

Supplement to

Measurement report: Emission factors of NH₃ and NH_x for wildfires and agricultural fires in the United States

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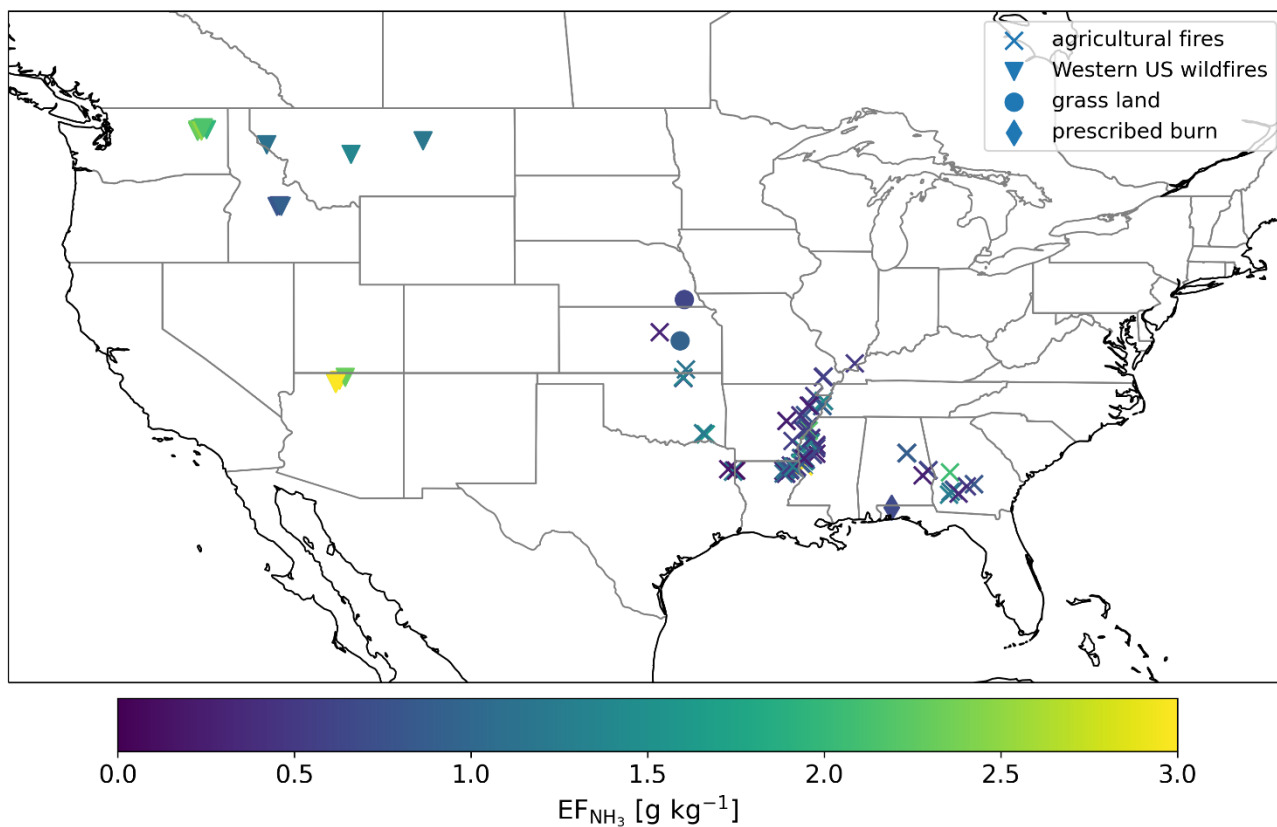
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Figure S1: Location of the fires that were sampled by the NASA DC-8 during the FIREX-AQ 2019 campaign and for which EF_{NH_3} and EF_{NH_x} values were obtained. Crosses represent agricultural fires, triangles represent forest fires, circles represent grass land fires and the diamond represents a prescribed burn in a forest in the Southern US.

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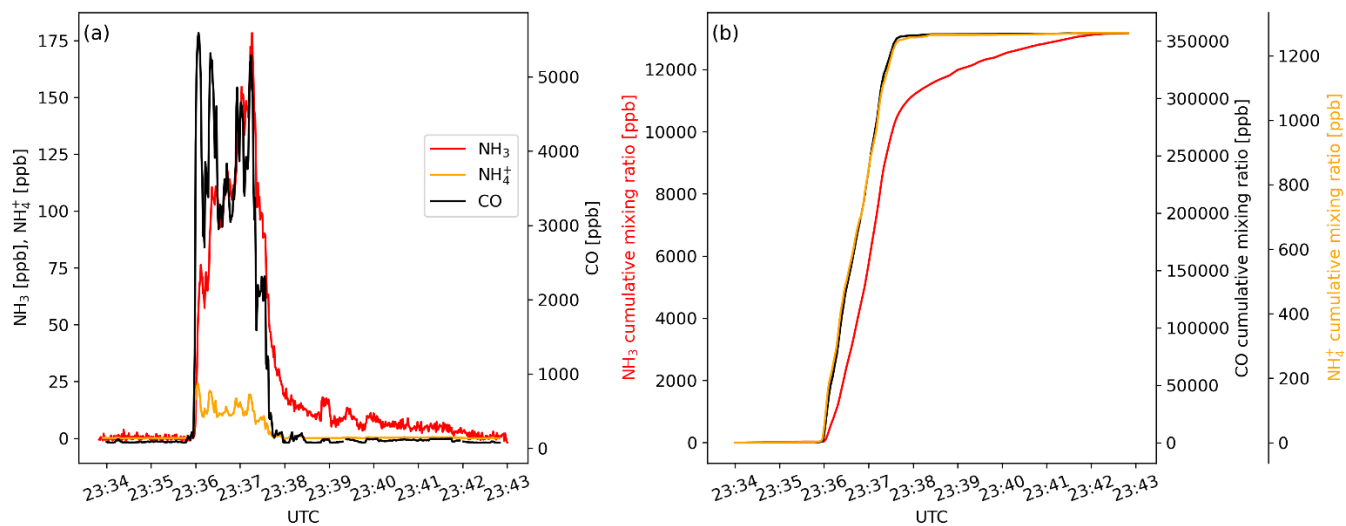
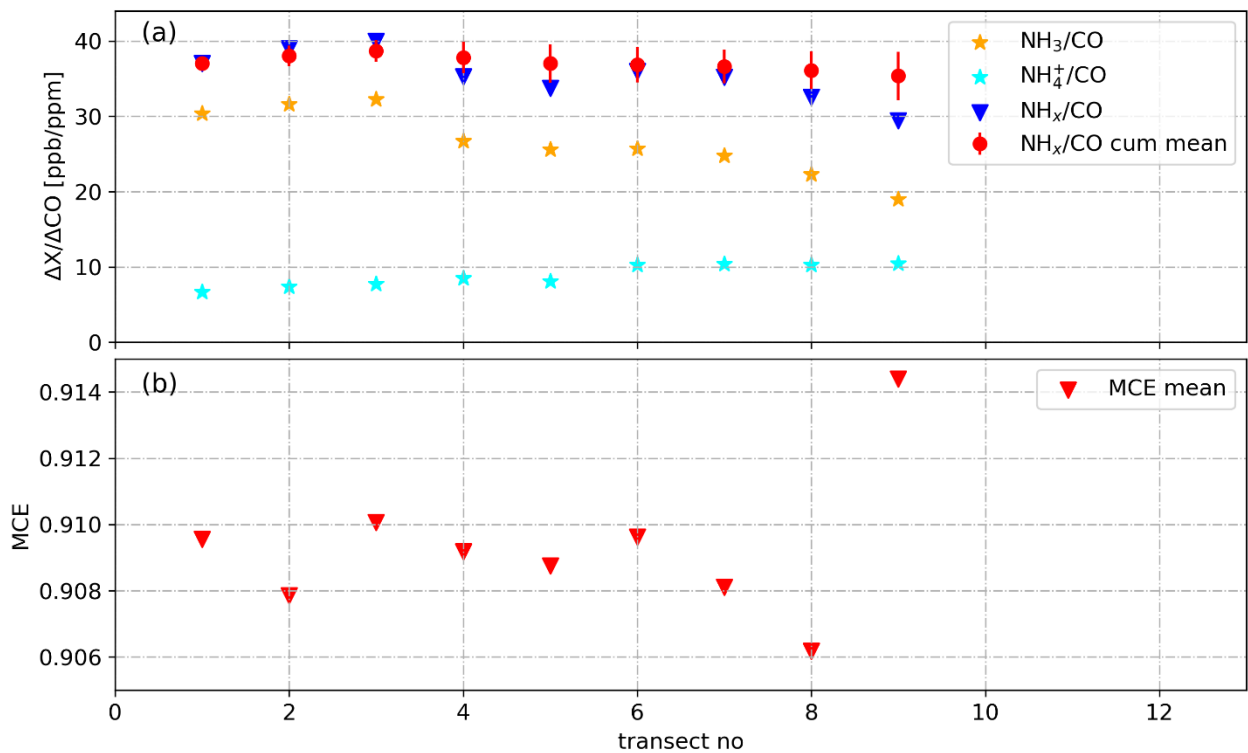


Figure S2: Time traces of (a) mixing ratios of NH_3 , NH_4^+ , and CO and of (b) cumulative mixing ratios of NH_3 , NH_4^+ , and CO as measured during a transect of the Williams Flats fire plume on 7 August 2019.



40 **Figure S3: (a) NH_3/CO , NH_4^+/CO , NH_x/CO and cumulative mean NH_x/CO as measured during nine downwind transects of the plume emitted from the Williams Flats Fire on 7 August 2019. NH_3/CO increases during the first three transects which were thus used for determining EF_{NH_3} and EF_{NH_x} . (b) Mean MCE as measured for the same nine downwind transects. MCE remains stable at ~ 0.91 indicating stable burning conditions.**

45 **Table S1: Main fuels of the six wildfires in the Western US that were sampled during FIREX-AQ 2019 and for which EF_{NH_3} values were obtained.**

Fire	Major fuel types (%)	Fuel (FCCS 2014) 30m
Shady	Modified and managed mesic timber litter 3 (34.4%), modified and managed xeric grass shrub 1 (21.5%), modified and managed xeric timber litter 3 (18.0%), modified and managed xeric understory 2 (10.8%), Urban-Barren (6.5%)	Modified or Managed Xeric Understory 2
Williams Flats 3.8.2019	Douglas-fir-Pacific ponderosa pine/oceanspray forest (29.3%), Idaho fescue-bluebunch wheatgrass grassland (19.6%), Sagebrush shrubland – post prescribed burn (12.8%), Wheatgrass-cheatgrass grassland – exotic species (10.4%), Ponderosa pine savanna (8.0%)	Sagebrush shrubland - post prescribed burn
Williams Flats 6.8.2019	Douglas-fir-Pacific ponderosa pine/oceanspray forest (56.5%), Idaho fescue-bluebunch wheatgrass grassland (9.2%), Wheatgrass-cheatgrass grassland – exotic species (6.5%), Idaho fescue-bluebunch wheatgrass grassland – post fire (5.5%), Douglas-fir/ceanothus forest (5.3%)	Sagebrush shrubland - post prescribed burn
Williams Flats 7.8.2019	Douglas-fir-Pacific ponderosa pine/oceanspray forest (55.2%), Idaho fescue-bluebunch wheatgrass grassland (12.4%), Wheatgrass-cheatgrass grassland – exotic species (6.8%), Idaho fescue-bluebunch wheatgrass grassland – post fire (5.1%), Ponderosa pine savanna (5.0%)	Sagebrush shrubland - post prescribed burn
Castle 12.8.2019	Ponderosa pine-two-needle pinyon-Utah juniper forest (24.4%), Douglas-fir-Pacific ponderosa pine/oceanspray forest (24.4%), modified and managed xeric shrub (6.8%), Madrean pine-oak forest (6.0%), modified and managed xeric grass shrub 1 (6.0%)	Modified or Managed Xeric Timber Litter 3
Castle 13.8.2019	Ponderosa pine-two-needle pinyon-Utah juniper forest (24.4%), Douglas-fir-white fir-ponderosa pine forest (13.7%), Madrean pine-oak forest (12.3%), Quaking aspen forest (10.9%), Interior Douglas-fir-ponderosa pine/gambel oak forest (7.8%)	Modified or Managed Xeric Timber Litter 3
Ridge Top	Bluebunch wheatgrass-bluegrass grassland (66.2%), Ponderosa pine savanna (7.4%), modified and managed xeric grass shrub 1 (7.3%), sagebrush shrubland - post prescribed burned (7.2%), Greasewood shrubland (5.9%)	Modified or Managed Xeric Grass Shrub
Mica/Lick Creek	Grand fir-Douglas-fir forest (69.9%), Douglas-fir-Pacific ponderosa pine/oceanspray forest (11.3%), Showy sedge-black alpine sedge grassland (7.0%), Black cottonwood-Douglas-fir-quaking aspen forest (4.9%), modified and managed xeric shrub 2 (2.6%)	Mica Creek: Grand fir-Douglas-fir forest Lick Creek: Modified or Managed Mesic
Horsefly	Subalpine fir-lodgepole pine-whitebark pine-Engelmann spruce forest (42.8%), Douglas-fir-Pacific ponderosa pine/oceanspray forest (27.6%), Mature lodgepole pine forest (14.1%), Interior ponderosa pine-Douglas-fir forest (3.1%), Whitebark pine/subalpine fir forest (3.0%)	Subalpine fir-lodgepole pine