# CONTENTS

Preface xi Acknowledgments xv Foreword by Professor Kerry Emanuel, MIT xix How to Use This Book xxi Introduction: An Incoherent Truth xxv

# PART I : WRITING AND PUBLISHING SCIENTIFIC RESEARCH PAPERS

- 1 The Process of Publishing Scientific Papers 3
- 1.1 Submission 3
- 1.2 Editors and reviewers 5
- 1.3 Technical editing, copy editing, and page proofs 8
- 2 Should You Publish Your Paper? Questions to Ask Before You Begin Writing 11
- 2.1 Is the science publishable? 12
- 2.2 Who is the audience, and what attracts them to your paper? 14
- 2.3 What is the target journal? 15

## **3** Writing an Effective Title 21

- 3.1 Characteristics of an effective title 21
- 3.2 Structuring the title 22
- 3.3 Multipart papers 25
- 3.4 Examples 26

Schultz, David M. Eloquent science 2009

# 4 The Structure of a Scientific Paper 29

- 4.1 Parts of a scientific document 30
- 4.2 Nonlinear reading 30
- 4.3 Cover page 31
- 4.4 Abstract 32
- 4.5 Keywords 33
- 4.6 Introduction 33
- 4.7 Literature synthesis 37
- 4.8 Data and methods 40
- 4.9 Results 41
- 4.10 Discussion 42
- 4.11 Conclusion, conclusions, or summary 43
- 4.12 Acknowledgments 45
- 4.13 Appendices 46
- 4.14 References 46
- 4.15 Alternative organizations to your manuscript 46

# 5 The Motivation to Write 49

- 5.1 The importance of attitude 50
- 5.2 Reducing the height of the hurdle 51
- 5.3 Preparing the writing environment 52
- 5.4 Opening the floodgates 53

# 6 Brainstorm, Outline, and First Draft 55

- 6.1 Brainstorming 56
- 6.2 Outlining 56
- 6.3 Writing the first draft 57

# 7 Accessible Scientific Writing 59

- 7.1 The differences between literary and scientific writing 59
- 7.2 Making writing more accessible 60
- 7.3 Structuring logical arguments 61
- 7.4 Writing is like forecasting 63

# 8 Constructing Effective Paragraphs 65

- 8.1 Coherence within paragraphs 66
- 8.2 Examples of coherence 68
  - 8.2.1 Repetition 69
  - 8.2.2 Enumeration 69
  - 8.2.3 Transition 70

- 8.3 Coherence between paragraphs 71
- 8.4 Length and structure of paragraphs 74

# 9 Constructing Effective Sentences 75

- 9.1 Active voice versus passive voice 76
- 9.2 Subject-verb distance 80
- 9.3 Verb tense 81
- 9.4 Parallel structure 82
- 9.5 Comparisons 83
- 9.6 Negatives 85
- 9.7 Misplaced modifiers 85
- 9.8 Rhythm and aesthetics 86

## 10 Using Effective Words and Phrases 87

- 10.1 Concision 88
- 10.2 Precision 90
  - 10.2.1 Denotation versus connotation 90
  - 10.2.2 Jargon 91
  - 10.2.3 Unclear pronouns 92
  - 10.2.4 Choosing the best words 93
  - 10.2.5 Braggadocio and superlatives 96
- 10.3 Proper form 98
  - 10.3.1 Abbreviations and acronyms 98
  - 10.3.2 Numbers and units 99
  - 10.3.3 Adjective-noun agreement 99
- 10.4 Eliminating bias 100
  - 10.4.1 Gender bias 100
  - 10.4.2 Geographical bias 101
  - 10.4.3 Cultural bias 102
- 10.5 Minimizing misinterpretations 102

## 11 Figures, Tables, and Equations 103

- 11.1 Design 108
- 11.2 Size 110
- 11.3 Aesthetics 110
- 11.4 Consistency 112
- 11.5 Annotation 113
- 11.6 Grayscaling and color 115
- 11.7 Common types of figures 118
  - 11.7.1 Line graphs 118
  - 11.7.2 Scatterplots 119

- 11.7.3 Bar charts 122
- 11.7.4 Tukey box-and-whisker plots 126
- 11.7.5 Horizontal maps 127
- 11.7.6 Vertical cross sections 130
- 11.7.7 Thermodynamic diagrams 131
- 11.7.8 Hovmöller diagrams 131
- 11.7.9 Pie charts 132
- 11.7.10 Small multiples 132
- 11.7.11 Instrumentation figures 133
- 11.7.12 Schematic figures and conceptual models 133
- 11.8 Figures from other sources 134
- 11.9 Tables 134
- 11.10 Captions for figures and tables 137
- 11.11 Discussing figures and tables in the text 137
- 11.12 Oversimplified comparisons 138
- 11.13 Direct versus indirect citation 139
- 11.14 Numbering figures and tables 140
- 11.15 Placing figures and tables in the manuscript 141
- 11.16 Equations and chemical reactions 141

#### 12 Citations and References 143

- 12.1 Why cite the literature? 143
- 12.2 How to cite the literature 144
- 12.3 What literature to cite and when to cite it 146
- 12.4 Who to cite 147
- 12.5 Where to cite the literature 148
- 12.6 Quotations 149
- 12.7 Citation syntax 151
- 12.8 Reference lists 153
- 12.9 Citing digital materials 154
- 12.10 A final admonition 155

#### 13 Editing and Finishing Up 157

- 13.1 The process of revision 157
- 13.2 Losing your way 159
- 13.3 Condensing text through précis 160
- 13.4 An example of the editing process 161
- 13.5 Nearing a final version of the manuscript 167
- 13.6 Minding the little things 168
- 13.7 Receiving feedback 170
- 13.8 The need for concision 171

- 13.9 The right length 172
- 13.10 The final edits 173

## 14 Authorship and Its Responsibilities 175

- 14.1 Determining authorship 176
- 14.2 Determining authorship order 177
- 14.3 Obligations of authors 180
- 14.4 Obligations of corresponding authors 181

# 15 Scientific Ethics and Misconduct 183

- 15.1 Fabrication and falsification 184
- 15.2 Plagiarism 186
- 15.3 Self-plagiarism 188
- 15.4 Consequences of misconduct 189

# 16 Guidance for English as a Second Language Authors and Their Coauthors 191

- 16.1 Cultural differences require direct communication 192
- 16.2 Common weaknesses in manuscripts written by ESL authors 193
- 16.3 Using the literature as your writing coach 195
- 16.4 Translating your native language or writing in English? 197
- 16.5 Seeking help 198
- 16.6 Collaborating and coauthoring with ESL authors 199

## 17 Page Proofs, Publication, and Life Thereafter 203

- 17.1 Page proofs 203
- 17.2 Publication 205
- 17.3 Marketing your publication 206

# 18 Methods and Approaches to Writing for the Atmospheric Sciences 209

- 18.1 Classification schemes 210
- 18.2 Automated versus manual techniques 210
- 18.3 Picking thresholds 212
- 18.4 Research approaches for atmospheric science 213
  - 18.4.1 Case studies: Observations and models 213
  - 18.4.2 Model sensitivity studies 216
  - 18.4.3 Climatologies 218
  - 18.4.4 Synoptic composites 218
  - 18.4.5 Forecast methods 219
  - 18.4.6 Other approaches 221

#### PART II : PARTICIPATING IN PEER REVIEW

#### **19 Editors and Peer Review** 225

#### 20 Writing a Review 229

- 20.1 Should you agree to do the review? 230
- 20.2 Obligations of reviewers 231
- 20.3 How to approach a review 231
- 20.4 Making the decision: Revise or reject? 234
- 20.5 Writing the review 235
- 20.6 To be or not to be anonymous 239
- 20.7 Providing comments to others 239

#### 21 Responding to Reviews 243

- 21.1 Making revisions and writing the response 243
- 21.2 Responding to specific comments 246
- 21.3 Divergent reviews 247
- 21.4 Dealing with rejection 248

# PART III : PREPARING AND DELIVERING SCIENTIFIC PRESENTATIONS

#### 22 How Scientific Meetings Work 253

- 22.1 How meetings are organized 254
- 22.2 Picking the right meetings to attend 255
- 22.3 How to be a good audience member 257

#### 23 The Abstract and Extended Abstract 259

- 23.1 Characteristics of a conference abstract 260
- 23.2 Writing and submitting a conference abstract 262
- 23.3 Oral or poster presentation? 262
- 23.4 The extended abstract 263

#### 24 Accessible Oral Presentations 265

- 24.1 How writing differs from speaking, and what that means for your presentation 265
- 24.2 Focus your message 267
- 24.3 Know why you are giving the talk 268
- 24.4 Address your audience 268
- 24.5 Deliver the content at the right baud rate 269
- 24.6 Create a synergy between your words and your visuals 269

- 24.7 Understand the distractions to your audience 270
- 24.8 Address everyone within a diverse audience 271

# 25 Constructing Effective Oral Presentations 273

- 25.1 Storyboard your presentation 274
- 25.2 Starting to construct your presentation 275
  - 25.2.1 First few slides 276
  - 25.2.2 Last few slides 277
- 25.3 Design attractive slides 278
- 25.4 Headlines are better than titles 279
- 25.5 Delete unnecessary words 282
- 25.6 Include relevant and clear graphics 284
- 25.7 Examples of how to improve slides 286
- 25.8 Use effective transitions 289

# 26 Delivering Compelling Oral Presentations 291

- 26.1 Rehearse to reduce anxiety 291
- 26.2 Prepare before the presentation 293
- 26.3 Deliver a strong opening 296
- 26.4 Keep the momentum going 297
- 26.5 Finish strong 297
- 26.6 Have a compelling delivery 297
- 26.7 Maintain eye contact 299
- 26.8 Watch the time! 299
- 26.9 Handouts should not duplicate your slides 300
- 26.10 Questions and answers 301

## **27 Potent Poster Presentations** 305

- 27.1 Two ways to design a poster 306
- 27.2 Content and layout 310
- 27.3 Putting it on paper 311
- 27.4 Assembling the poster 312
- 27.5 At the poster session 313
- 27.6 A vision 314

## 28 Challenges to Delivering Your Presentation 315

- 28.1 Managing the inconveniences of travel 315
- 28.2 Presenting in a foreign country 316
- 28.3 Combatting nervousness 317
- 28.4 Avoiding and managing illness 319
- 28.5 When things go wrong 319

## PART IV : COMMUNICATING THROUGHOUT YOUR CAREER

#### 29 Communication in the Workplace 323

- 29.1 Writing memoranda 323
- 29.2 Résumés versus curricula vita 324
- 29.3 Planning and running meetings 325
- 29.4 Working efficiently, working smarter 328

## **30** Communication with the Public and Media 329

- 30.1 Preparing for an interview 331
- 30.2 Interacting with the public 332

## **31 Furthering Your Journey** 335

- 31.1 Write more 335
- 31.2 Read more 337
- 31.3 Give more talks 337
- 31.4 Attend more talks 337
- 31.5 Develop a peer group 337
- 31.6 Incorporate communication skills in the classroom 339
- 31.7 Interact with mentors and colleagues 339
- 31.8 Volunteer 340
- 31.9 Develop your own style 340
- 31.10 Learn from your mistakes 340
- 31.11 Conclusion 341

# PART V : APPENDICES

A Commas, Hyphens, and Dashes 345

## B Commonly Misused Scientific Words and Expressions 351

Notes 367 For Further Reading 383 References 393 Index 407