Southern Hemisphere circulation changes have previously been shown to be affected by changes in stratospheric ozone. In this study we examine model output from the WCRP CMIP3 for trends in precipitation and evaporation in the 20th and 21st centuries to assess whether stratospheric ozone influences Southern Hemisphere hydrology and extreme precipitation. Nineteen models are used, of which ten incorporate ozone depletion (recovery) in the 20th (21st) century, whilst nine simply prescribe climatological ozone in both past and future climates. Trends in seasonal-mean precipitation are found to dominate overall changes in precipitation minus evaporation, as trends in evaporation are relatively weak. For the 20th century, models with ozone depletion show a significant increase (decrease) in summer precipitation over 55-70S (40-50S) compared to models without ozone depletion. For the 21st century, models without ozone recovery show significantly larger changes in summer precipitation in these regions compared to models with ozone recovery. These findings are consistent with those of previous studies examining atmospheric circulation changes associated with the Antarctic ozone hole. It is further found that stratospheric ozone does not significantly effect precipitation intensity, but rather the frequency of precipitation events. Differences in precipitation frequencies were observed only over the summer season and matched trends found in mean precipitation, indicating that an increase in mean precipitation over the Southern Ocean corresponds to an increase in the number of wet-days. Implications of this result to Southern Hemisphere surface climate and Southern Ocean circulation changes are discussed and comparison with observations and model bias made.