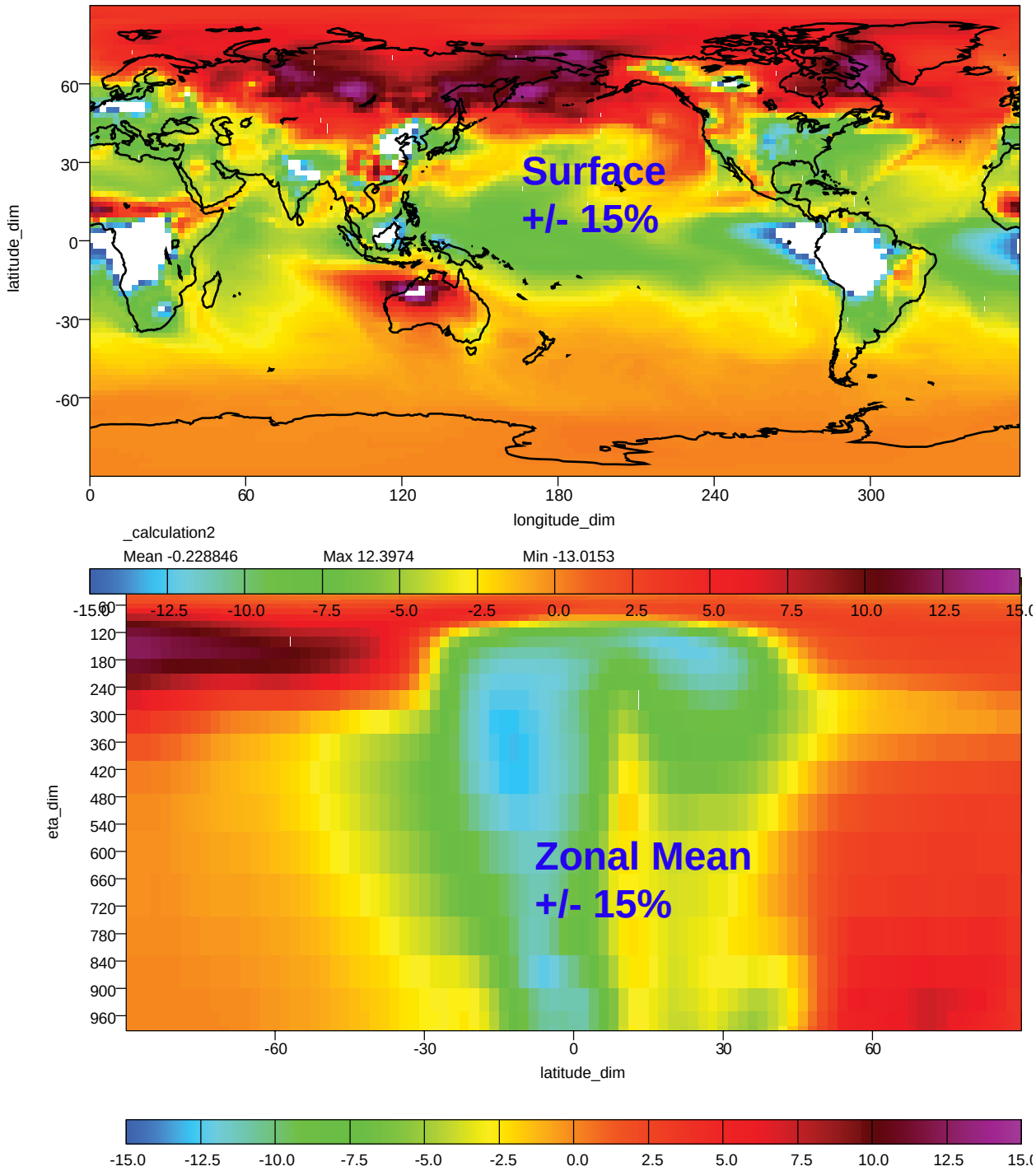
# Efforts to Update GMI Emissions

**Motivation:** **1) Improve comparisons of CTM & observations.**
**2) Improve simulation of surface ozone.**
**3) Replace outdated parameterizations.**

- ✓ Isoprene from MEGAN inventory (Bob Y./Jules: 497 Tg/y to 428 Tg/y).
- ✓ Lightning with on-line parameterization & new vertical distribution (Ken/Dale/Jules).
- ✓ Updated fossil fuel emissions to Harvard's "Edgar + others"
- ✓ reduced USA's anthropogenic NO emissions uniformly by 22% May-September (Hudman et al., 2007)
- ✓ hourly variation applied to NO on-line following Aaron van Donkelaar (Randall Martin's group/Yasuko)
- ✓ monthly variation for CO and NO applied to China (Streets)
- ✓ N. America, NO emissions partitioned in levels 1 and 2 following ratios in Harvard climatology
- ✓ Applied hourly variation online to all tropical/subtropical biomass burning trace gases from Figure 7b Boersma et al. (2007) (Yasuko)

# Ozone

**July %Difference**
**(Aura4-Aura3)/Aura3*100.**



# OH

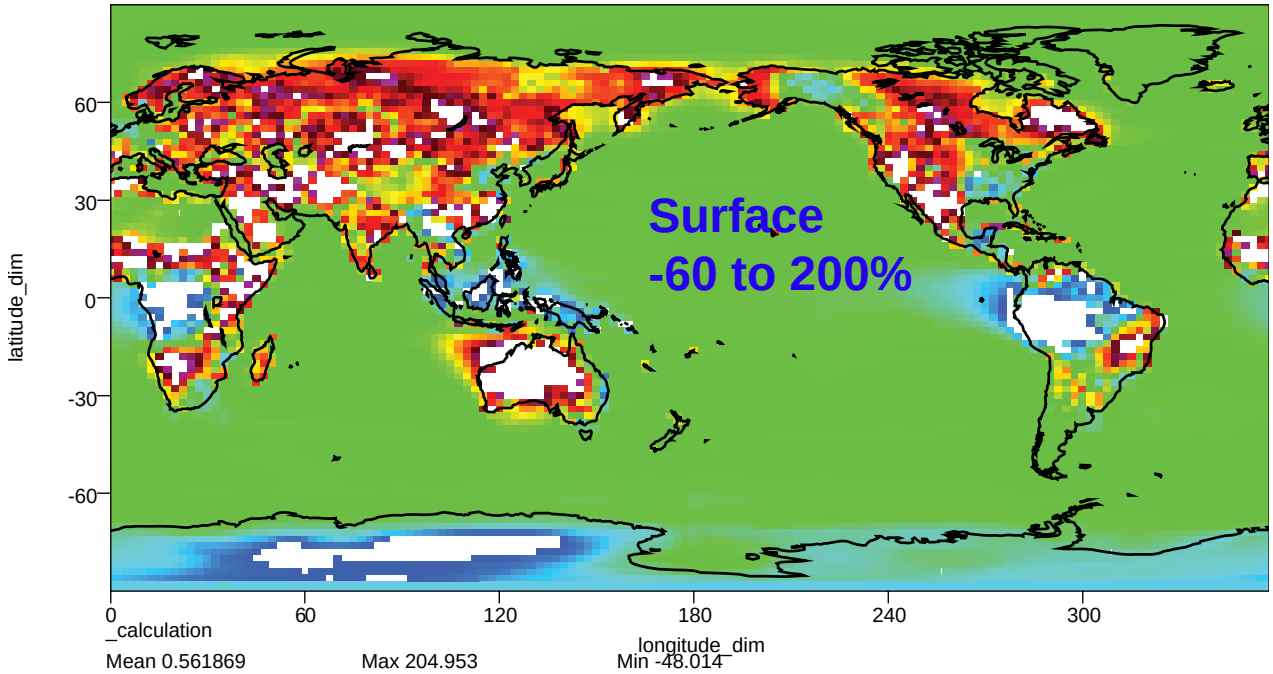
## MC lifetime
(wrt tropospheric OH)

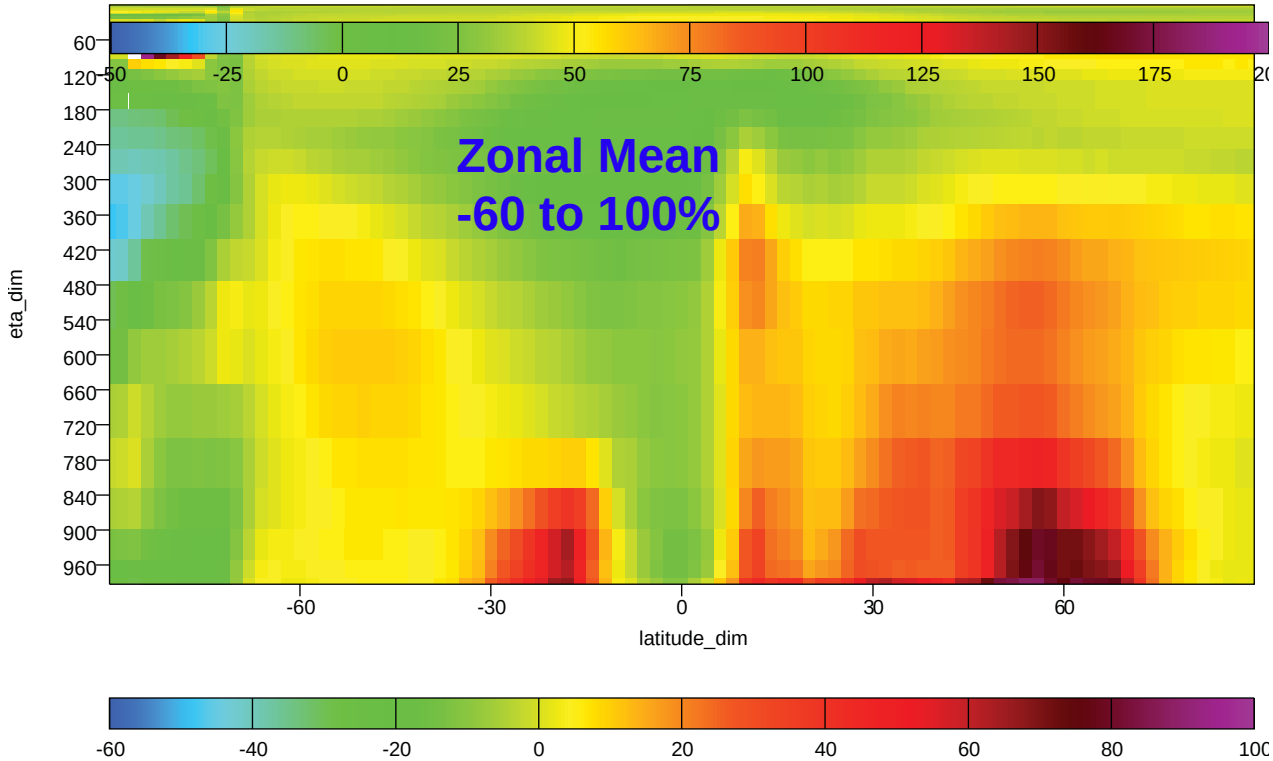
Aura3 = 6.8-6.9 y
Aura4 = 6.3-6.7 y

## Mean tropospheric OH
($x10^6$ molec/$cm^3$)

Aura3 = 0.83-0.86
Aura4 = 0.83-0.87

## OH: July %Difference
(Aura4-Aura3)/Aura3*100.



# CO

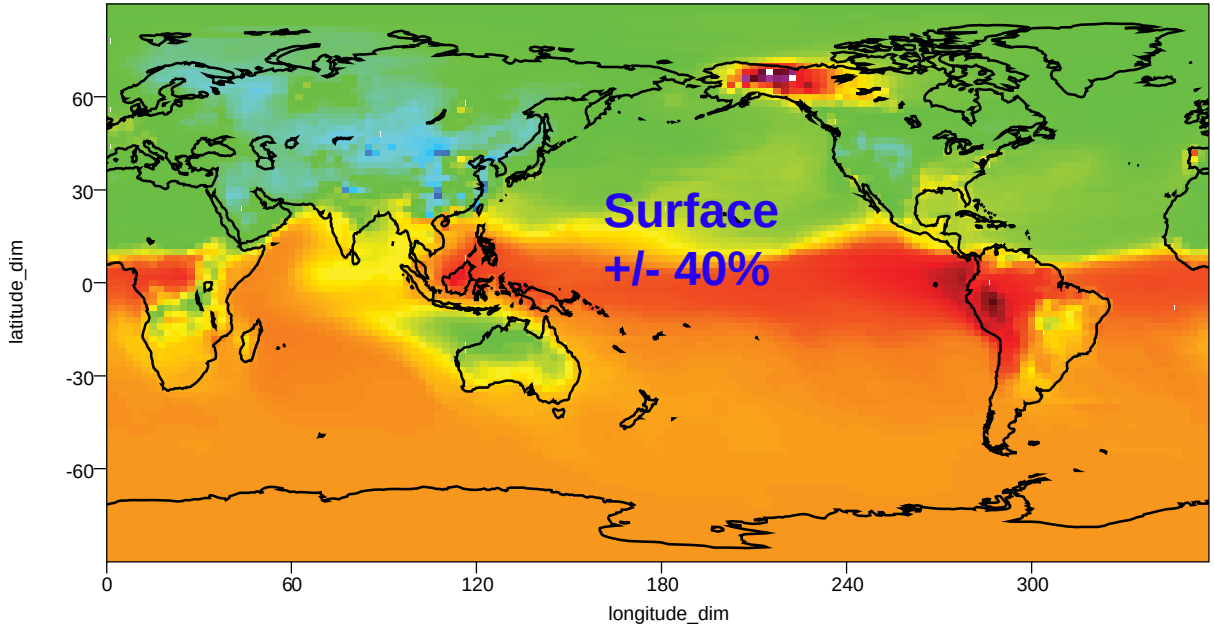
**MC lifetime**
**(wrt tropospheric OH)**

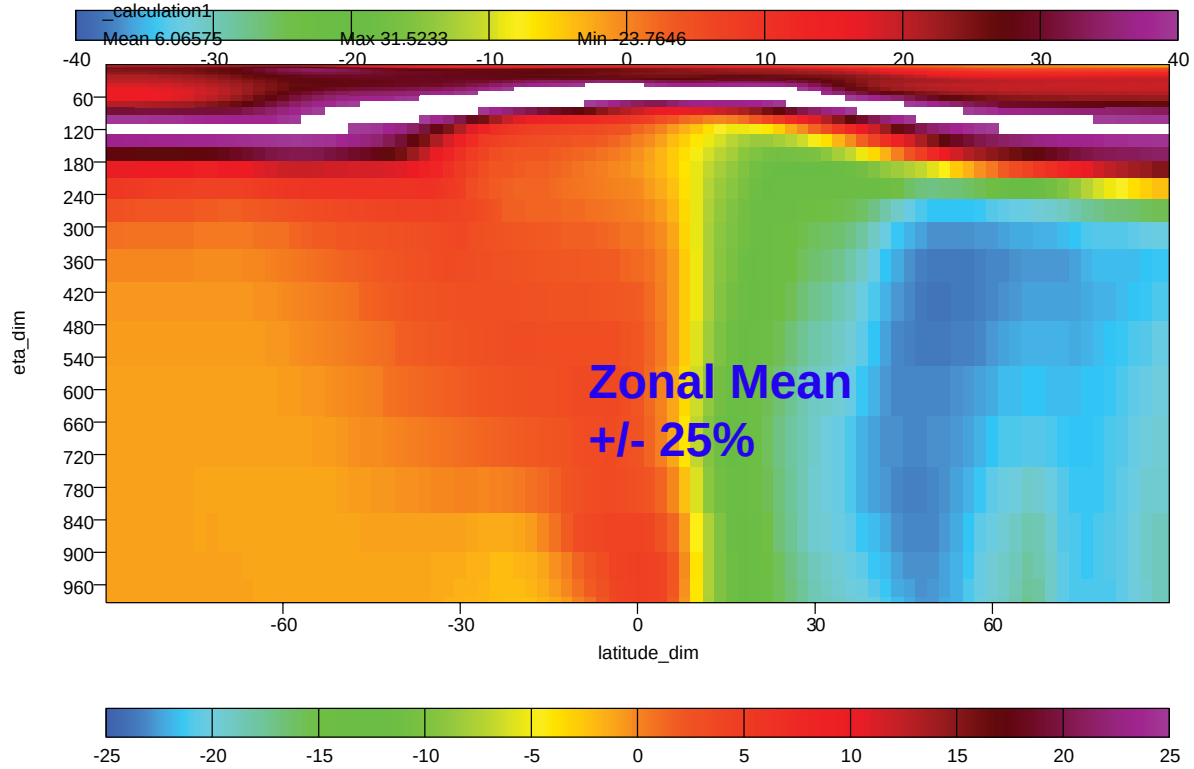
**Aura3 = 6.8-6.9 y**
**Aura4 = 6.3-6.7 y**

**Mean tropospheric OH**
**(0.83-0.86x10$^{6}$ molec/cm$^{3}$)**

**Aura3 = 0.83-0.86**
**Aura4 = 0.83-0.87**

**July %Difference**
**(Aura4-Aura3)/Aura3*100.**

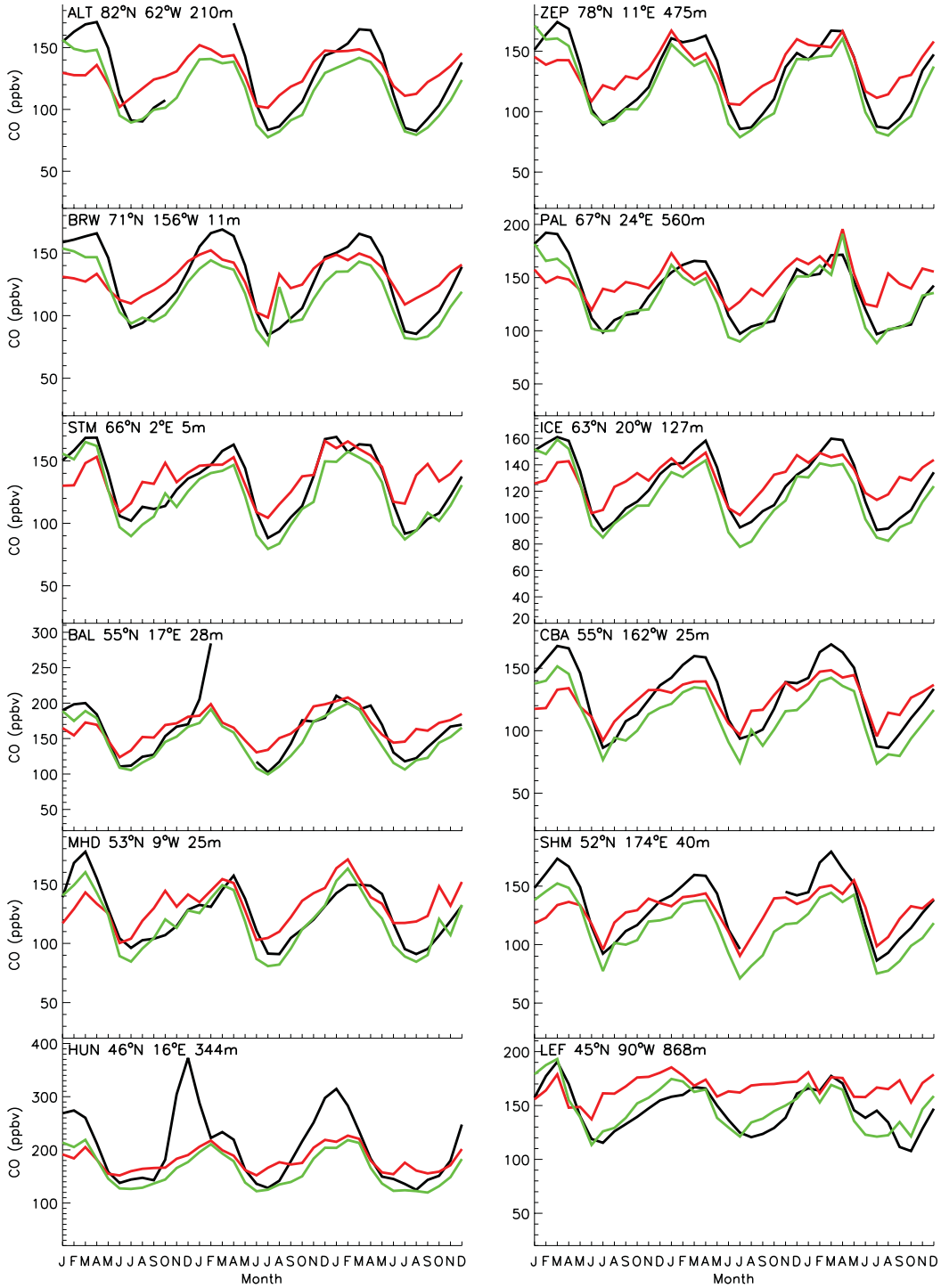


**GMD CO**

**Aura3**

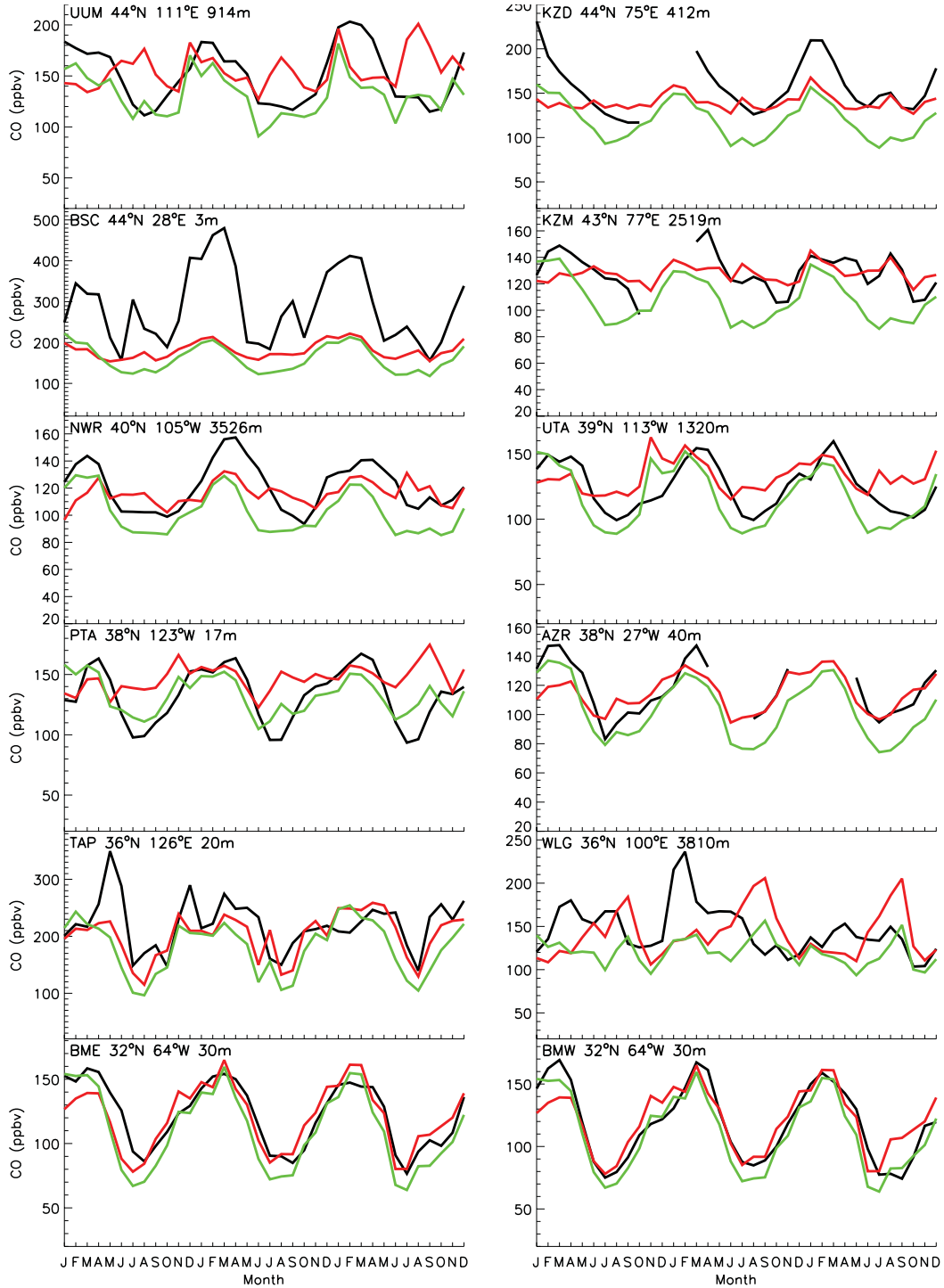
**Aura4**



# GMD CO

**Aura3**

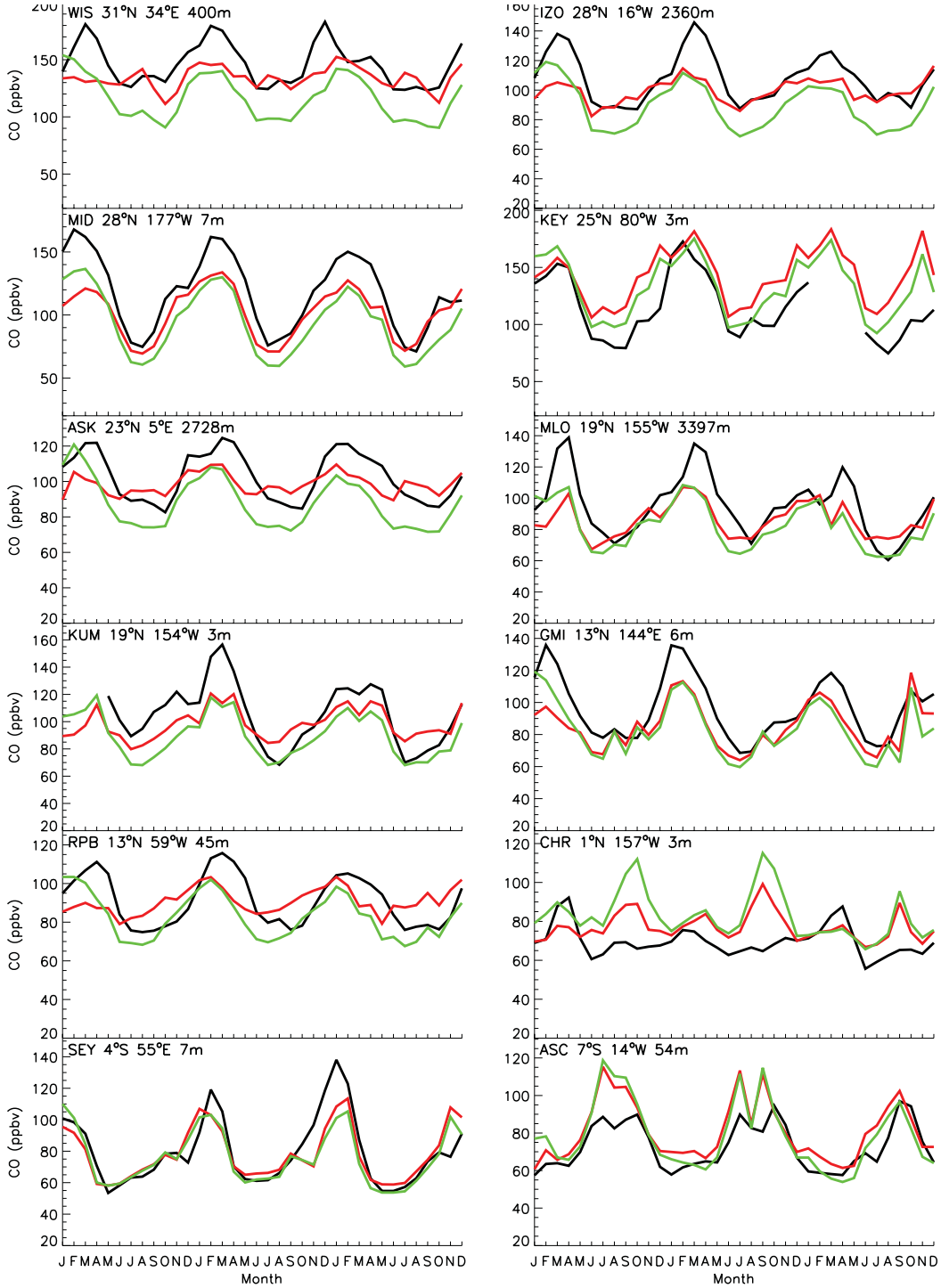
**Aura4**



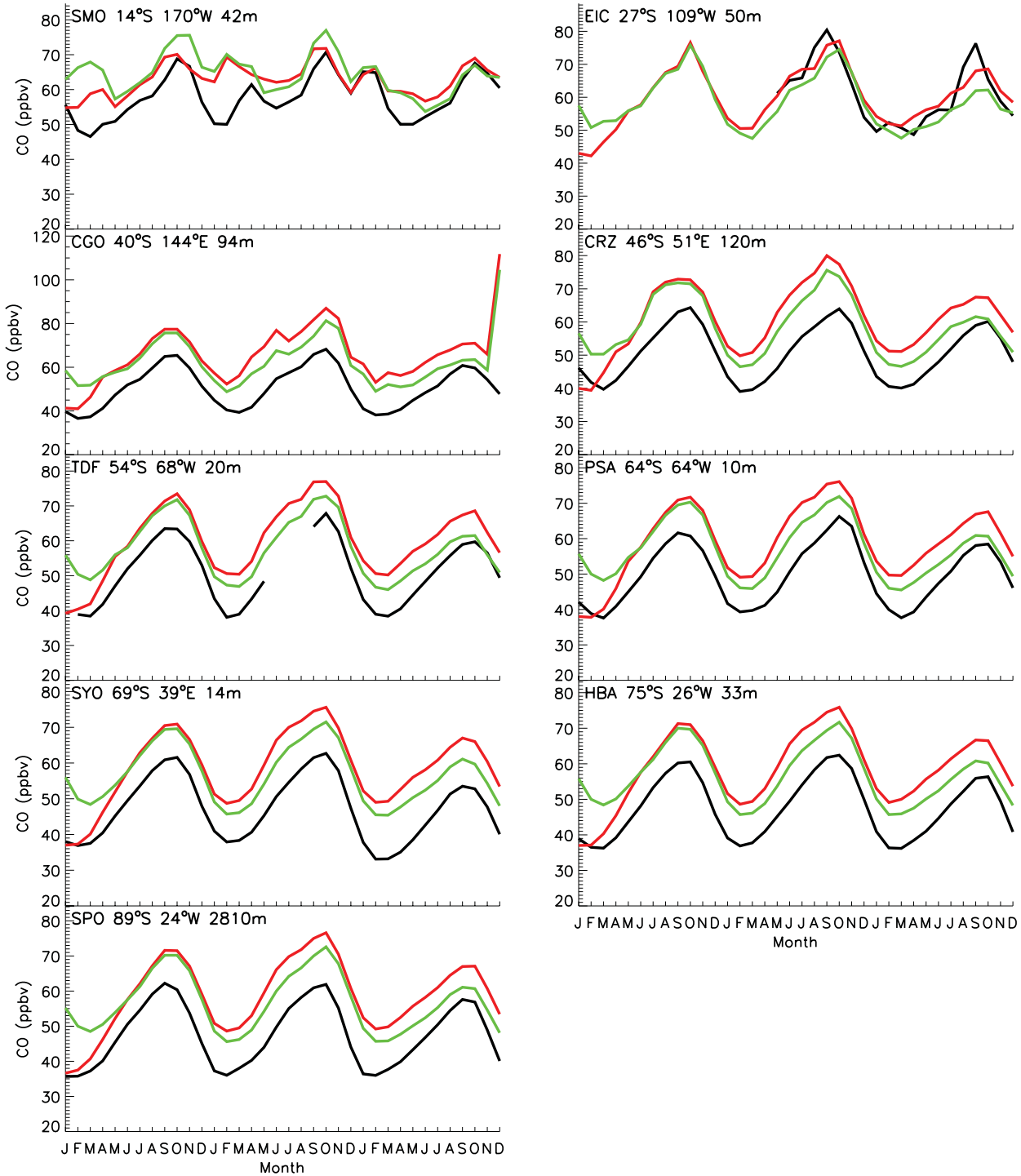
# GMD CO

**Aura3**

**Aura4**



**GMD CO**

**Aura3**

**Aura4**