

5A

Variability in Regional Modeling of Climate Change

5A.1 INTRODUCTION

Appendix 5-A provides additional detail on the variability in regional modeling of climate change. The following sections of the San Joaquin County Background Report reference this appendix:

- Effects of Climate Change and Adaptation (Chapter 5, Climate Change)

5A.2 VARIABILITY IN REGIONAL MODELING OF CLIMATE CHANGE

Much of the available trend data, modeling, and projections related to climate change are on a global scale. Projecting impacts of climate change often relies on general circulation models (GCMs), which develop large-scale scenarios of changing climate parameters, usually comparing scenarios with different concentrations of GHGs in the atmosphere. This information is typically at too coarse a scale to make accurate regional assessments. As a result, more effort has recently been put into reducing the scale and increasing the resolution of climate models through various techniques such as “downscaling” or integrating regional models into the global models (Kiparsky and Gleick 2005, Roos 2005, DWR 2006). However, the level of uncertainty related to regional climate change is generally higher than that related to global projections because downscaling and similar activities add uncertainty.

Variability in the results of climate change modeling is based in large part on which global climate model is used, what inputs are selected for the model (world population increases and GHG emissions), and how the model is downscaled to provide region-specific data. For example, in DWR’s report *Progress on Incorporating Climate Change into Management of California’s Water Resources, Technical Memorandum Report* (DWR 2006), four scenarios projecting regional climate change were selected, consisting of combinations of two different global climate models and two different emissions scenarios. These four scenarios provide temperature results ranging from weak warming to relatively strong warming, and precipitation results ranging from modest reductions to weak increases (DWR 2006).

It should be remembered that results of climate change modeling, particularly for regional models, are too coarse to be precise, quantified predictions. There is a significant amount of uncertainty about the magnitude of climate change that will occur during this century. It is unlikely that this level of uncertainty will diminish significantly in the foreseeable future (Dettinger 2005a). Therefore, effects on the environment anticipated under various climate change models should be considered as general projections of potential future conditions, with actual environmental effects likely falling within the range of results provided by a variety of model outputs.