



Figure 1: Time series of CO mole fractions at Mt. Kenya GAW station. **a)** Daily-resolution continuously measured CO mole fraction (Picarro) at Mt. Kenya GAW is represented by black dots. The CO data was retrieved from the WMO's-WDCGG database covering 2002- 2021. Different instrumentations were used over time, but similar instrumental calibration, quality control, and assurance protocols were applied. Flask-based measurements by NOAA at the station are presented in purple symbols, while flask samples during our 2021 campaign are shown in red symbols and were in good agreement with the online measurements, as shown in SI Figure S4. **b)** Variations in CO mole fractions for the year 2021. The prevailing typical weather conditions are indicated. **c)** Annual averaged CO mixing ratios. The boxes represent the 25th and 75th quantiles, and the black line represents the median value. The bottom/top whiskers are the minimum and maximum values, respectively, while diamonds represent the outliers. **d)** Inter-annual cycles of monthly averaged CO mole fractions (coloured lines represent individual years).

Supplementary Tables

Table S1: Sample details and stable isotope composition for 2021 campaign. Ambient air samples were collected at Mt. Kenya GAW station.

Date	Sampling Time	CO (ppb)	$\delta^{13}\text{C}$ (%o V-PDB)	$\delta^{18}\text{O}$ (%o V-SMOW)
2021-08-10	Night-time	93	-29.4	6.5
2021-08-11	Night-time	91	-31.2	3.3
2021-08-12	Night-time	126	-29.2	8.9
2021-08-13	Night-time	84	-30.7	4.0
2021-08-14	Night-time	93	-30.5	5.0
2021-08-15	Night-time	110	-29.5	6.9
2021-08-16	Night-time	112	-29.8	7.7
2021-08-17	Night-time	99	-31.5	4.0
2021-08-18	Night-time	58	-31.0	2.6
2021-08-19	Night-time	103	-29.1	7.4
2021-08-20	Night-time	111	-29.2	8.3
2021-08-21	Night-time	108	-28.0	7.1
2021-08-22	Night-time	98	-29.3	8.3
2021-08-23	Night-time	64	-30.0	3.4
2021-08-24	Night-time	89	-30.4	7.7
2021-08-25	Night-time	83	-30.3	6.1
2021-08-26	Night-time	82	-30.6	5.8
2021-08-27	Night-time	130	-29.4	9.8
2021-08-28	Night-time	131	-29.1	9.7
2021-08-29	Night-time	148	-28.6	9.9
2021-08-12	Day time	92	-30.4	5.2
2021-08-16	Day time	98	-30.5	5.7
2021-08-22	Day time	99	-29.1	7.7
2021-08-24	Day time	75	-30.4	5.7
2021-08-27	Day time	93	-29.6	7.7
2021-08-29	Day time	101	-30.0	7.2

Table S2: Sample details and stable isotope composition for 2021 campaign. Ambient air samples were collected in Nairobi.

Date	Sampling Time	CO (ppb)	$\delta^{13}\text{C}$ (‰ V-PDB)	$\delta^{18}\text{O}$ (‰ V-SMOW)
2021-08-10	Day time	277	-28.4	16.2
2021-08-12	Day time	539	-27.6	19.7
2021-08-14	Day time	583	-27.5	19.6
2021-08-16	Day time	557	-27.2	21.0
2021-08-18	Day time	356	-28.3	16.9
2021-08-20	Day time	265	-28.0	16.2
2021-08-22	Day time	250	-28.7	16.7
2021-08-24	Day time	263	-27.8	17.3
2021-08-26	Day time	194	-28.3	14.0

Table S3: Sample details and stable isotope composition for 1996/97 campaigns. Ambient air samples were collected on Mt. Kenya.

Date	Duration	CO (ppb)	$\delta^{13}\text{C}$ (V-PDB)	$\delta^{18}\text{O}$ (V-SMOW)
1996-07-29	Day time	157.0	-27.71	6.79
1996-07-30	Day time	197.2	-26.90	10.33
1996-07-31	Day time	169.6	-27.19	8.33
1996-08-01	Day time	365.1	-29.00	14.88
1996-08-20	Day time	140.9	-27.99	5.89
1996-08-20	Day time	135.4	-27.88	6.42
1996-09-25	Day time	193.5	-26.62	6.23
1996-09-25	Day time	200.1	-26.58	6.35
1997-01-10	Day time	121.4	-27.71	4.22
1997-01-10	Day time	120.1	-27.83	3.83
1997-02-06	Day time	144.4	-27.02	4.67
1997-02-06	Day time	139.2	-27.15	4.46
1997-09-10	Day time	123.70	-28.37	3.74
1997-09-10	Day time	135.40	-28.47	5.61