

THE ATMOSPHERIC MISSING LINK - WHERE HAS
ALL OF THE CO² GONE? ^{MAS}

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Being able to accurately estimate the global carbon budget is critical to the estimation of future environmental conditions. Comparing known CO² sources and sinks, modelers have recorded an annual net imbalance of approximately 2.2 gigatons of carbon. It was hypothesized that the oceans were sequestering the "missing" carbon, but testing has resulted in the rejection of that hypothesis. It is assumed that the potential sink must be large and have global distribution to account for such a massive quantity of carbon. After the oceans, the next largest potential sink appears to be the soil. This research analyzed soil samples from a Kansas State University experimental site that had been established for the purpose of examining the effects of elevated CO² levels on soil carbon content. Treatments examined were ambient and two-times ambient CO² levels. Particulate Organic Matter (POM) was isolated from whole soil samples using a dispersing agent and mild mechanical disruption of aggregate structure. The POM was then treated with a series of density extractions to isolate distinct phases of the degradation continuum. Dry weight examination revealed increasing POM recovered with exposure to elevated CO². SEM revealed that the density extraction procedure successfully isolated distinct POM fractions. Carbon analysis revealed that soil carbon levels increased significantly under enhanced CO² conditions - Rough calculations indicate the deposition of an additional 0.2 kg C/g whole soil per m² to a depth of 5 cm.