Climate Change and Food Security

Adapting Agriculture to a Warmer World
## Contents

**Part I**

1. **Introduction** ................................................................. 3  
   David Lobell and Marshall Burke

2. **Climate Effects on Food Security: An Overview** ....................... 13  
   Marshall Burke and David Lobell

3. **Climate Models and Their Projections of Future Changes** .......... 31  
   Claudia Tebaldi and Reto Knutti

**Part II**

4. **Crop Response to Climate: Ecophysiological Models** ............. 59  
   Jeffrey W. White and Gerrit Hoogenboom

5. **Crop Responses to Climate: Time-Series Models** ................. 85  
   David Lobell

6. **Crop Responses to Climate and Weather: Cross-Section and Panel Models** ......................................................... 99  
   Wolfram Schlenker

7. **Direct Effects of Rising Atmospheric Carbon Dioxide and Ozone on Crop Yields** ...................................................... 109  
   Elizabeth A. Ainsworth and Justin M. McGrath

**Part III**

8. **Food Security and Adaptation to Climate Change: What Do We Know?** ................................................................. 133  
   Marshall Burke and David Lobell
9 Breeding Strategies to Adapt Crops to a Changing Climate ............... 155
   R.M. Trethowan, M.A. Turner, and T.M. Chattha

Part IV

10 Global and Regional Assessments ........................................ 177
   David Lobell and Marshall Burke

11 Where Do We Go from Here? ............................................. 193
   David Lobell and Marshall Burke

Index ...................................................................................... 197