Overview of VOC measurements in Switzerland 1994-present

In **Figure 1** yearly benzene and toluene concentrations are shown from Dübendorf, a suburban site near Zürich. These are the longest NMHC time series in Switzerland, where benzene, toluene and xylenes (BTX) have been measured since 1994. Levels are declining because of different measures to curb VOCs. In the 1990s the catalytic converter systems have been introduced and further reductions were achieved for benzene by restricting the content of this carcinogenic substance in car fuels from 5% to 1% and for toluene by a country-wide solvent tax.

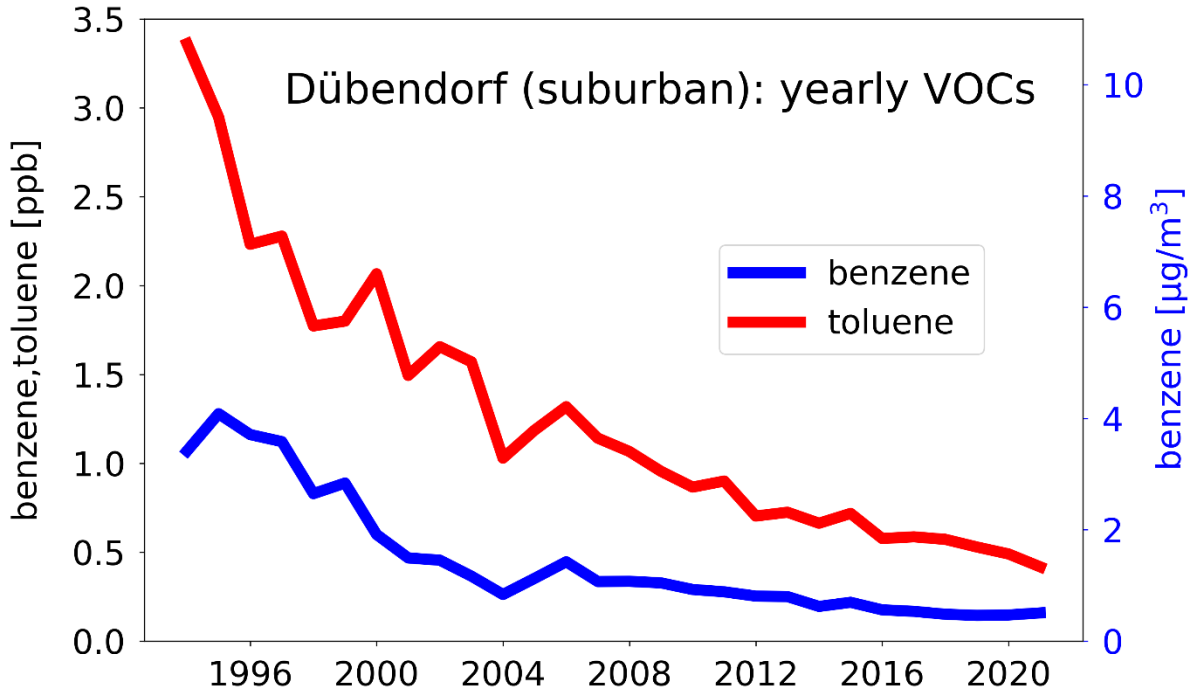

Figure 1: *Benzene and toluene at the suburban site of Dübendorf.*

In **Figure 2** measurements at Dübendorf (suburban site near Zürich) are shown as monthly mean concentrations. Here in addition to the decrease in concentrations already seen in Figure 1, also the annual cycle of the concentrations is visible, which is due to the higher concentration of the destroying OH-radical in the summer and higher emissions of VOCs in winter.

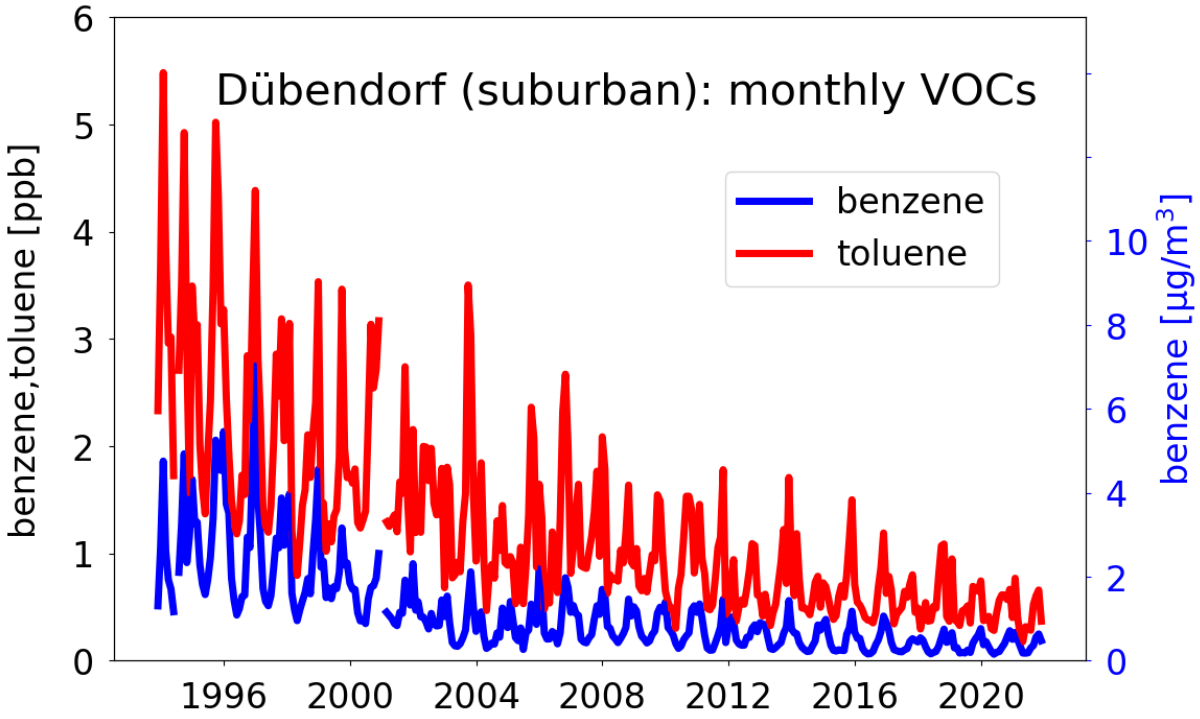

Figure 2: *Monthly averages of benzene and toluene at suburban Dübendorf.*

In **Figure 3** long-term yearly averages of selected NMHC measurements are shown at the urban site of Zürich (2001-2017), where the decline in NMHCs due to tighter restrictions on emissions is visible as well. Measurements stopped in 2017 but will be performed again in 2022-23 for a campaign within the RI-URBANS project.

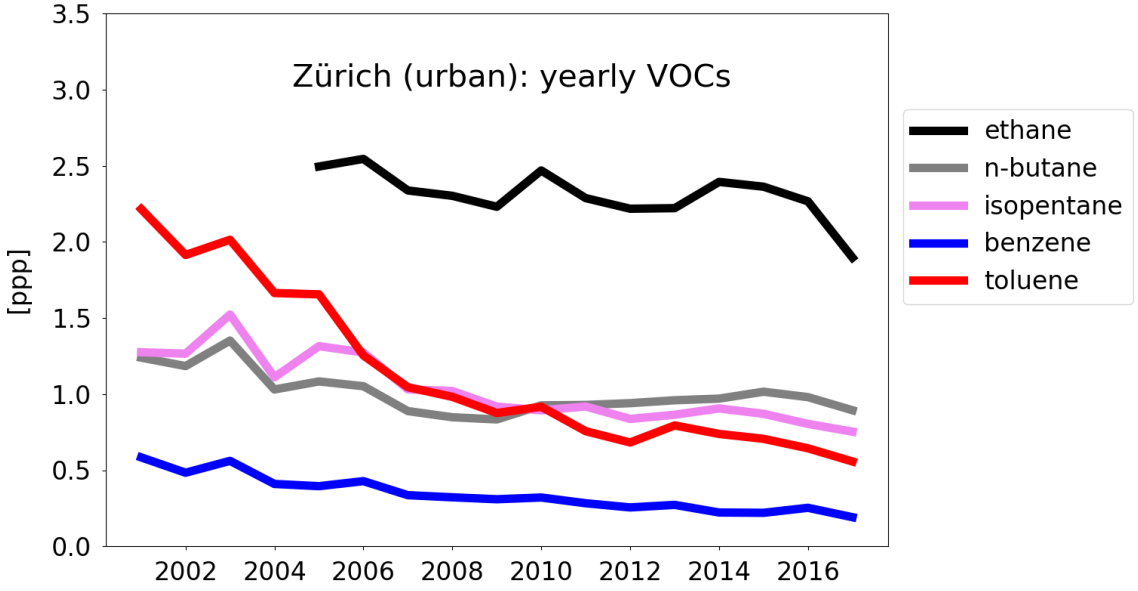

Figure 3: *Long-term NMHC measurements in Zürich.*

In **Figure 4** yearly averages of selected OVOC measurements are shown at the urban site of Zürich (2014-2017), with highest concentrations for ethanol, a well-known part of solvents and car window-wiper fluids.

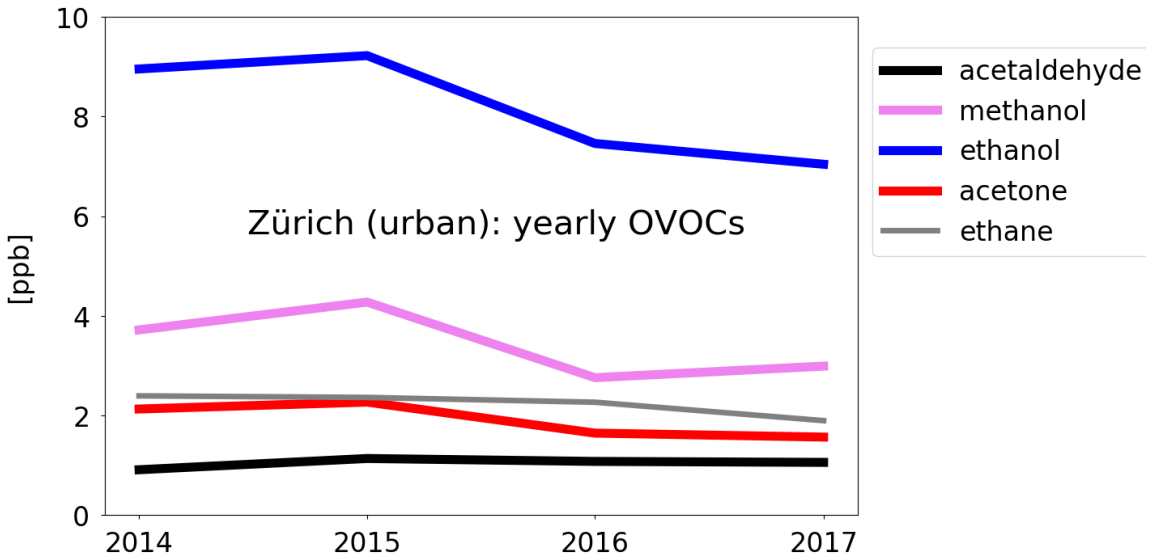

Figure 4: *Annual means of OVOCs in Zürich.*

In **Figure 5** monthly concentrations of NMHCs from the rural site of Beromünster show lower concentrations than in Zürich. In addition, the annual cycle is visible with lower concentration in summer, due to faster photochemicallly induced degradation and less emissions

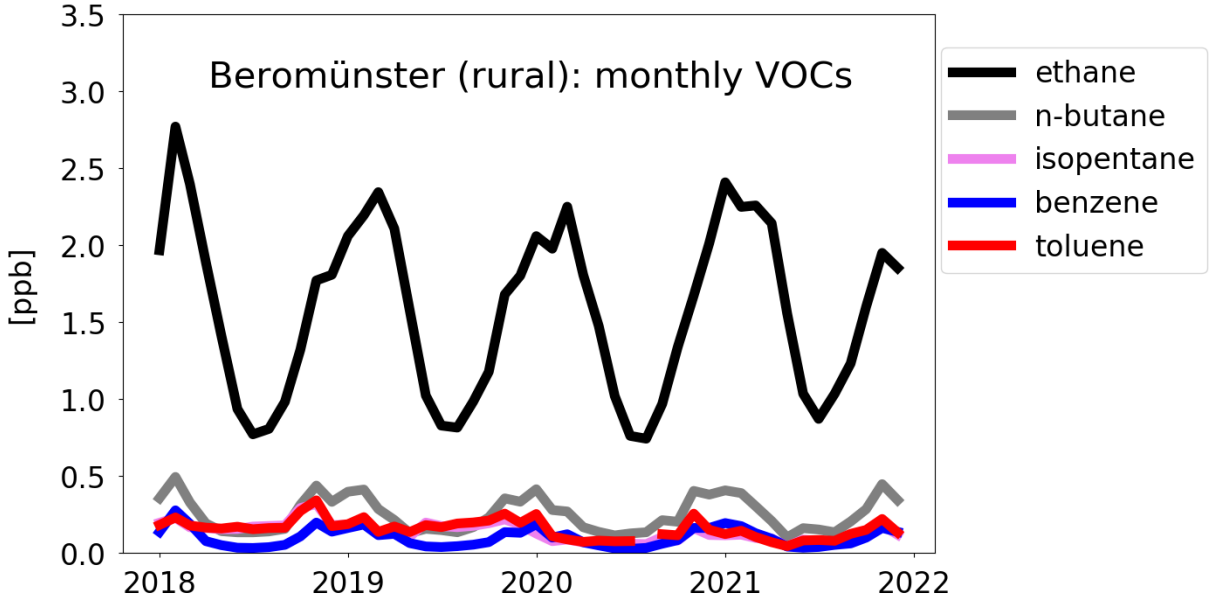

Figure 5: *Monthly NMHC data from the rural site of Beromünster.*

In **Figure 6** monthly concentrations of OVOCs from the rural site of Beromünster show maximum values in summer, as emission of OVOCs from solvents during the warm season is higher and as they are additionally produced through photochemical reactions from the destruction of NMHCs.

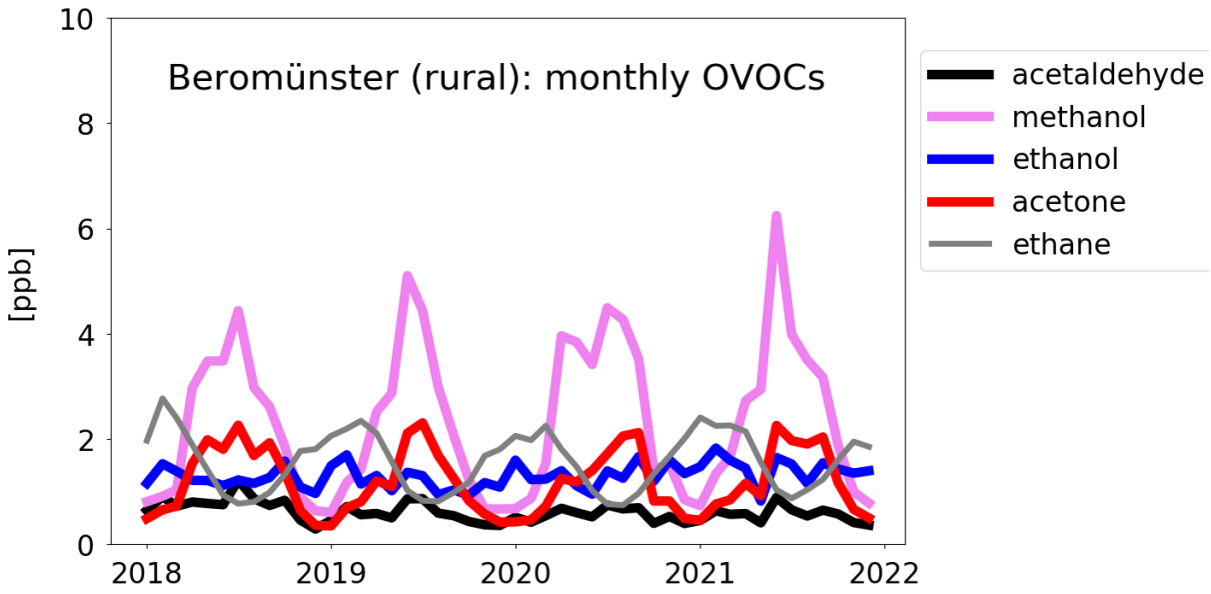

Figure 6: *Monthly OVOC data from the rural site of Beromünster.*

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