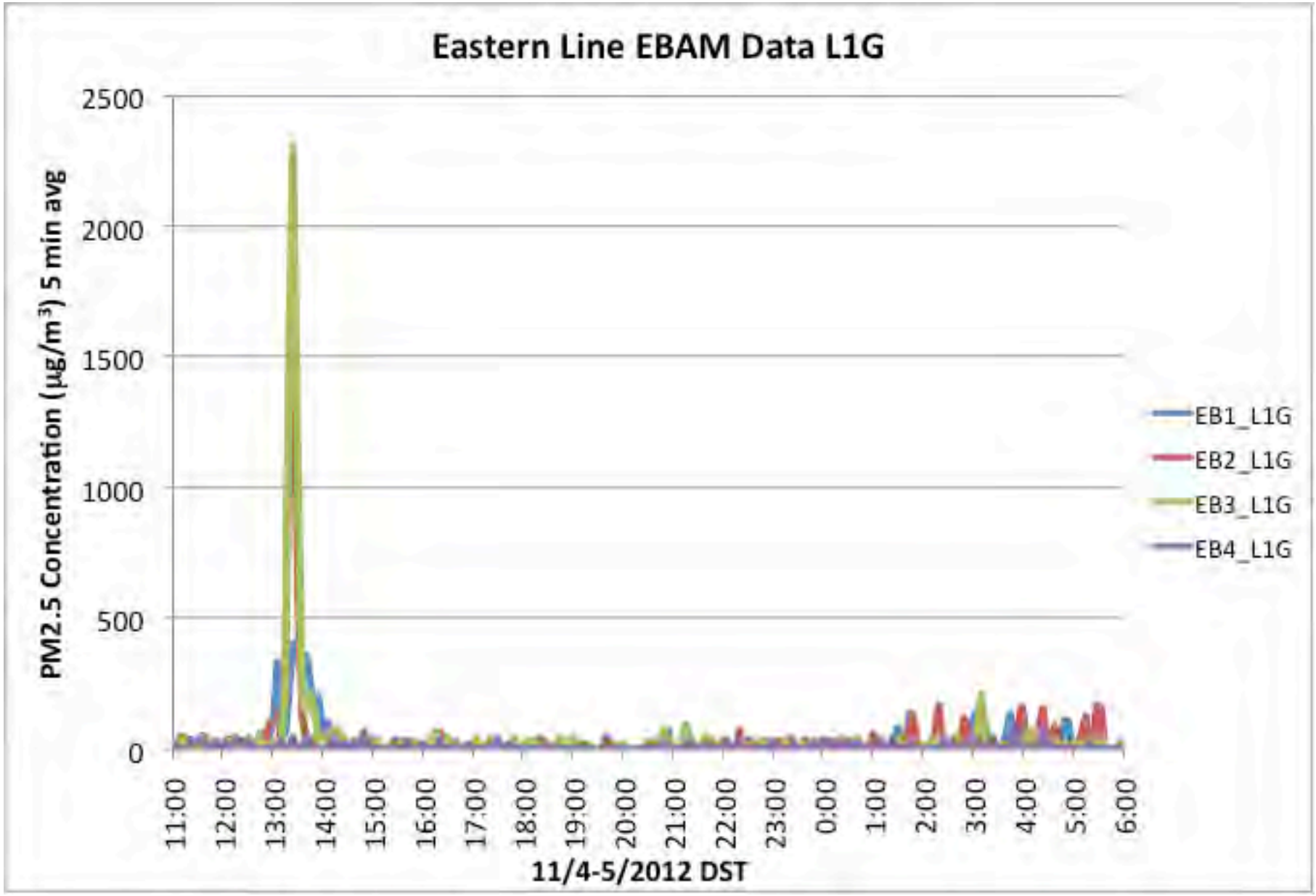


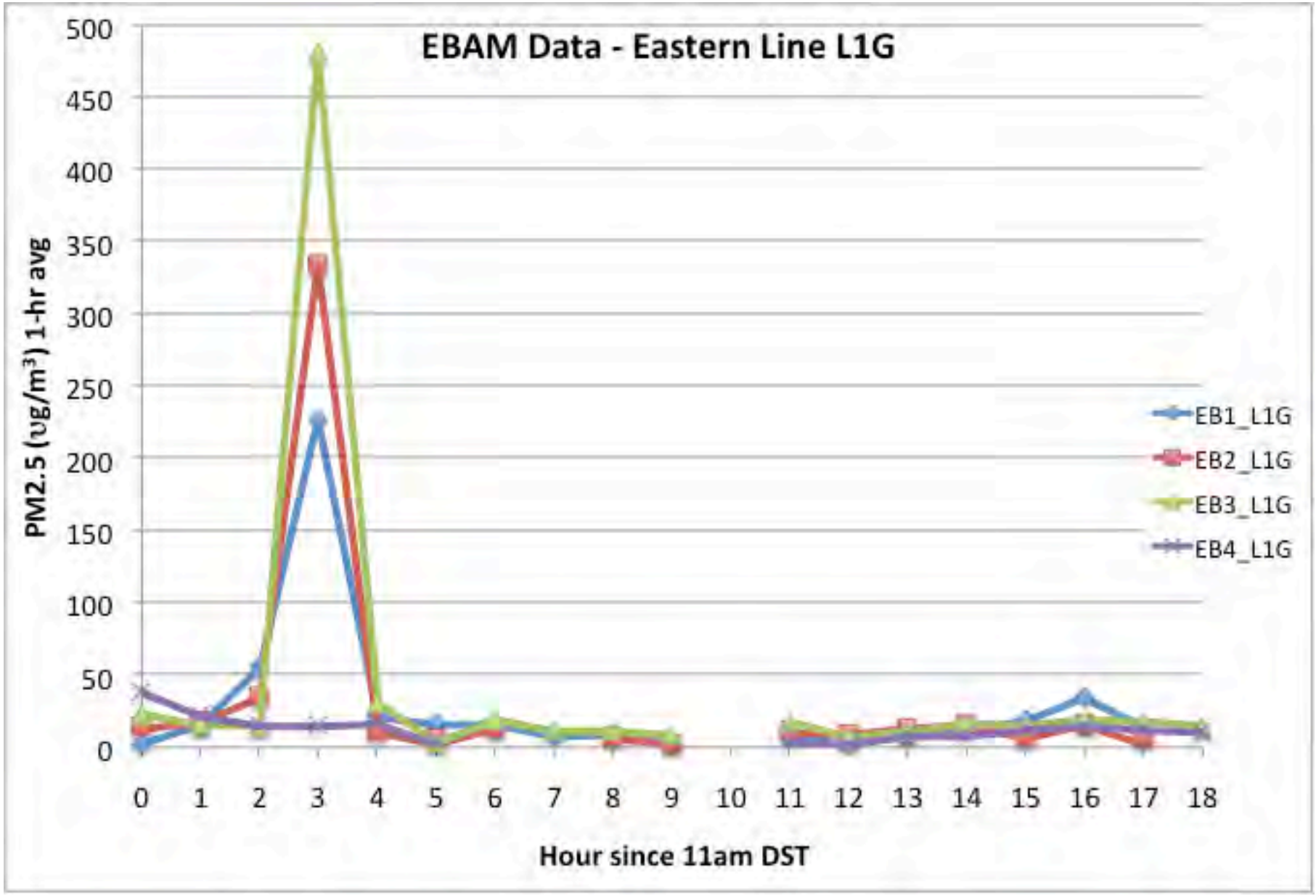
RxCADRE EBAM Data Preliminary Analysis

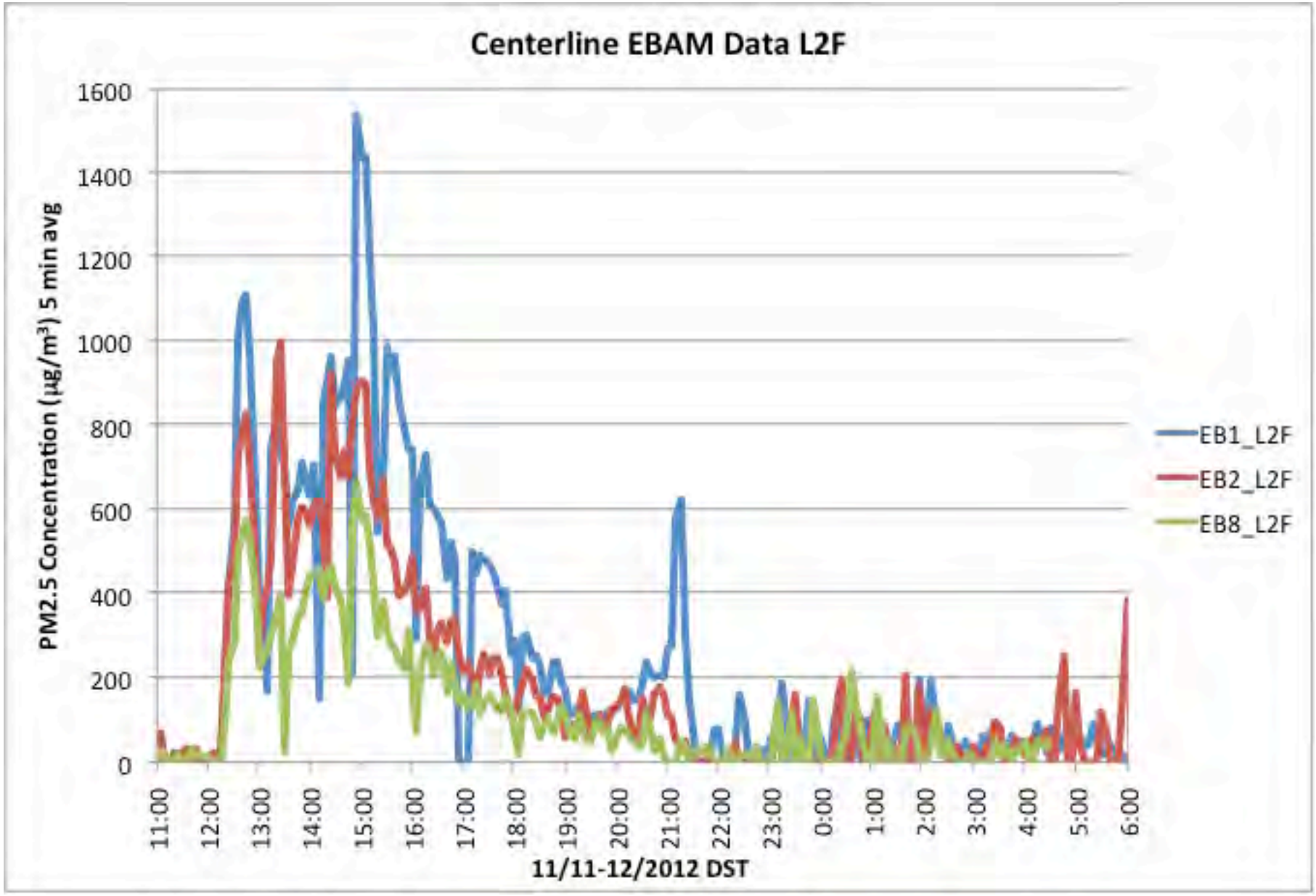
AirFire Team, USDA Forest Service
Scion Research, New Zealand

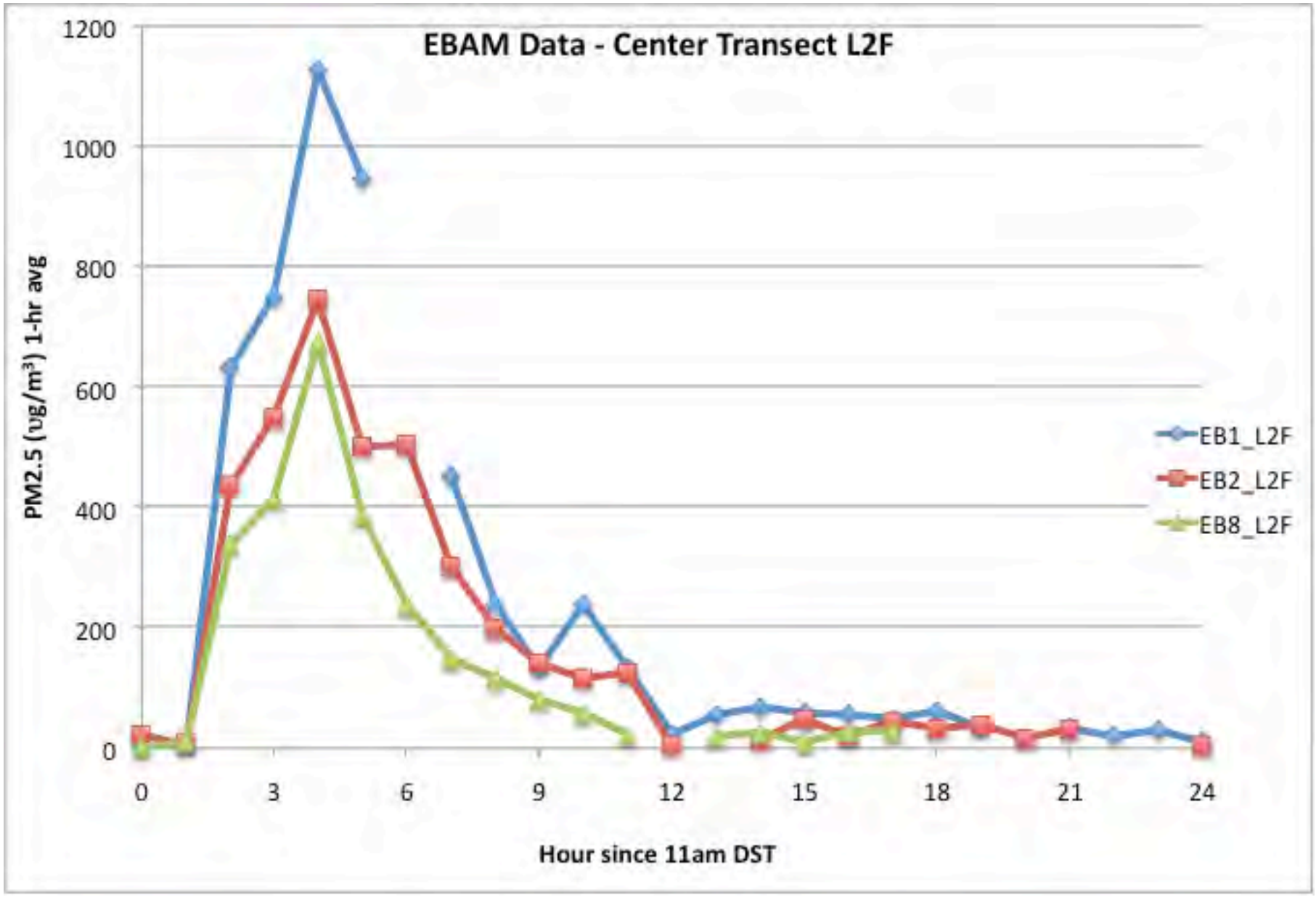


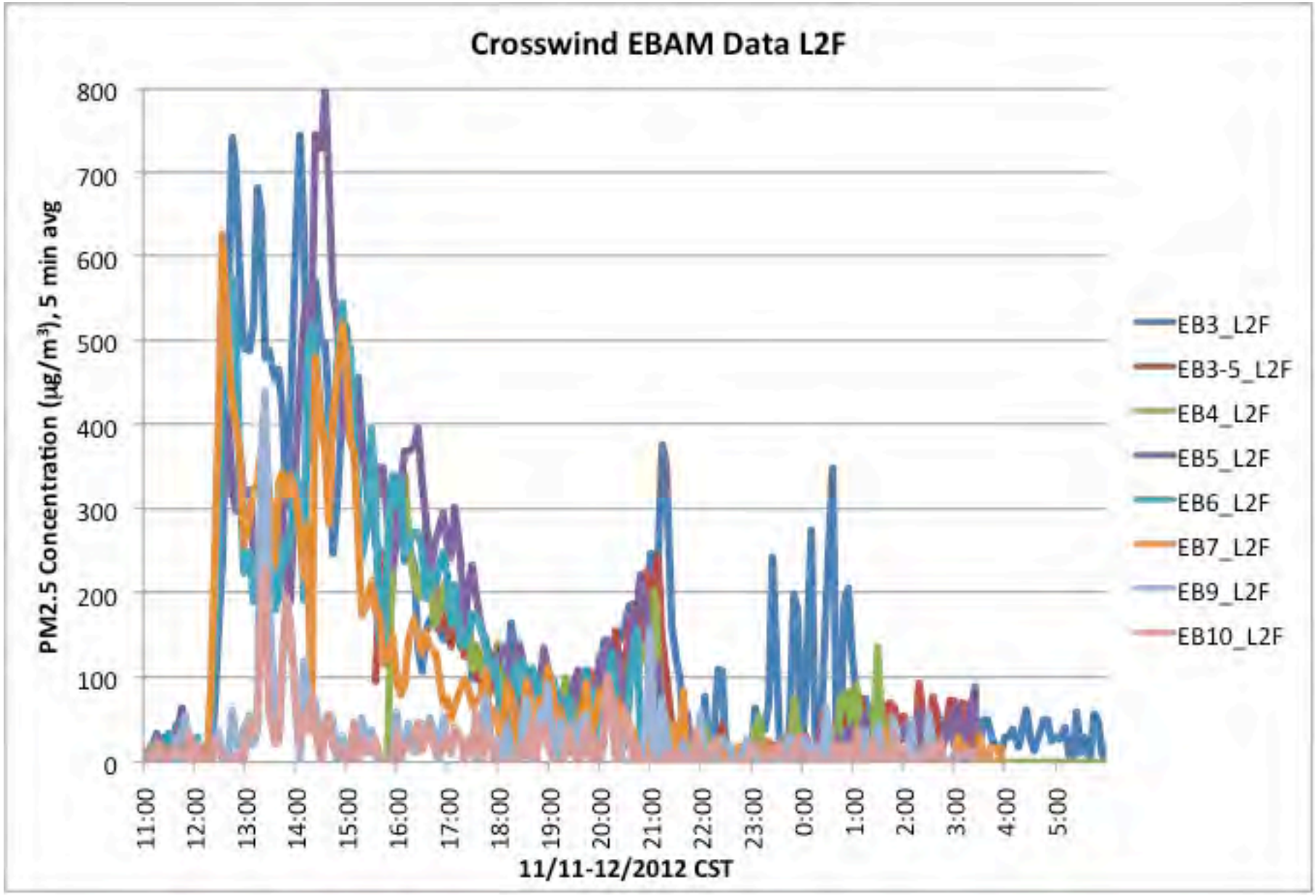

EB11-SW-L1G; Metts Continuous
s Pond
EB9-SW-L1G; Continuous
EB9-L2G
EB10-L2G
EB8-L2G
EB10-SW-L1G
EB7-L2G
EB6-L2G
EB8-L2F
EB5-L2G
EB2-L2F
EB4-L2G
EB4-SW-L1G
EB3.5-L2G
EB1-L2F
EB5-SW-L1G
EB3-SW-L1G
EB3-L2G
EB8-SW-L1G
EB6-SW-L1G
EB2-SW-L1G
EB7-SW-L1G
EB2-L2G
EB1-L2G
EB1-SW-L1G
Google earth

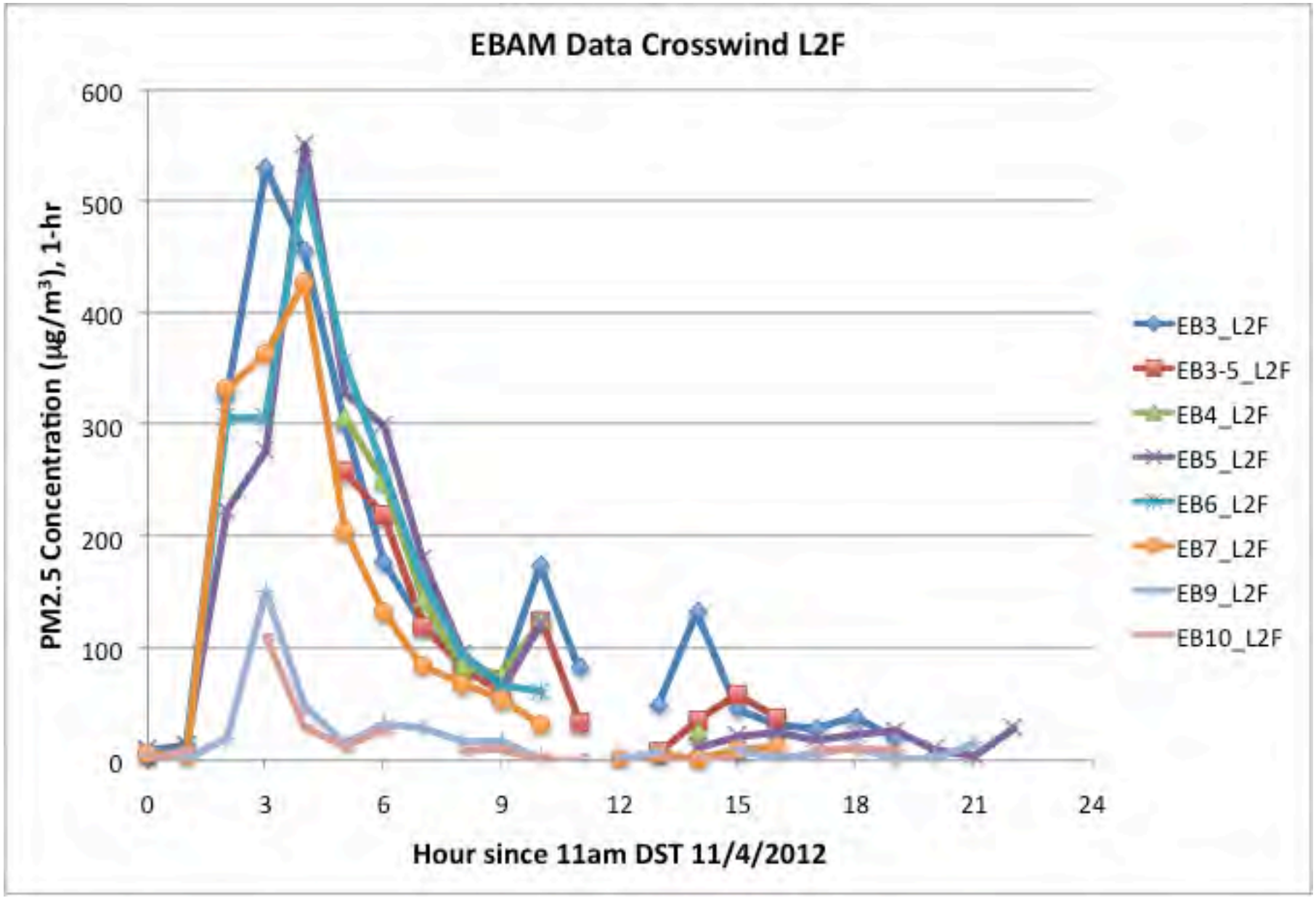

Eastern Line EBAM Data L1G
PM2.5 Concentration (µg/m³) 5 min avg
2500
2000
1500
1000
500
0
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
1:00
2:00
3:00
4:00
5:00
6:00
11/4-5/2012 DST
EB1_L1G
EB2_L1G
EB3_L1G
EB4_L1G


EBAM Data - Eastern Line L1G
PM2.5 (ug/m³) 1-hr avg
500
450
400
350
300
250
200
150
100
50
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
Hour since 11am DST
EB1_L1G
EB2_L1G
EB3_L1G
EB4_L1G


Centerline EBAM Data L2F
PM2.5 Concentration (µg/m³) 5 min avg
1600
1400
1200
1000
800
600
400
200
0
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
1:00
2:00
3:00
4:00
5:00
6:00
11/11-12/2012 DST
EB1_L2F
EB2_L2F
EB8_L2F


EBAM Data - Center Transect L2F
PM2.5 (ug/m³) 1-hr avg
1200
1000
800
600
400
200
0
0
3
6
9
12
15
18
21
24
Hour since 11am DST
EB1_L2F
EB2_L2F
EB8_L2F


Crosswind EBAM Data L2F
PM2.5 Concentration (µg/m³), 5 min avg
800
700
600
500
400
300
200
100
0
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
1:00
2:00
3:00
4:00
5:00
11/11-12/2012 CST
EB3_L2F
EB3-5_L2F
EB4_L2F
EB5_L2F
EB6_L2F
EB7_L2F
EB9_L2F
EB10_L2F


EBAM Data Crosswind L2F
PM2.5 Concentration (µg/m³), 1-hr
600
500
400
300
200
100
0
0
3
6
9
12
15
18
21
24
Hour since 11am DST 11/4/2012
EB3_L2F
EB3-5_L2F
EB4_L2F
EB5_L2F
EB6_L2F
EB7_L2F
EB9_L2F
EB10_L2F

Acknowledgements

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