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# Modelling Antarctic ice sheets under greenhouse Earth conditions.

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The polar regions during the Cretaceous period have traditionally been reconstructed as being warm and ice-free. However, recent investigations of eustatic sea-level changes that occurred during this period suggest a glacial origin, the most plausible cause being the growth and decay of moderate sized ice-sheets on Antarctica. This project aims to investigate this hypothesis by exploring the form of possible Antarctic ice-sheets during the Maastrichtian stage (70.5–65.5 Ma) of the Late Cretaceous. We created a GIS based palaeoclimatic proxy database to provide both boundary conditions and evaluation data for a suite of HadCM3 GCM predicted Maastrichtian climates that reflect changes in atmospheric $CO_2$levels, orbital configuration and geography. We then use these evaluated climates to drive an ice-sheet model. First, we present a detailed overview of the methods and objectives of this project. We then conclude by detailing some of the initial results of this work, in particular, the analysis of the predicted palaeoclimates and ice sheets for varying atmospheric $CO_2$levels.