Figure legends

Figure 1: Map showing all data used in the analysis, coded by variable. Variables are plotted individually in Fig. S1.

Figure 2: Latitudinal trends in forest autotropic carbon flux. Plotted are linear models, all of which were significant (p≤0.05) and had AIC values within 2.0 of the best model (for two fluxes, logarithmic fits were marginally better; Table S2). Sample sizes are available in Table 2 and *R2* values for linear models are available in Table S2. Each panel shows major C fluxes together with component fluxes. Also plotted are predicted trends in the major C fluxes based on the sum of component fluxes. 95% confidence intervals are plotted for the major flux for comparison with predicted trends. In (d), which shows three belowground fluxes, the major flux, total belowground carbon flux, has insufficient data (n=9) to support a regression.

Figure 3: Interactive effects of mean annual temperature and precipitation on annual forest carbon fluxes. For visualization purposes, data points are grouped into bins of 0 - 1000, 1001 - 2000, 2001 - 3000, and >3000mm mean annual precipitation, and lines of best fit models are plotted for mean annual precipitation values of 500, 1500, 2500, and 3500mm. Significance is defined as p≤0.05. Sample sizes are available in Table 2 and *R2* values are available in Table S3.

Figure 4: Plots of carbon fluxes against (a) mean annual temperature; (b) mean annual precipitation; (c) potential evapotranspiration, (d) vapour pressure deficit; (e) temperature seasonality; (f) length of growing season. For visualization purposes, data for each flux was rescaled with a mean of 0 and standard deviation of 1. Lines of best fit are plotted according to the best model selected during analysis. All regressions are significant (p≤0.05). Sample sizes are available in Table 2 and *R2* values are available in Table S2.