CO_2 concentration at a compound annual rate of 1 % has been studied. We have focused on topics relevant to these aspects in this report. Other topics and model performance will be presented in detail elsewhere.

Time integration over 70 years has been performed using flux adjustments in the surface energy and water fluxes, by which time the CO_2 concentration will have doubled. Not only the sea ice volume but also its extent, distribution and thickness remained stable throughout the time integration, and a systematic sea ice drift such as that reported in Cubasch *et al.* (1994) was not found in the present experiment. However, interdecadal sea ice variability was evident in both the C and G runs. This low frequency variability was coupled with the constantly increasing CO_2 radiative forcing, accelerating the warming after year 50. The speed of CO_2-induced warming at high latitudes in the Northern Hemisphere in the present experiment was slower than that obtained by the GFDL group (Stouffer *et al.*, 1989) in which leads in the sea ice were not modeled, suggesting that the negative feedback effect of leads on sea ice change may be playing an important role in determining the speed of warming.

ENSO-like phenomena have been simulated in both the C and G runs. Analysis of SST revealed that the most dominant air-sea coupled mode in the model is very close to what has been observed. The most notable feature is a wedge like pattern in the central Pacific, with an opposite polarity in the north-western and south-western mid-Pacific. This mode shows interannual variations in the Pacific with a dominant period of about 6 years, which is close to the typical time scale of El Niño events. The mode also shows variations at interdecadal time scales, with implications for predictability over a few decades. Although no definite indication is found that the ENSO is affected by the CO_2-induced warming, the present study suggests that the low-frequency variability interacts with CO_2-induced climate changes. The sea ice variability presented in this report may be indicative of some kind of global low-frequency variability that is mostly readily manifested by the sea ice.

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