
Chapter 1: Historical Overview of Climate Change Science

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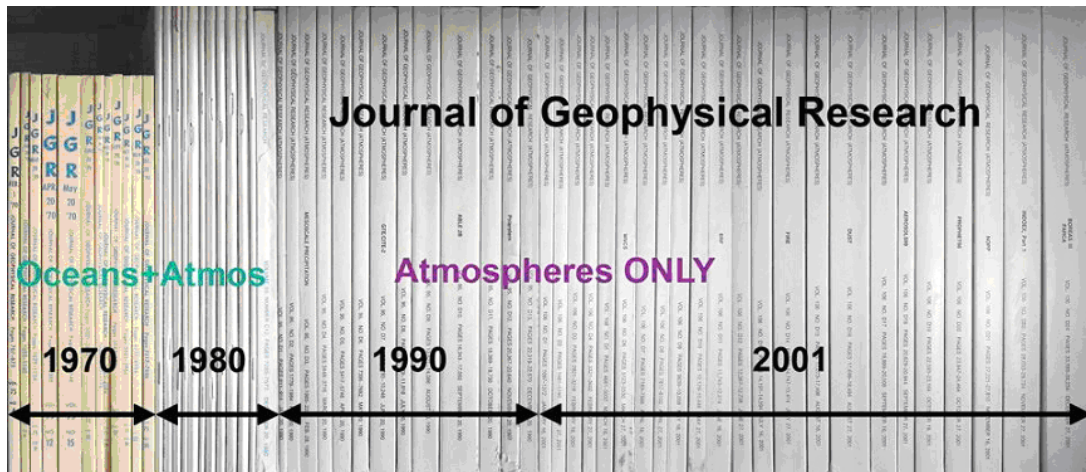
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Notes: This is the TSU compiled version

1 **Figures**
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 6 **Figure 1.1.** Atmospheric and oceanic research over the past four decades has expanded greatly and provided
 7 a better understanding of the Earth system and climate change, knowledge upon which the IPCC climate
 8 assessments are based. Shown in this figure are the issues published in four years of a prominent scientific
 9 journal, the *Journal of Geophysical Research*. The increase in research publications illustrated here is
 10 especially dramatic, because in 1970 and 1980, the topics of oceans and atmospheres were combined in one
 11 section of the journal, but in 1990 and 2001 these had been split into two sections, and only the atmospheres
 12 section is shown.

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The Development of Climate models, Past, Present and Future



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Figure 1.2. The increasing complexity of climate models (Source: TAR)

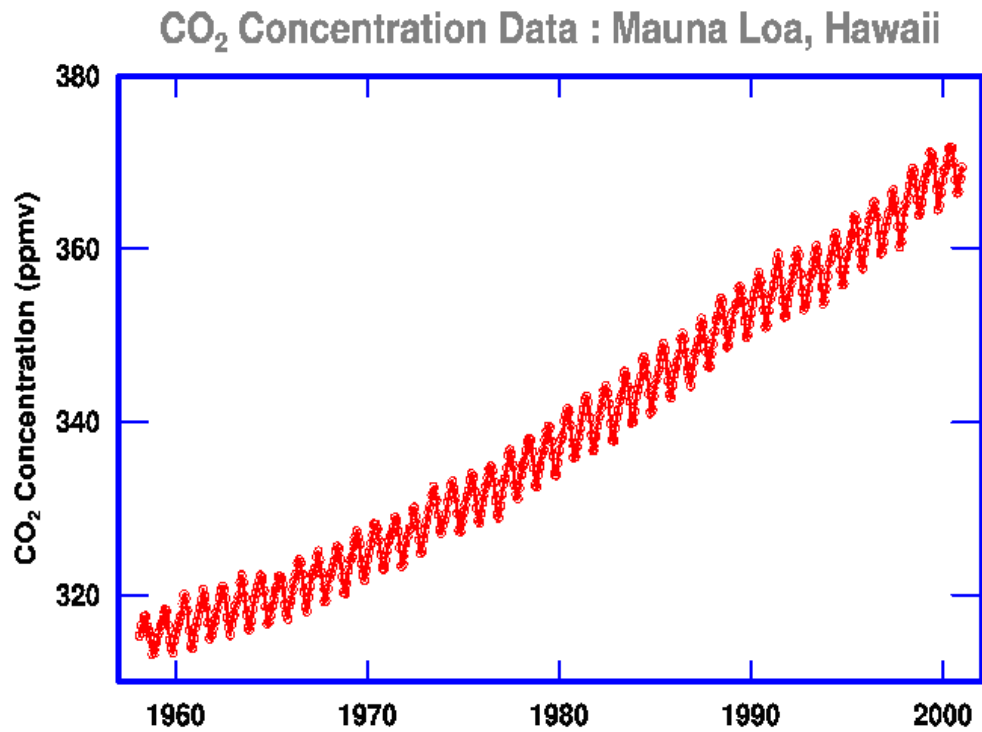
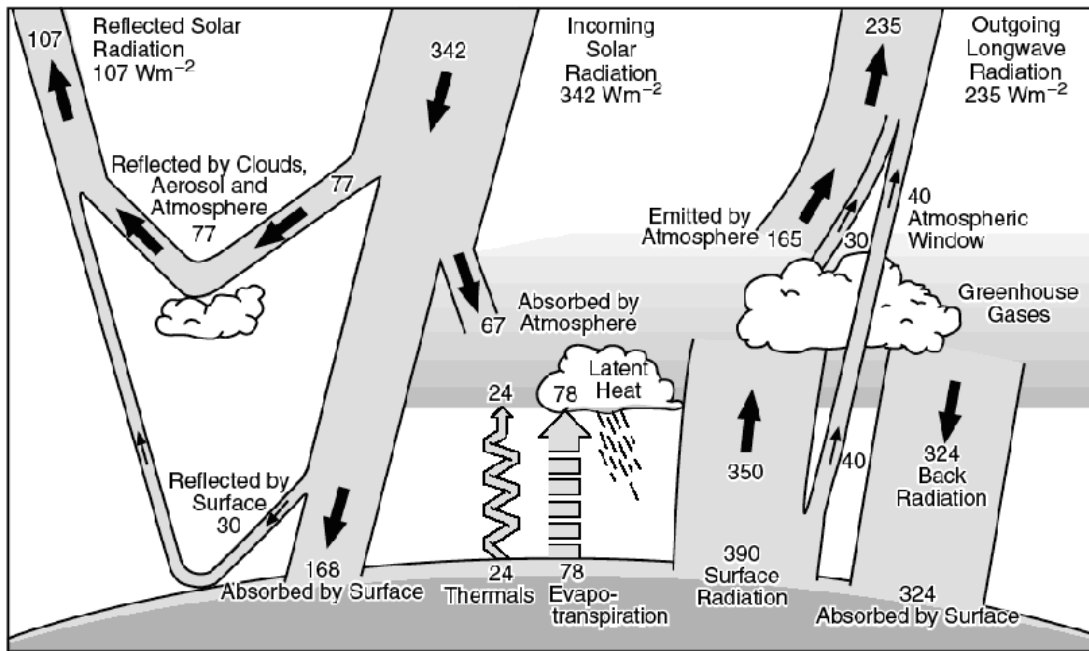
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Figure 1.3. The Keeling curve, showing the rise in atmospheric carbon dioxide due to fossil fuel combustion and other human activities, illustrates dramatically that humanity is changing the chemical composition of the global atmosphere and thus adding to the natural greenhouse effect.

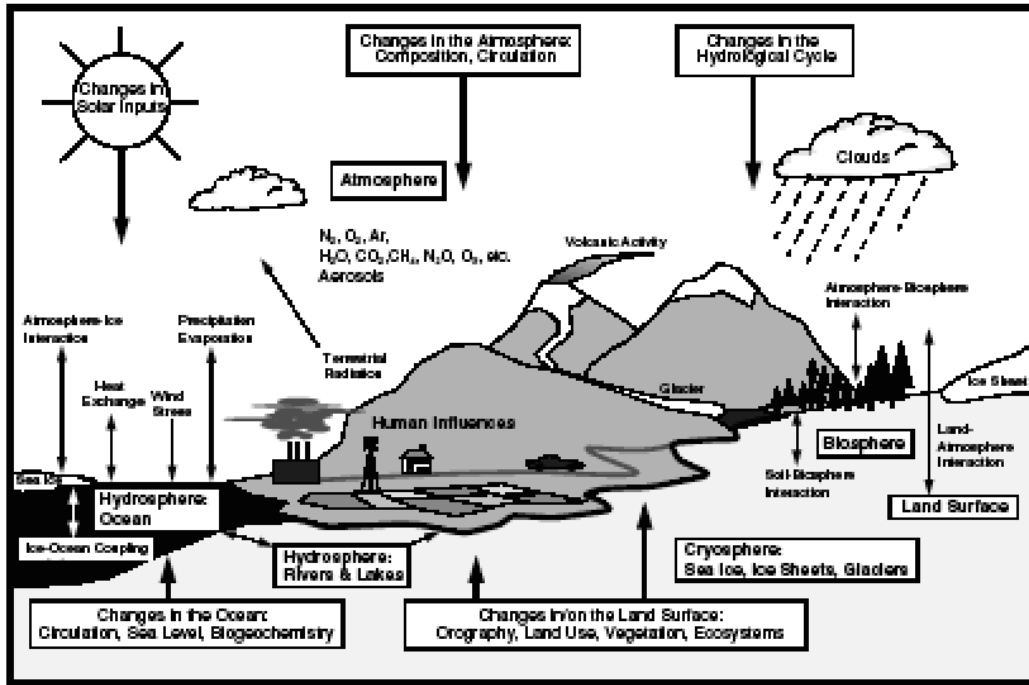
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Question 1.1, Figure 1. The Earth's annual and global mean energy balance. Source: Kiehl & Trenberth, 1997.

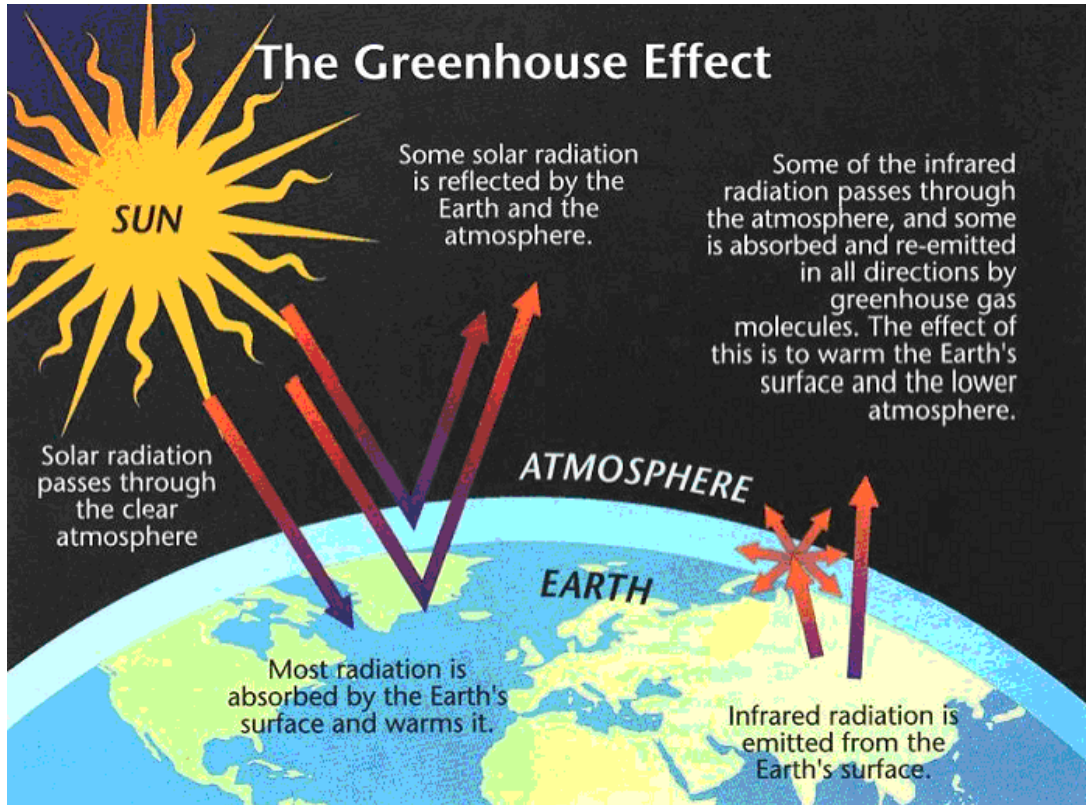
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Question 1.2, Figure 1. Schematic view of the components of the global climate system, their processes and interactions

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Question 1.3, Figure 1. An idealized conceptual model of the natural greenhouse effect.