Interannual variability of summertime formaldehyde (HCHO) vertical column density and its main drivers in northern high latitudes

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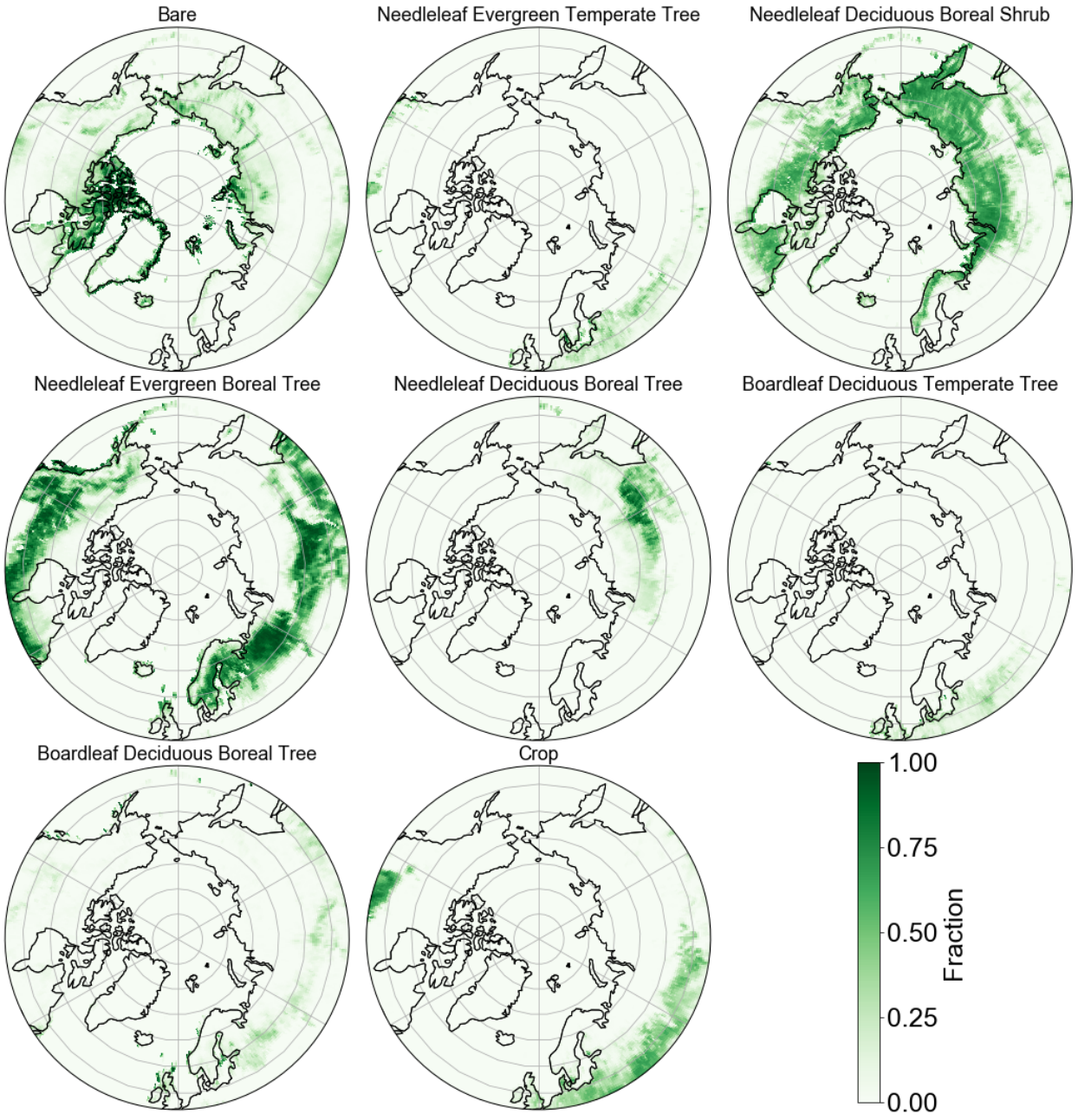

Figure S1. Fraction of major plant functional types (PFTs) over northern high latitudes. *The PFT distribution is from CLM4 model for the year 2000, with a horizontal resolution of 0.25°×0.3125°.*

Table S1. Definition of high HCHO VCD years in four study regions from GEOS-Chem, in the year 2005-2019

Region	High HCHO years
Eastern Europe	2006 2007 2010 2011 2013 2014 2016
Siberia	2006 2012 2013 2014 2016 2017 2018 2019
Northern Canada	2010 2012 2013 2014 2015 2017
Alaska	2005 2009 2013 2015 2017 2019

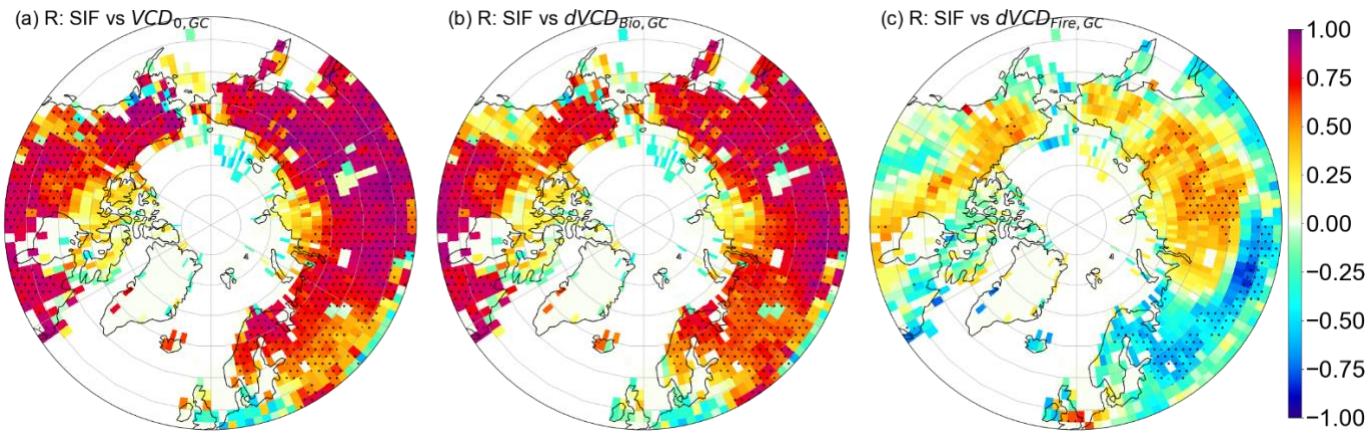

Figure S2 | Pearson linear correlation between OCO-2 SIF and GEOS-Chem dVCDs in northern high latitudes, in summers from 2015 to 2019. (a) *SIF vs* $dVCD_{Bio,GC}$. ***(b)*** *SIF vs* $dVCD_{Fire,GC}$ *. Dotted area has* $p<0.05$ *in a significance t-test.*

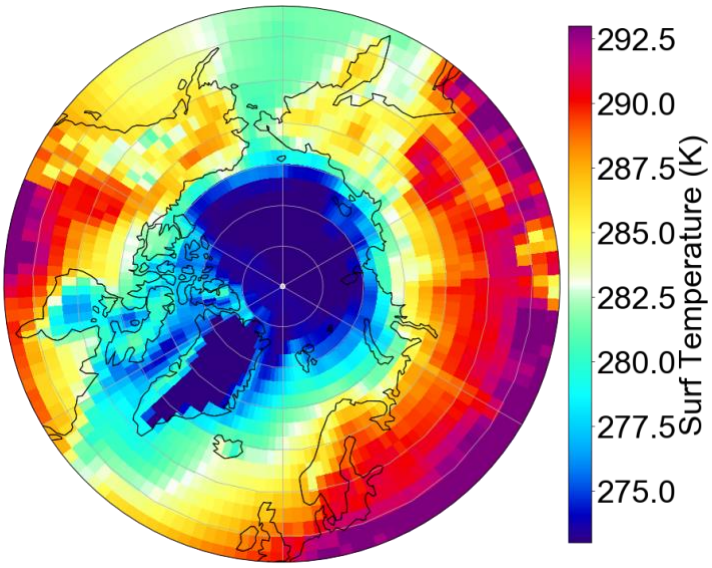

Figure S3. Monthly mean surface air temperature in northern high latitudes, Julys of 2012-2019.