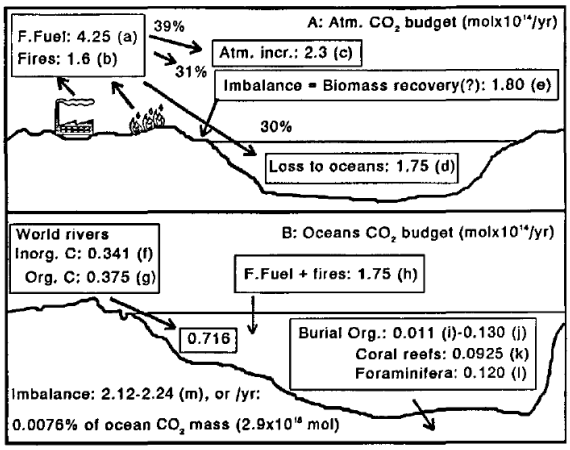
Figure 4



A: CO_2 budget of atmosphere in mol × 10^{14}/yr. Data (see also Tab. 3B) from: a) Quay et al. *(1992): b) Houghton* et al. *(1990); c) Keeling and Shertz (1992); d) Quay* et al. *(1992). The budget results in an imbalance (e) of 1.80 × 10^{14} mol CO_2/yr, which can be partly explained by biomass recovery, in particular for savannah fires, which are the major contributors (Artaxo* et al., *1993).*

B: CO_2 exchange in mol 10^{14}/yr, between the atmosphere, rivers and the world oceans. Data (see also Tab. 2 and 3 B) are from (f) Sarmiento and Sundquist (1992), (g) for the load of organic matter from rivers, the same value is taken as given in Figure 14 h. The atmosphere-derived CO_2 entering the oceans is taken from Quay et al. *(1992), who give an average net annual oceanic CO_2 uptake of 1.75 × 10^{14} mol/yr of carbon for 4.25 × 10^{14} mol/yr of carbon released as CO_2 into the atmosphere by fossil-fuel burning, see also (a). Other authors (Etcheto and Merlivat, 1988) give a lower CO_2 (into the oceans) between 0.74 and 1.15 × 10^{14} mol CO_2/yr. The value of 1.75 × 10^{14} mol/yr is however in the range as summarized by Sarmiento and Sundquist (1992) who give a model estimate of 1.4-2.3 × 10^{14} mol/yr (i and j). The amounts of buried organic matter are also the same as those shown in Figure 14, the lowest given by Broecker (1970), the highest by Sarmiento and Sundquist (1992). (k) Coral reef formation is estimated (Kinsey and Hopley, 1991) at 0.0925 × 10^{14} mol/yr. (l) The net sedimentation of $CaCO_3$ by foraminifera, also taken for the complete oceans, is estimated at 0.120 x10^{14} mol/yr (Broecker and Peng, 1987). (m) The imbalance is 2.17 × 10^{14} mol/yr, which is only 0.0076 ± 0.0004 % of the total CO_2 mass in the oceans, being 2.9 × 10^{18} mol (Tab. 3 B).*