We used PWRF-STILT footprints to determine the contribution of fire emissions to black carbon observations at the aerosol sampler location. The footprints for CRV are on a 0.5° latitude-longitude grid with a temporal resolution of 1 hour during the day (hours 0600 to 1800 local time) and 3 hours during the night (hours 1800 to 0600). The footprints are multiplied by an a *priori* flux field, defined as the black carbon emissions per fire, to quantify the concentration measured at the aerosol sampler locations. This approach was done from day of year 152 to day of year 244.

In case you need more info, here's the math I used to convert from kg C m^{-2} (fire emissions of carbon from AKFED) to umol BC m^{-2} sec^{-1} (In the text above this is the a priori flux field per grid cell)…

Conversion to BC

$$\frac{\frac{kgC}{m^2} * \frac{1kgB}{0.45\ kgC} * \frac{0.5gBC}{1kgB} * \frac{1molBC}{12.01gBC} * \frac{1x10^6 \mu molBC}{1molBC}}{day * \frac{24hr}{1day} * \frac{60min}{1hr} * \frac{60s}{1min}} = \frac{1.0717\ \mu molBC}{m^2/s}$$

Here's the math I used to convert to units of ug m^{-3}...

Conversion of BC to units of µg/m^3

1. Write ppm in terms of volume (cubic meters)

$$1\ ppm\ BC = \frac{1\ cm^3\ BC}{1\ m^3\ air}$$

2. Convert cm^3 of BC to µg BC using density as estimated from ideal gas law

PV = nRT
d = g/V = M(n/V) = MP/RT

$$d = \frac{MP}{RT} = \frac{\frac{12g}{mol} * 1atm}{\frac{82.06\ atm\ cm^3}{mol\ K} * 298\ K} = \frac{0.00049072g}{cm^3} = \frac{490.72\mu g}{cm^3}$$

3. Multiply ppm BC by volume by the density of BC in µg/cm^3 to get µg/m^3

$$\frac{1\ cm^3\ BC}{1\ m^3\ air} * \frac{490.72\mu g}{cm^3} = \frac{490.72\mu g}{m^3}$$