

COLOMBIA - SWEDEN
Bilateral cooperation on PM2.5 y BC

Workshop 9 - 11 October 2019

**Status of the emission inventory to be used
for air quality modeling**



Res. No. 16740, 2017-2021.



Vigilada MinEduación.



Which are the emission sources we want to describe?

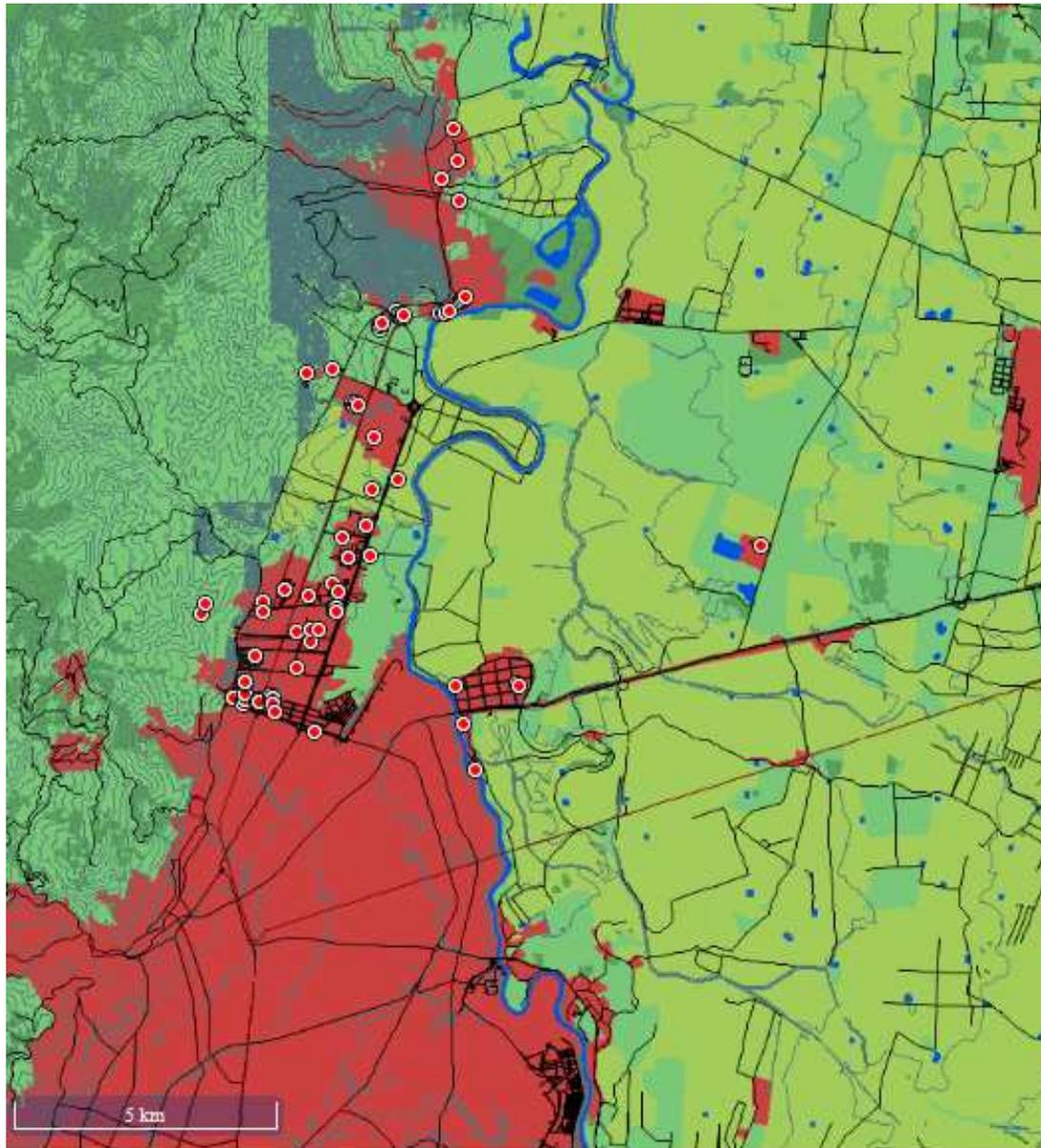


Pollutants: PM, NO_x, SO_x, NH₃, CO, VOC

Sources:

- Industrial point sources
 - Mobile sources (public transport and private vehicles)
 - *Working machines (constructions etc)*
 - *Residential*
 - Forest fires
 - Agriculture combustion (e.g. sugar cane burning)
 - Biogenic
- } *if possible....*

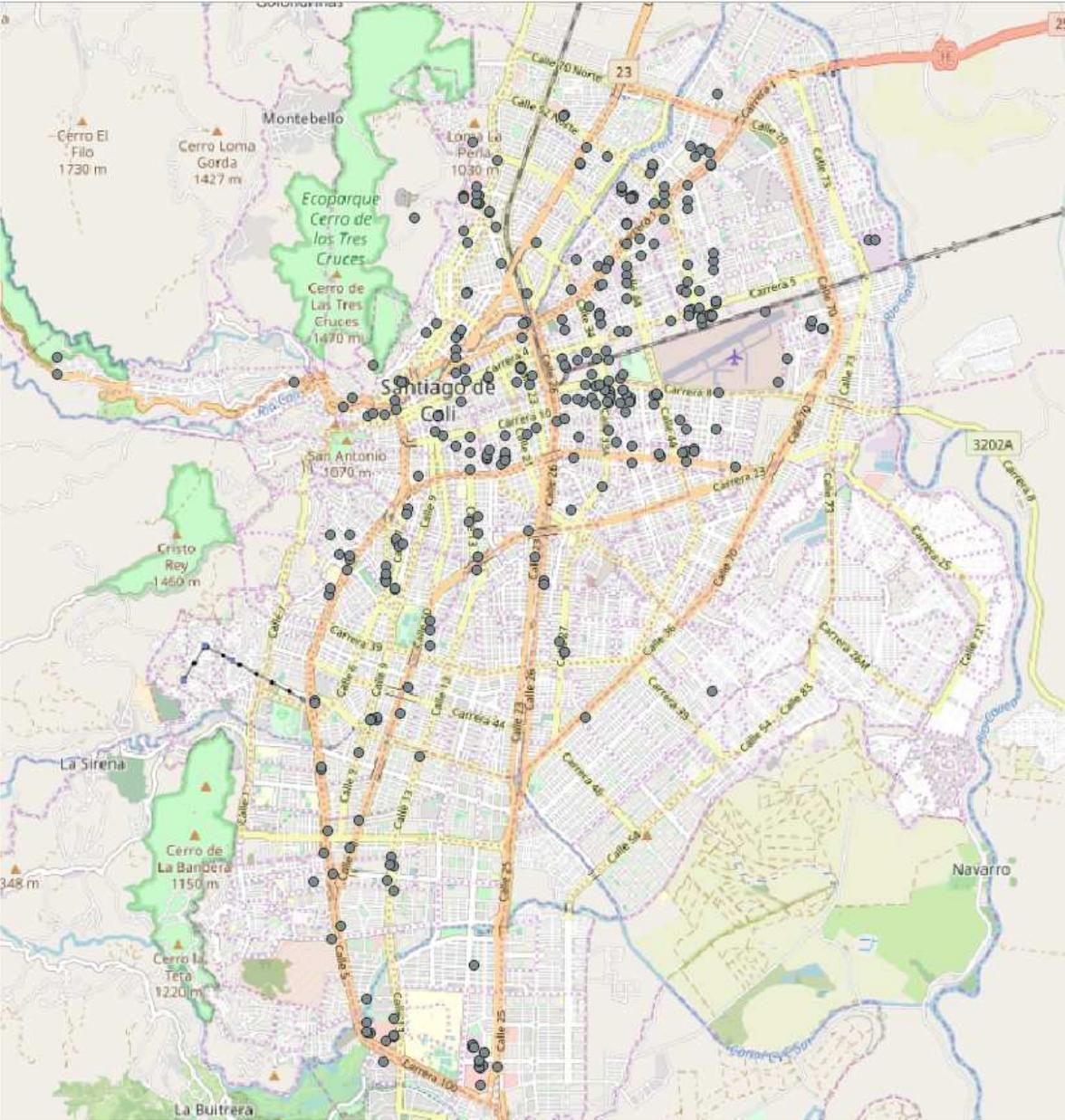
Industrial Yumbo & Palmira (from CVC)



Emissions tons/year:

PM:	2754
NOx:	4793
SOx:	15228
NH3:	-
CO:	-
VOC:	11

Industrial Cali (from DAGMA)



Emissions tons/year¹⁾:

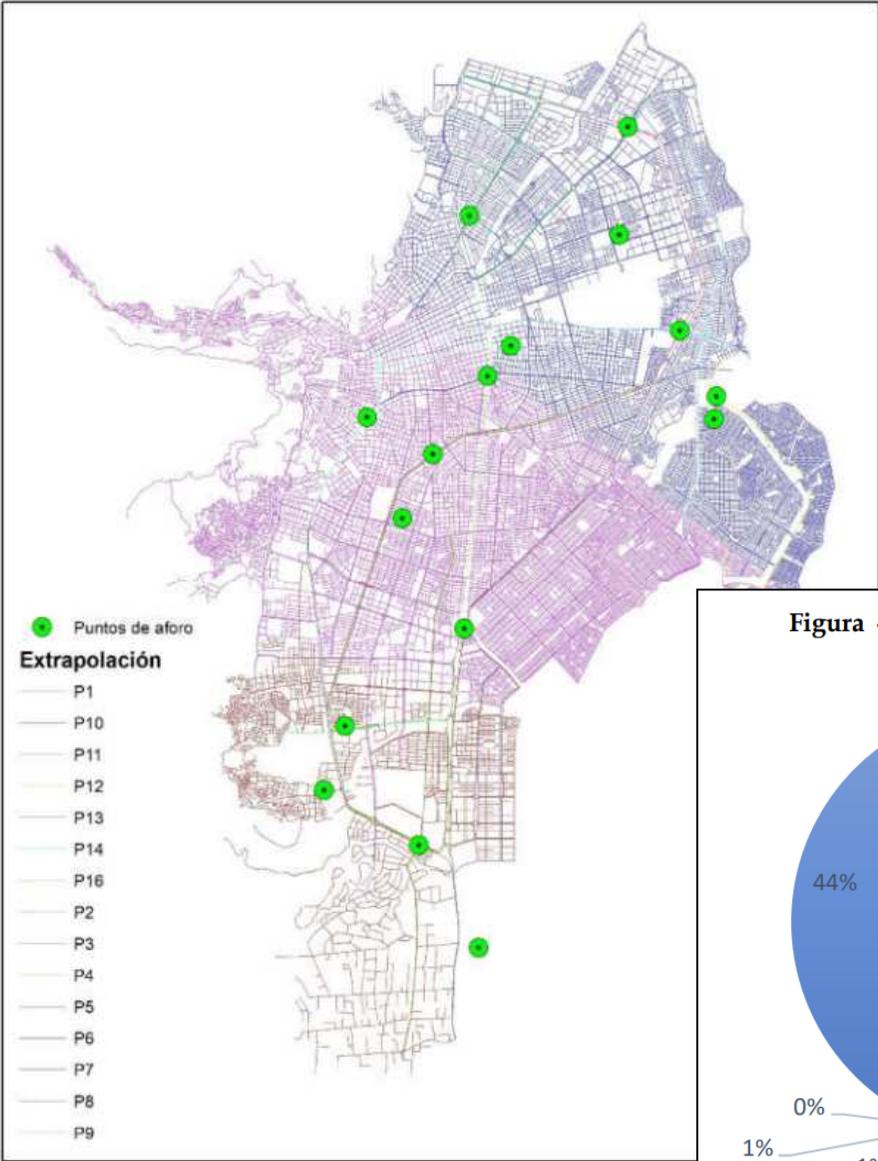
PM:	224
NOx:	691
SOx:	98
NH3:	-
CO:	552
VOC:	113

1) From:
"Informe final actualización del inventario de emisiones de Santiago de Cali"
(Febrero de 2018)

Mobile sources (from DAGMA)



Figura 48 Punto de aforo fuente móviles y extrapolación vial

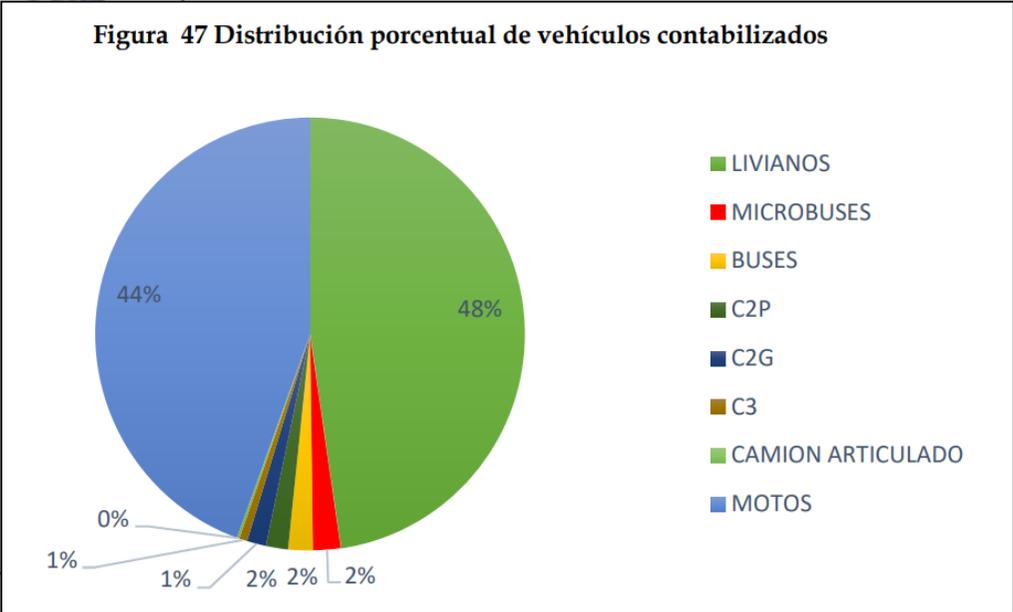


Emissions tons/year¹⁾:

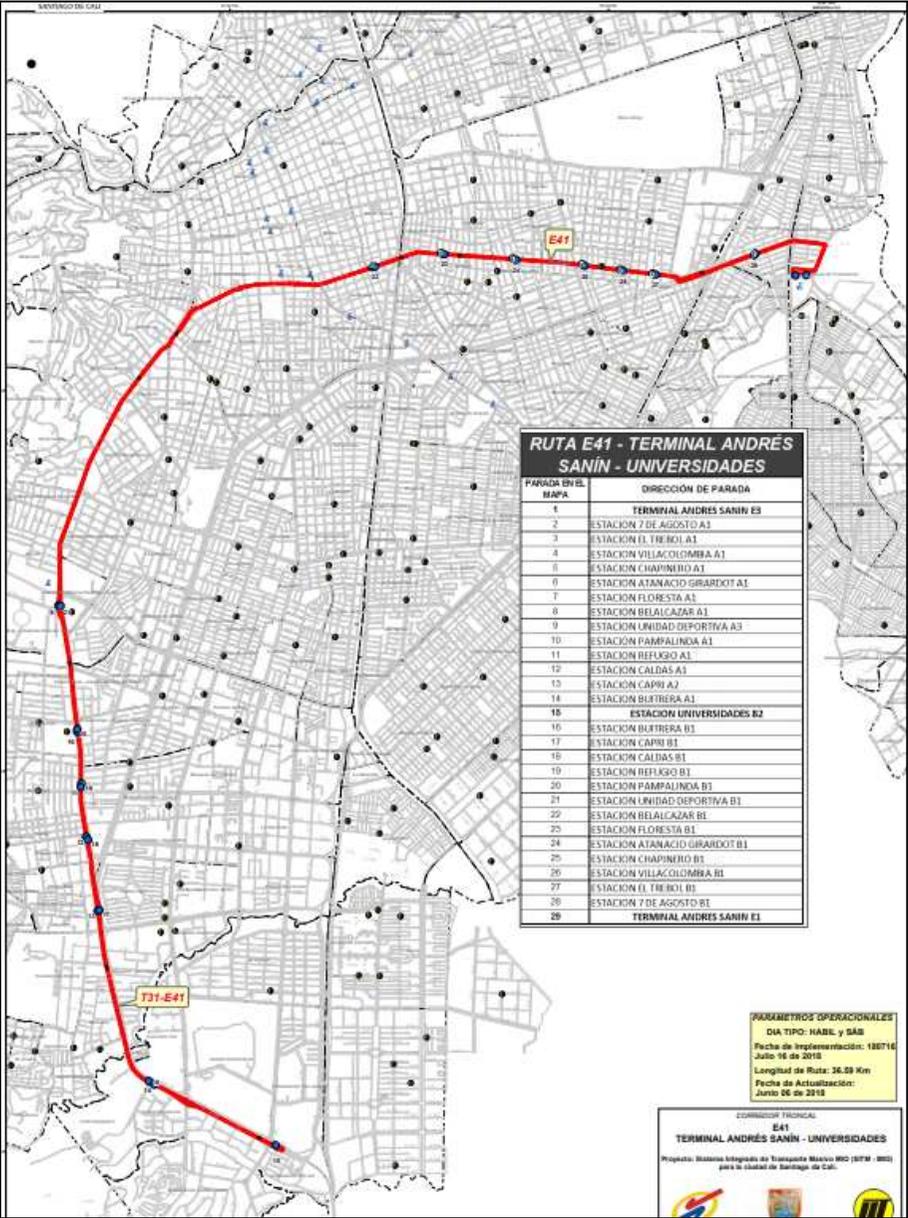
PM: 2751
 NOx: 33267
 SOx: 1354
 NH3: -
 CO: 378389
 VOC: 60810

1) From:
 "Informe final actualización del inventario de emisiones de Santiago de Cali" (Febrero de 2018)

Figura 47 Distribución porcentual de vehículos contabilizados

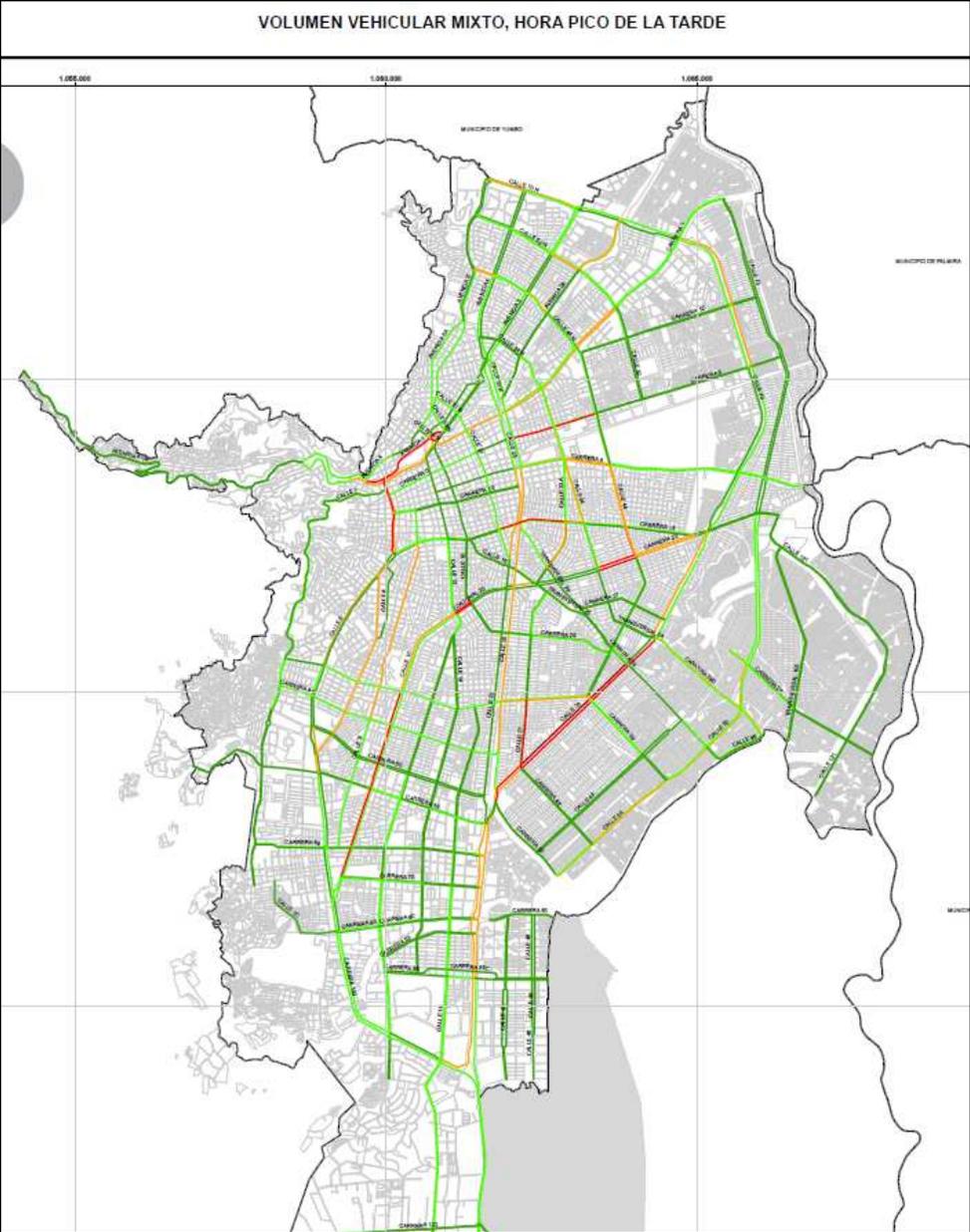


Mobile sources (public transport)



- For every bus route:
- describe bus technology
 - bus time table

Mobile sources (private transport)



Describe:

- Fleet composition
- Vehicle technology
- Traffic flows (peak/average)

CAMS Global Fire Assimilation System - GFAS

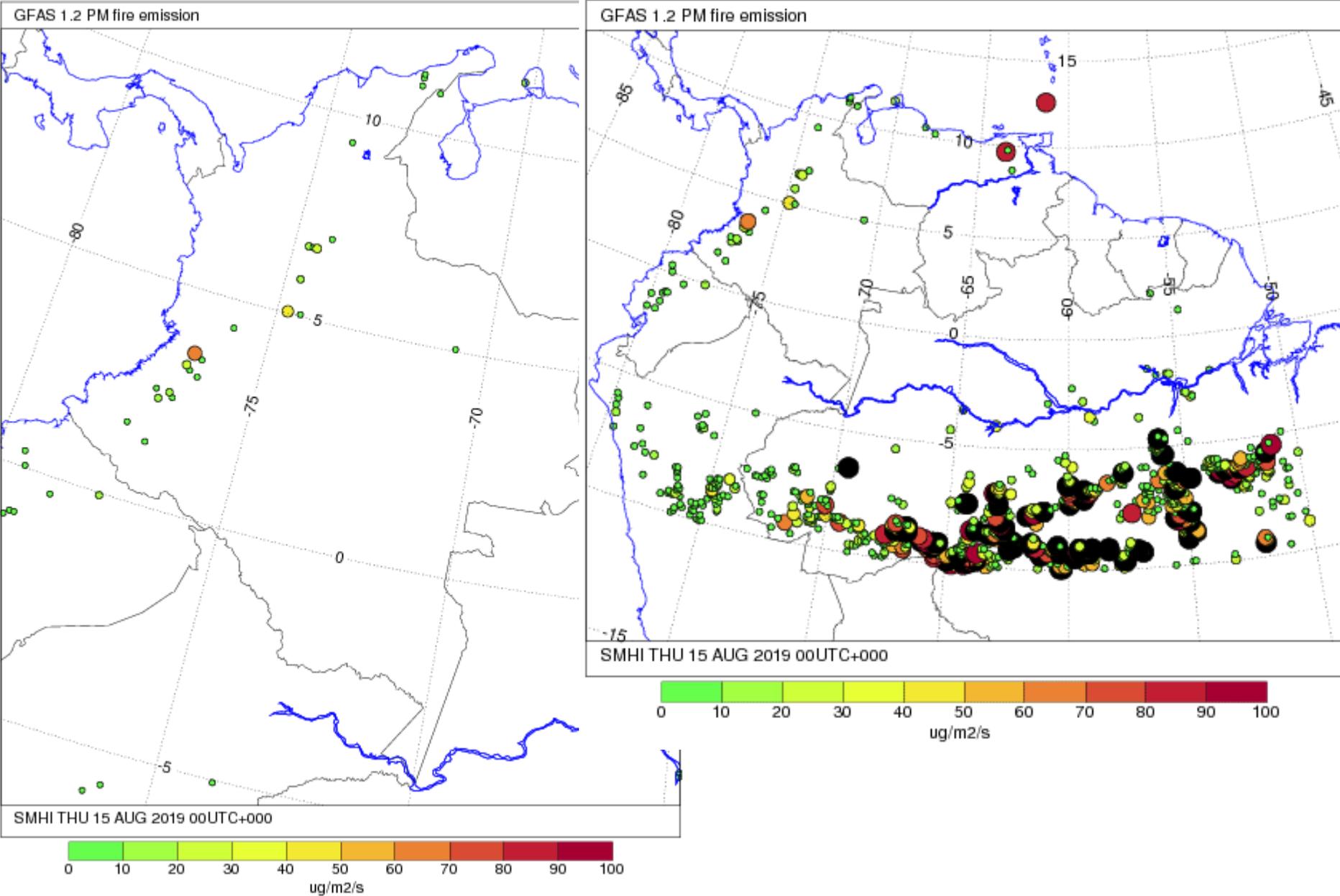
- GFAS assimilates fire radiative power (FRP) observations from satellite-based sensors to produce daily estimates of biomass burning emissions.
- Information about injection heights derived from fire observations and meteorological information from the operational weather forecasts of ECMWF.
- FRP observations currently assimilated in GFAS are the NASA Terra MODIS and Aqua MODIS active fire products (<http://modis-fire.umd.edu/>).
- GFAS data includes: Fire Radiative Power (FRP), dry matter burnt and biomass burning emissions.
- Data are available globally on a regular lat-lon grid with horizontal resolution of 0.1 degrees from 2003 to present.

Kaiser et al. (2012). Biomass burning emissions estimated with a global fire assimilation system based on observed fire radiative power. *Biogeochemistry*, 9:527-554.

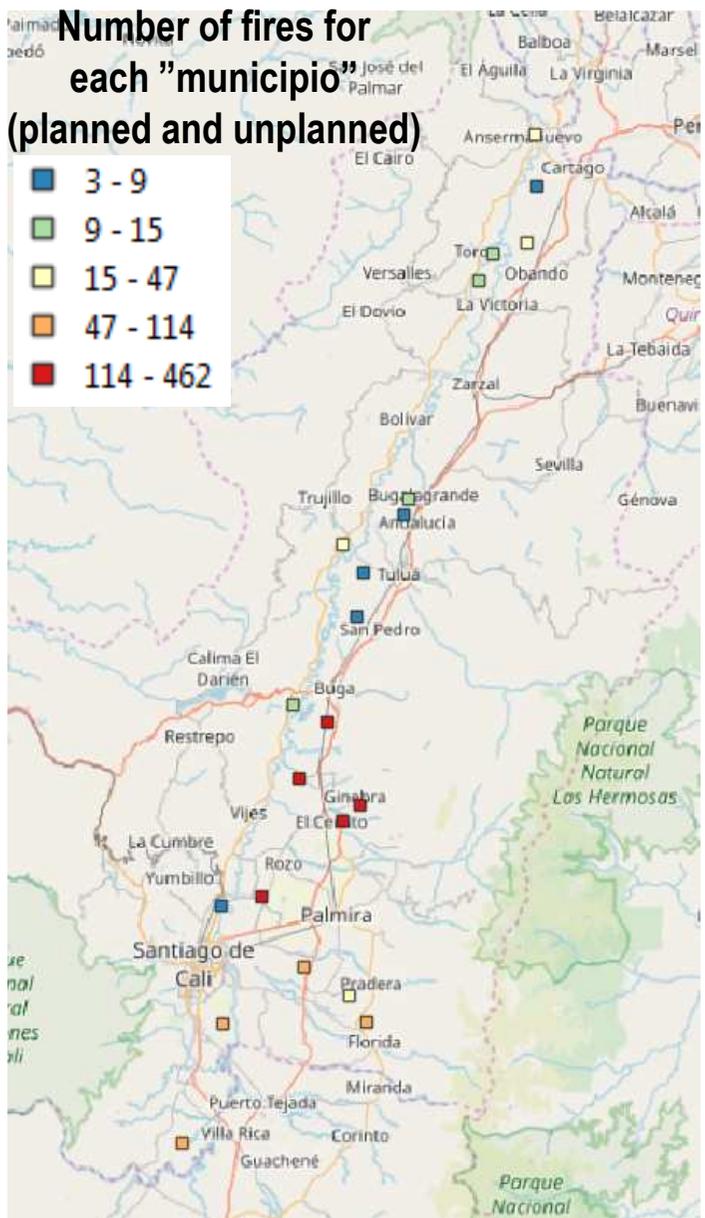
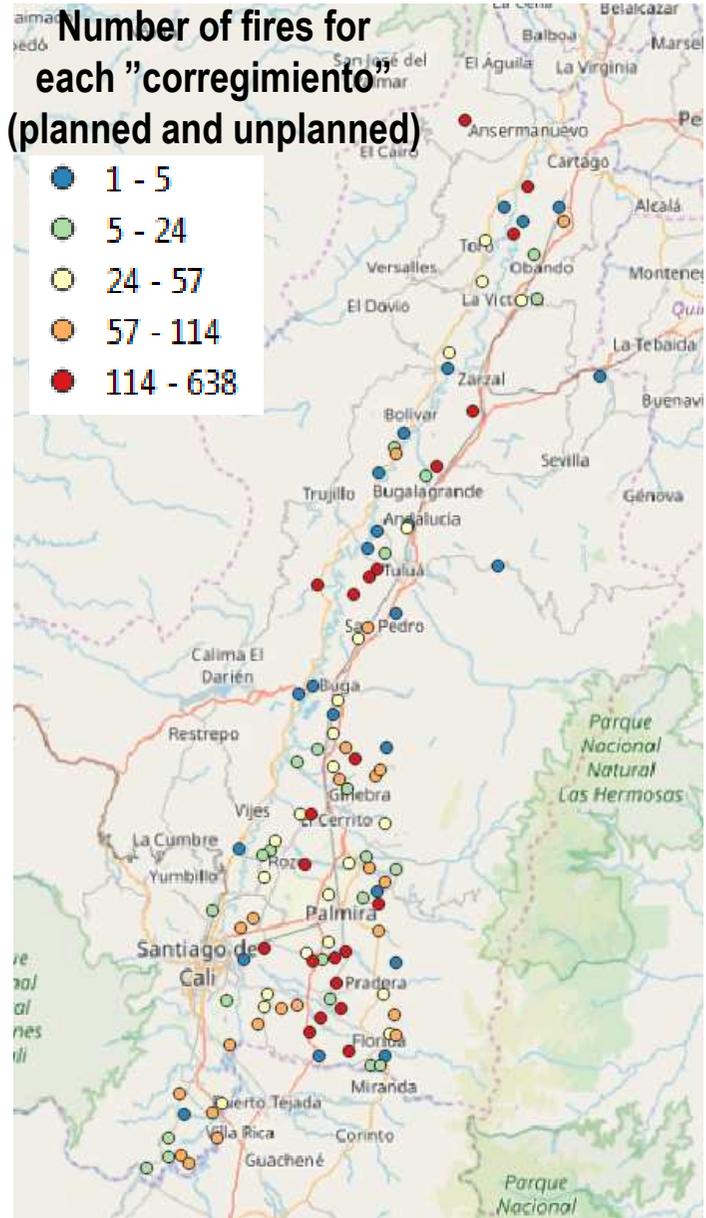
GFAS parameters

Gridded plume rise model parameters	units
Mean altitude of maximum injection	m
Altitude of plume top	m
GFAS analysis surface parameters (emissions)	units
CO ₂ , CO, CH ₄ , NMHC, H, NO _x , N ₂ O, PM _{2.5} , TPM, TC, OC, BC, combustion rate, SO ₂ , individual hydrocarbons, DMS, NH ₃	kg m ⁻² s ⁻¹
Gridded satellite parameters	units
Wildfire viewing angle of observation	degrees
Wildfire fraction of area observed	dimensionless
Number of positive FRP pixels per grid cell	
Wildfire radiative power	W m ⁻²
Wildfire radiative power maximum	W

Forest fires (large-scale, from satellite information)



Agriculture biomass combustion (from Cenicaña)



Fires 2018: 11.495
of which
"quemadas": 80%
"incendios": 20%

Area affected for each fire:
mean: 4.0 ha
median: 4.0 ha
max: 57.2 ha

Area affected for each "quema":
mean: 3.9 ha
median: 4.0 ha
max: 14.4 ha

Biogenic emissions
