

CATASTROPHIC CLIMATIC CHANGES PRODUCED BY A LARGE IMPACT: THE K/T CHICXULUB  
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The Chicxulub impact on the Yucatan Peninsula **produced** catastrophic changes in the atmospheric chemistry and climate 65 million years ago. The explosive release into the stratosphere of about 100 billion megatons each of sulfur and water vapor from the 3 kilometer thick evaporates platform sequence was calculated using a 2-D hydrocode model. Radiative transfer calculations, coupled with models of SO<sub>2</sub> oxidation and diffusion, and sulfuric acid aerosol coagulation and sedimentation, show that solar transmission dropped to 10-20% of normal for the first year and about 50% for the next 8-10 years. Previous research has shown that silicate dust and soot produced by the impact caused dramatic land surface cooling within weeks, but cooling beyond a couple of years was minimal. Our research indicates that the sulfuric acid aerosols caused a decade of near freezing conditions. Our model also predicts a massive release of CO<sub>2</sub>. However, our climate model shows only minor greenhouse warming. More recent geological investigations in Belize have identified deposits of carbonate condensates (CaMgCO<sub>3</sub>) from the vapor plume. Such condensates removed large amounts of CO<sub>2</sub> from the plume, thereby further reducing the warming effect of CO<sub>2</sub>. We propose that this cooling event (of about 15 to 30 degrees Centigrade) was a major cause of the K/T' mass extinction.