GLOBAL MODELLING WITHIN THE CSIRO DIVISION OF ATMOSPHERIC RESEARCH

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1. INTRODUCTION

Numerical modelling is now used very extensively in science and technology to investigate an enormous range of problems, from biology to aerodynamics. One of the most active areas of modelling has always been the climatic sciences. Currently very complex models have been developed for the atmosphere and oceans, which are being increasingly applied to critical problems such as long range weather forecasting, studies of the greenhouse effect, drought research and prediction, and problems associated with atmospheric composition. Apart from the practical utility of such research, a principal reason for numerical modelling developing so rapidly in the climatic area is the existence of well-defined mathematical equations, which control the large scale motions in the atmosphere and oceans. These equations can be manipulated into forms which permit them to be solved on computers, thereby allowing climatic simulations and predictions to be made. Of course, the accuracy of the models is limited in practice by our lack of knowledge about many physical processes in the atmosphere and particularly the oceans. Problem areas include clouds and their interactions, exchange processes between the atmosphere and oceans, and the mechanisms governing the changes in many oceanic properties.

The formulation and description of such models will not be considered here, but relevant details can be obtained from GARP[1] or CHANG[2].