CONTENTS

List of Figures ix
List of Tables xvi
List of Contributors xx
Preface xxii
Acknowledgements xxii

INTRODUCTION
A Note on Statistics and Units of Measurement 5

PART 1: THE ANATOMY OF REGIONAL CLIMATES IN THE BRITISH ISLES

CHAPTER 1: THE ANATOMY OF REGIONAL CLIMATES IN THE BRITISH ISLES
Julian Mayes and Dennis Wheeler 9

Introduction 9
The Three-Dimensional Atmosphere 9
The Atmosphere's Energy and Moisture Sources 10
Global-scale Circulations 13
Upper Tropospheric Circulations 14
Synoptic-scale Climatic Elements 15
Local Air Circulations 16
Atmospheric Interactions with the Land Surfaces 18
Atmosphere and Environment around the British Isles 20
The Regional Influence of the Atmospheric Circulation around the British Isles 23
Characteristics of Airflow Types around the British Isles 25
Conclusion 43
References 43
PART 2: THE CHARACTER OF REGIONAL CLIMATES ACROSS THE BRITISH ISLES

CHAPTER 2: SOUTH-WEST ENGLAND AND THE CHANNEL ISLANDS
Allen Perry 47
Introduction 47
Temperature 49
Precipitation 53
Wind 59
Sunshine 62
Visibility and Fog 63
Conclusion 64
References 65

CHAPTER 3: SOUTH-EAST ENGLAND
Julian Mayes 67
Introduction 67
Temperature 68
Precipitation 73
Wind 78
Sunshine 82
Fog 85
Conclusion 85
References 86

CHAPTER 4: EASTERN ENGLAND
Julian Mayes and Geoffrey Sutton 89
Introduction 89
Temperature 91
Precipitation 96
Wind 104
Sunshine 107
Fog 108
Conclusion 109
References 110

CHAPTER 5: THE MIDLANDS
John Kings and Brian Giles 111
Introduction 111
Temperature 114
Precipitation 117
Wind 124
Sunshine 126
Fog 127
<table>
<thead>
<tr>
<th>Chapter Title</th>
<th>Author</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conclusion</td>
<td></td>
<td>129</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td>129</td>
</tr>
<tr>
<td>CHAPTER 6: WALES</td>
<td>Graham Sumner</td>
<td>131</td>
</tr>
<tr>
<td>Introduction</td>
<td></td>
<td>131</td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td>133</td>
</tr>
<tr>
<td>Precipitation</td>
<td></td>
<td>139</td>
</tr>
<tr>
<td>Wind</td>
<td></td>
<td>149</td>
</tr>
<tr>
<td>Sunshine and Fog</td>
<td></td>
<td>152</td>
</tr>
<tr>
<td>Conclusion</td>
<td></td>
<td>154</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td>156</td>
</tr>
<tr>
<td>CHAPTER 7: NORTH-EAST ENGLAND AND YORKSHIRE</td>
<td>Dennis Wheeler</td>
<td>158</td>
</tr>
<tr>
<td>Introduction</td>
<td></td>
<td>158</td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td>160</td>
</tr>
<tr>
<td>Precipitation</td>
<td></td>
<td>164</td>
</tr>
<tr>
<td>Wind</td>
<td></td>
<td>171</td>
</tr>
<tr>
<td>Sunshine</td>
<td></td>
<td>175</td>
</tr>
<tr>
<td>Fogs and Frets</td>
<td></td>
<td>176</td>
</tr>
<tr>
<td>Conclusion</td>
<td></td>
<td>179</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td>179</td>
</tr>
<tr>
<td>CHAPTER 8: NORTH-WEST ENGLAND AND THE ISLE OF MAN</td>
<td>Lance Tufnell</td>
<td>181</td>
</tr>
<tr>
<td>Introduction</td>
<td></td>
<td>181</td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td>181</td>
</tr>
<tr>
<td>Precipitation</td>
<td></td>
<td>187</td>
</tr>
<tr>
<td>Wind</td>
<td></td>
<td>195</td>
</tr>
<tr>
<td>Visibility, Air Pollution and Sunshine</td>
<td></td>
<td>197</td>
</tr>
<tr>
<td>Conclusion</td>
<td></td>
<td>202</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td>202</td>
</tr>
<tr>
<td>CHAPTER 9: CENTRAL AND SOUTHERN SCOTLAND</td>
<td>John Harrison</td>
<td>205</td>
</tr>
<tr>
<td>Introduction</td>
<td></td>
<td>207</td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td>207</td>
</tr>
<tr>
<td>Precipitation</td>
<td></td>
<td>212</td>
</tr>
<tr>
<td>Wind</td>
<td></td>
<td>218</td>
</tr>
<tr>
<td>Sunshine</td>
<td></td>
<td>222</td>
</tr>
<tr>
<td>Visibility and Fog</td>
<td></td>
<td>223</td>
</tr>
<tr>
<td>Conclusion</td>
<td></td>
<td>225</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td>226</td>
</tr>
</tbody>
</table>
CHAPTER 10: THE HIGHLANDS AND ISLANDS OF SCOTLAND
Marjory Roy 228
Introduction 228
Temperature 231
Precipitation 239
Wind 245
Sunshine 247
Fog and Visibility 249
Conclusion 252
References 252

CHAPTER 11: IRELAND
John Sweeney 254
Introduction 254
Temperature 256
Precipitation 261
Wind 270
Sunshine and Cloud 274
Conclusion 274
References 275

PART 3: REGIONAL PERSPECTIVES ON CLIMATIC VARIABILITY AND CHANGE

CHAPTER 12: REGIONAL PERSPECTIVES ON CLIMATIC VARIABILITY AND CHANGE
Julian Mayes and Dennis Wheeler 279
Introduction 279
Extra-terrestrial Controls on Global Climate 281
Atmospheric Composition and Climate Variability 285
Climatic Changes in Historical Time 286
The Medieval Warm Period 289
The Little Ice Age 291
Evidence from Instrumental Observations after the 1850s 298
Regional Weather Patterns and the Atmospheric Circulation 309
The Geographical Distribution of Regional Weather Anomalies 315
Climate and Climatic Regions in the Future 318
Regional Climates and Landscape 324
Conclusion 327
References 328

Glossary of Terms 332
General Index 335
Index of Places 339