

Climate Change workshop #7

How is the concentration of Carbon in the atmosphere changing?

By Dr. Richard Gammon, UW Seattle

(recorded by Dr. E.J. Zita, Evergreen St. College, Olympia)

Global annual emission of carbon is about 6 billion tons per year. How many moles is that?

$$\frac{6 \times 10^9 \text{ tons/yr} \left| \frac{10^6 \text{ grams}}{\text{ton}} \right|}{12 \text{ g/mole}} = 5 \times 10^{14} \text{ moles/yr}$$

Number of moles of C in the atmosphere $\sim 2 \times 10^{20}$ moles

$$\begin{aligned} \text{Annual increase of atmospheric CO}_2 &= \\ \frac{\text{moles CO}_2 / \text{yr}}{\text{moles atmosphere}} &= \frac{5 \times 10^{14} \text{ moles/yr}}{2 \times 10^{20} \text{ moles}} \sim 2.5 \times 10^{-6} / \text{yr} = 2.5 \text{ ppm/yr} \end{aligned}$$

Actually it's not quite so fast because half goes into oceans and forests, but they can't keep absorbing at their current rate for long.