Supplemental Figures

Table S1. Differences of CH_4 mixing ratios (nmol mol^{-1}) between the sites.

Pairs of Sites	Difference in Means	P-Value
Barrow–Alert	10.6	0.02
Barrow–Summit	18.8	0.00
Barrow–Tiksi	−14.9	0.00
Tiksi–Alert	25.5	0.00
Tiksi–Summit	33.7	0.00
Alert–Summit	8.2	0.10

Table S2. Summary of monthly temperature correlations between 1986–2014 with a significance level of 0.05. Bold indicates statistical significance.

Month	Correlation	P-Value
January	0.19	0.33
February	−0.04	0.85
March	0.16	0.43
April	0.18	0.36
May	0.09	0.63
June	0.22	0.26
July	0.16	0.41
August	**0.37**	**0.05**
September	**0.44**	**0.02**
October	**0.50**	**0.01**
November	**0.56**	**0.00**
December	0.28	0.14

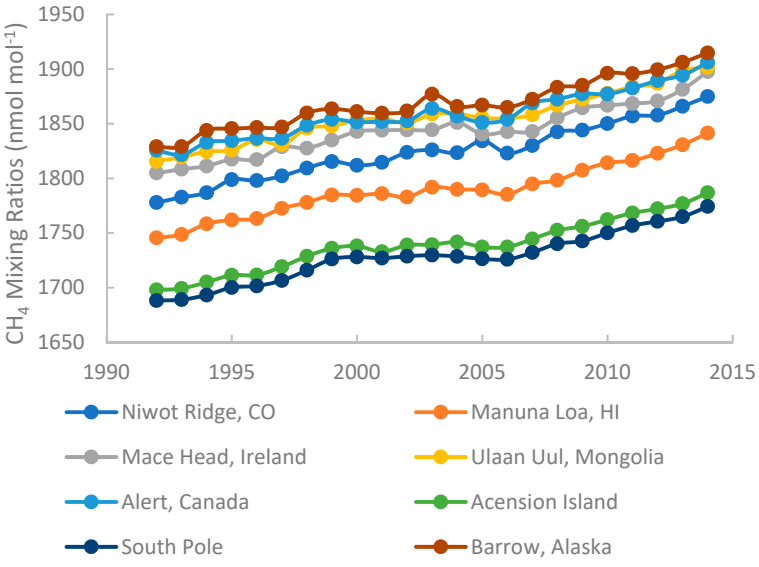

Figure S1. Time series of CH_4 mixing ratios from 10 different sites worldwide.

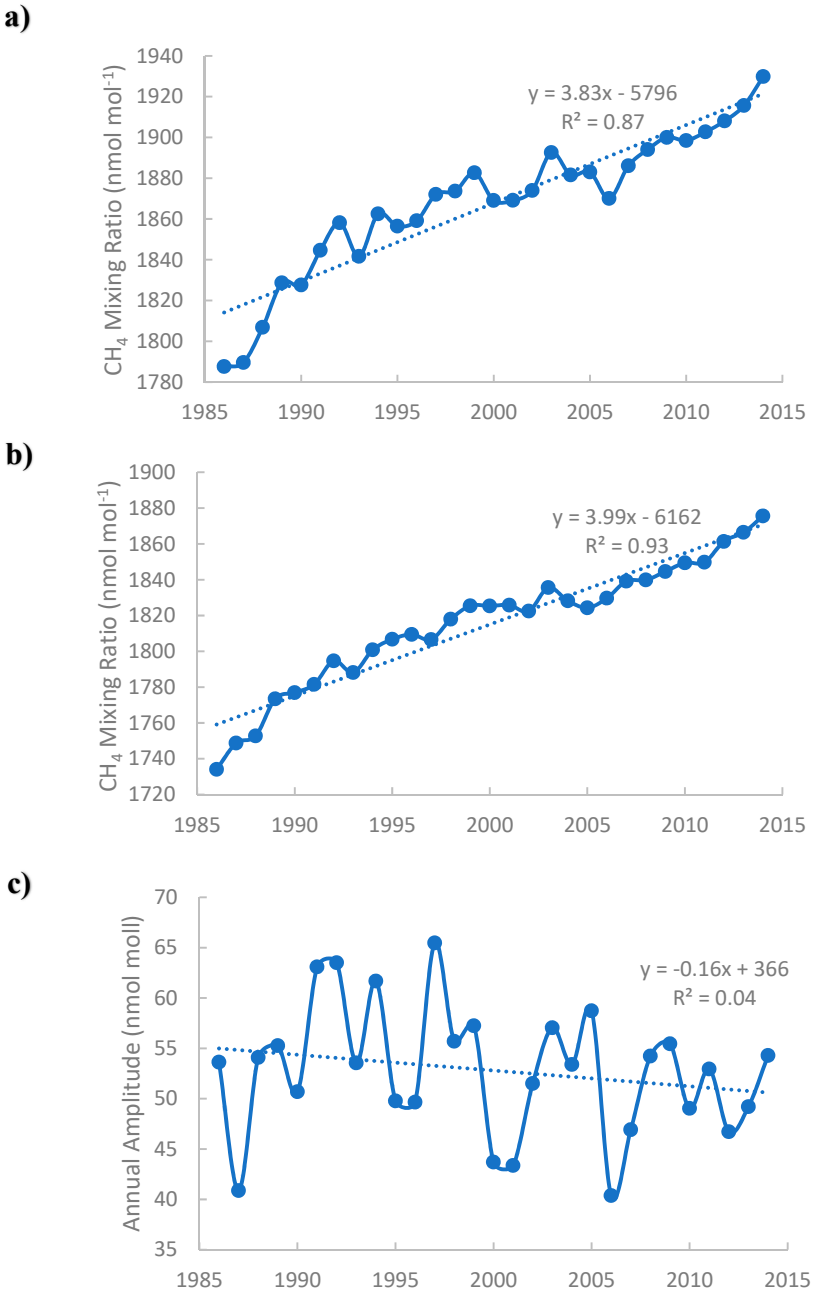

Figure S2. Annual maximums (**a**) and minimums (**b**) as well as annual amplitude (**c**) of CH_4 mixing ratios in Alert.

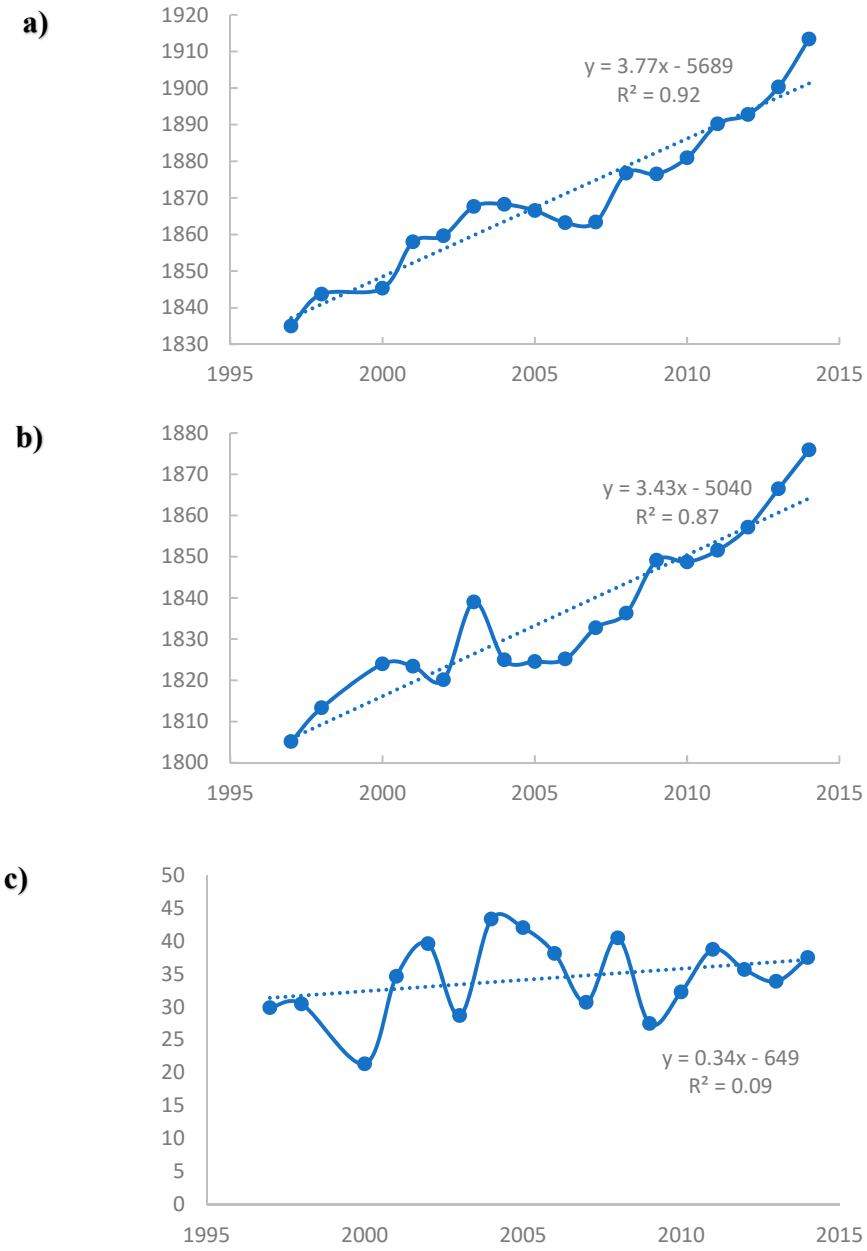

Figure S3. Annual maximums (**a**) and minimums (**b**) as well as annual amplitude (**c**) of CH_4 mixing ratios in Summit.

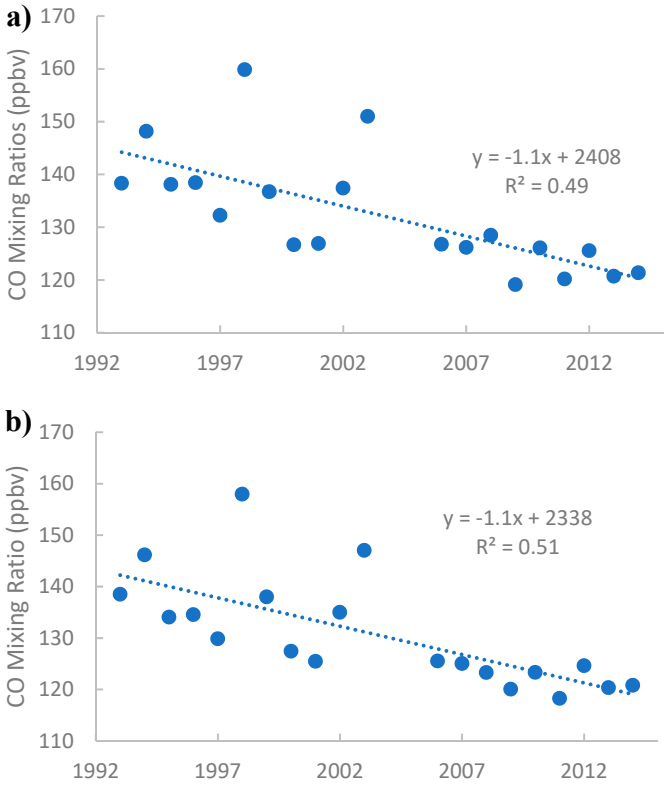

Figure S4. Time series of annual mean mixing ratios of CO for (**a**) Barrow and (**b**) Alert. .

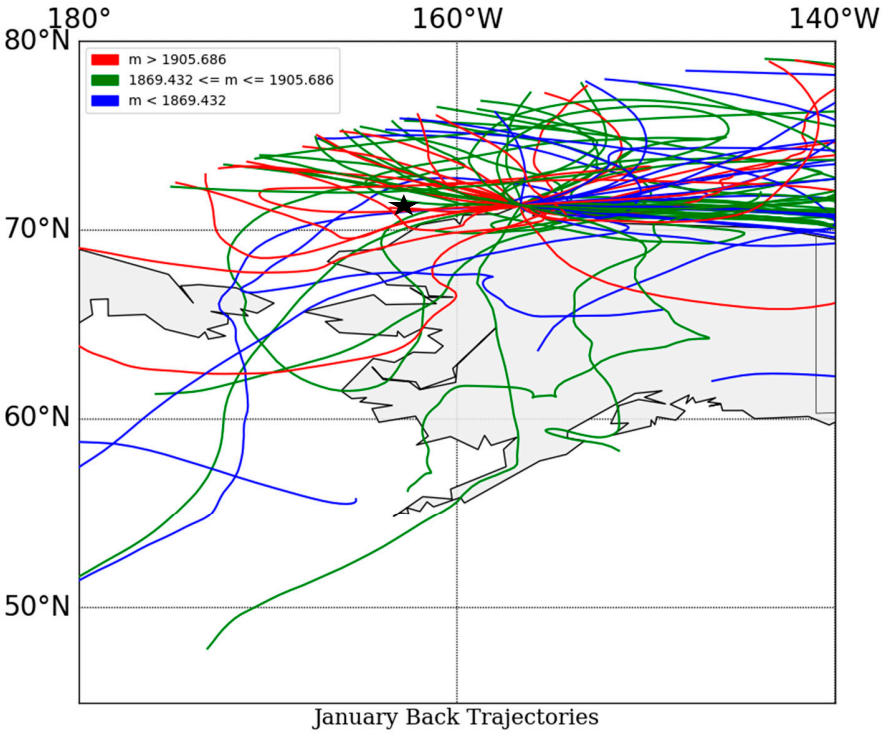

Figure S5. Individual trajectories for the month January between 1992–2012, with their corresponding CH_4 mixing ratios, in Barrow. Blue represents CH_4 mixing ratios below the 25th percentile of mixing ratios, green represents between the 25th and 75th percentile of mixing ratios, red represents greater than the 75th percentile mixing ratios.