Suggestions to Authors of the Reports of the United States Geological Survey

Seventh Edition

REVISED AND EDITED BY
WALLACE R. HANSEN

U.S. GOVERNMENT PRINTING OFFICE : 1991
Preface to the Seventh Edition

This SEVENTH EDITION of “Suggestions to Authors of the Reports of the United States Geological Survey” (STA) carries on a long tradition of guidance for writers, reviewers, editors, typists, and other persons helping prepare manuscripts within the Survey. With the advent of “desktop publishing” through the use of word processors and personal computers, moreover, many authors are becoming more involved in publication matters previously handled mostly by editors and typists. When the sixth edition of STA went out of print in 1984, its obsolescence in the light of rapid technological advances in earth science, and of changing publication techniques and requirements, convinced the Survey that a new, completely revised edition would be more appropriate than a reprinting of the old. STA 7 was thus conceived.

Most suggestions in STA 7 are stated in simple declarative sentences written in the third person. Many are offered in the second, and a few are even expressed in the imperative mood. Technical writing seldom has a place for either the second person or the imperative mood, but STA is not a technical report in the sense of a Survey Bulletin or Professional Paper, and its style accordingly is less constrained. Prospective authors should bear this difference in mind when preparing their reports. Many sentences in the paragraph you are now reading are phrased in the passive voice, and could scarcely be stated otherwise, but STA favors the strength and simplicity of the active voice for most expository writing. On the other hand, if the active voice turns the thrust of a sentence away from the true subject of discussion, as sometimes happens, the passive voice may be better. Written English grammar and style have evolved pragmatically through the years from writers’ efforts toward better communication. The same is true of STA, but much usage remains subjective. Some suggestions in STA, or in any style guide, are open to challenge, including such things as the use of the active voice versus the passive, subtle differences in the tenses of verbs, placements of adverbs, uses of relative pronouns and unattached participles, and the meanings of words. Even the use of commas, dashes, and colons can be subjective and arguable. So also can the organization of paragraphs and chapters and the preparation and content of illustrations. The whole point is that the Survey’s attitude toward writing does not support rigid adherence to mindless rules but, rather, urges reportorial flexibility to meet the needs of precision and clarity. Don’t be bound by STA, but ignore it at your peril; experience has shown that attention to the hints and guidelines expressed in STA will enhance the precision and clarity of nearly any Survey report, will yield better prepared manuscript copy, and will hasten processing for publication.
In today's times of technical specialization, and because of the breadth of the subject matter in STA, a book such as this can hardly be the work of one person. Much material that is still relevant has been taken almost verbatim from earlier editions. Many experts from the varied disciplines of earth science, moreover, have contributed their talents toward this book, and all of them have submitted new copy written in their own individual styles. Some stylistic variety therefore is inevitable and appropriate in STA, but to narrow the wide swings and achieve a certain syntactic unity, and to avoid possible inconsistencies, I have freely recast the individual contributions into a tighter idiosyncratic form. For this I apologize to all contributors who thereby may have been dismayed by any perceived highhandedness. The editing process itself introduced inevitable changes. I bear responsibility for the content and flavor of this edition of STA, but the following people helped immeasurably in its preparation, and in the following specialities: Julia E. H. Taylor, manuscript processing; Richard B. Taylor, mineral deposits; Clement T. Shearer, hazards warnings; Diane C. Schnabel, preparing manuscripts, formatting manuscripts and abstracts, preparing abstracts, proofing, instructions to typists, and many other details; David L. Schleicher, back up, ways and means; Anne C. Sangree, references and abbreviations; Edward T. Ruppel, geologic maps and sections; Charles L. Pillmore, plotters and personal computers; Donald J. Orth, geographic names; Harold E. Malde, technical review; Marjorie E. MacLachlan, geologic and stratigraphic names; Solomon M. Lang, metric system; Claire B. Davidson, aquifer nomenclature; Robert L. Laney, aquifer nomenclature; Donovan B. Kelly, news releases; Diane N. Jones, illustrations; Helen E. Hodgson, grammar, punctuation, and style; Jack E. Harrison, geologic maps and sections; Eugene R. Hampton, water resources reports; Elizabeth E. Good, tables and leaderwork; Joan J. Fitzpatrick, chemical, mineralogic, and petrologic terminology; J. Thomas Dutro, Jr., paleontologic terminology; Charlotte D. Densmore, manuscript keyboarding; Carol Waite Connor, poster sessions; Elizabeth D. Koozmin, page-size maps; Arlene B. Compher, graphics; Ann Coe Christiansen, maps and other illustrations; Marjorie J. Cater, manuscript keyboarding.

Several organizations kindly permitted STA to reproduce copyrighted or otherwise privately owned material. These groups are cited individually in the text; they include the American Association of Petroleum Geologists, King Features Syndicate, Inc., The Mineralogical Society of America, and United Media Enterprises, Inc. Robert C. McArtor provided camera-ready prints of material from the GPO Style Manual. Robert L. Bates allowed us to use selections from his column in “Geotimes.” The fine old steel engraving on page 42 of STA is taken from John Wesley Powell’s “Exploration of the Colorado River.” Many other people also contributed time and talent to STA, and the entire Survey owes them its gratitude.

W.R.H.
Contents

Foreword V
Preface to the seventh edition VII
Publications of the U.S. Geological Survey 1
The Survey publication process 4
Reference books 4
Atlases 4
Dictionaries 4
Editing and reviewing 4
English usage and grammar 4
Glossaries 5
Report writing 5
Style manuals 5
Other 5
Getting started 5
Before beginning the investigation 6
After completing the investigation 6
Choice of publication medium 6
The detailed outline 7
The first draft 7
Preparing and checking report for technical review 8
Technical review and revision 8
Editing 9
The author and the editor 9
Director's approval 10
Checking drafted illustrations 10
Galley and page proofs 10
Word processors: changing the way scientists write 10
Duties, ethics, and professional writing practices 12
Many contributors 12
Plagiarism eschewed 12
Acknowledgments 12
Dedication of U.S. Geological Survey publications 13
Credits and copyrights 13
Copyright transfer 14
Writing skills 14
Accuracy 14
Quotations 15
Promptness 15
Professional disagreements 15
Clarity 15
Duties, ethics, and professional writing practices—Continued

Name continuity 16
The scientist as volume editor 16
Hypothetical publication schedule 17

Form and content of the report 19
Title page 19
Title 19
Authorship 19
Affiliations 20
Statement of cooperation 20
Descriptive statement 20

Front matter 20
Foreword and preface 20
Contents, illustrations, and tables 21
Abstract for the written report 21
Abstracts for talks at scientific meetings 23

The text 24
The introduction 24
Body of the report 25
Headings 25
Footnotes 25
Concluding section 25
Reference list 25

The appendix 25
Index 26

Planning and management for water-resources reports 27
Principal organizational units 27
Reports prepared by the Water Resources Division 27
Importance of quality and timeliness 27
Planning and managing reports 30
Characteristics of a quality report 30
Quality assurance in the Water Resources Division 32
Colleague review—the cornerstone of quality assurance 32
District chiefs and research project managers 32
Reviewers 32
Regional evaluation 32
Headquarters evaluation 34

Author’s responsibilities after Director’s approval 35
Preparing manuscripts for printing 35
Releasing and distributing published reports 35

The Survey’s publication process summarized 36
Review and approval 36
Typical manuscript sequence 36

Stratigraphic nomenclature and description 43
Geologic Names Units and the Geologic Names Committee 43
Conformance to the code and modification to stratigraphic units 44
Temporal and related units 45
Stratigraphic nomenclature and description—Continued

Material units 45
  Formal names 45
    New names 46
    Previously defined names 46
    Modification of existing names 46
  Informal names 47
    Summary of formal versus informal usage 48
    Examples of informal nomenclature 48

Stratigraphic unit descriptions 49
  Text matter 49
    Explanations for geologic maps 49
      Correlation or sequence of map units 49
      Description of map units 49
      Symbols for map units 52
  Correlation charts and stratigraphic tables 52

Measured sections 54

Cross sections and stratigraphic columnar sections 55

Stratigraphic style and expression 55
  Abbreviations 55
    Capitalization of stratigraphic unit names 55

Divisions of geologic time 58
  Precambrian 58
    Archean and Proterozoic 60
    Phanerozoic 60
    Carboniferous 60
    Provincial land-mammal ages of the Tertiary 60
    Provincial series terms 60
    Neoglacial 60
    Holocene and recent 60
    Early, middle, and late versus lower, middle, and upper 60
    European stage terms 62

Expressions for degrees of doubt 62

Quotation marks 63

Undesirable expressions 63

Units of economic, local, subsurface, or regional interest 63

Publication of stratigraphic data 63
  Publication restrictions 63
  U.S. Geological Survey publications 63

Guidelines for naming aquifers 65

Aquifer nomenclature 65
  Aquifer 65
  Aquifer system 66
  Zone 66
  Confining unit 66
  Terms to avoid 67
Guidelines for naming aquifers—Continued

Definition of the hydrogeologic framework 67

Deriving aquifer names 69

Recommended sources for aquifer names 71

Lithologic names for aquifers 71

Rock-stratigraphic names for aquifers 71

Using rock-stratigraphic names for aquifers 74

Geographic names for aquifers 74

Nonrecommended sources for aquifer names 74

Time-stratigraphic names 74

Relative position 75

Alphanumeric designations 75

Depositional environment 75

Depth of occurrence 75

Acronyms 75

Hydrologic condition 75

Recommendations for naming confining units 76

General procedures, style, and expression 76

Redefining and renaming previously named aquifers 76

Format conventions for aquifer names 76

Examples of designating and naming aquifers 77

Geographic names 83

The U.S. Board on Geographic Names 83

Nature of geographic names 83

The Geographic Names Information System 83

Principles of national standardization 84

Spelling geographic names 84

Determining official names 84

Domestic names decisions 85

Geographic names policies 85

Proposing new names 85

Proposing name changes 86

Long and short forms of names 86

Parenthetical use of variant names 86

Unacceptable derogatory names 86

Diacritical marks in domestic names 86

Name duplication 86

Punctuation marks 87

Abbreviations and number names 87

Capitalization of geographic names 87

Names of regions, localities, and geographic features 88

Physical divisions of the United States 88

Geographic-geologic names 90

Foreign geographic names 90

Chemical terminology 91
Numbers 117
Significant figures 119
   Rounding off numbers 119
   Absolute and relative errors 120
   Arithmetic operations 120
   Misusing significant figures 121
The metric system 122
Suggestions as to expression 124
   Unity, coherence, and emphasis 124
Common grammatical problems 124
   Problems with sentence structure 124
      Sentence fragments 124
      Run-on sentences 125
   Lack of agreement between sentence elements 125
      Subject/verb disagreements 125
      Plural/singular verbs and singular/plural predicate nouns 125
      Pronoun disagreements 126
      Problems with collectives and their verbs 126
Eliminating indefinite antecedents 126
Modifiers 127
   Misplaced modifiers 127
   Dangling modifiers 128
   Other misplaced words and phrases 128
   Dangling non sequiturs 129
   Troublesome participles 129
Uncoordinated sentence elements 130
Incomplete comparisons 130
Problems with poorly chosen adverbs, prepositions, and infinitives 130
   Adverbs 130
   Prepositions 131
   Prepositions doubled up 131
   Infinitives 131
Effective punctuation 132
   The comma 132
   The semicolon 134
   The period 135
   The exclamation point 135
   The colon 136
   The dash 136
   Parentheses 137
   The hyphen 137
      In syllable breaks 137
      In unit modifiers 137
   Slash or virgule 139
   The apostrophe 139
   Brackets 139
   Points of ellipsis 139
   Quotation marks 140
Suggestions as to expression—Continued

Style 140
  Emphasis 140
    Position 140
    Order 141
    Voice 141
    Specific terms 141
    Italic 141
  Variety in sentence length and type 141
    Four types of sentences 141
    Active versus passive voice 142
    Passive voice and personal pronouns, first and third person 143
Enhancing clarity 143
  That, which, who, whom, and whose
    in restrictive and nonrestrictive clauses 143
  Parenthetical expressions 144
  Parallel construction 144
  Excessively long unit modifiers 146
  Split infinitives 146
  Terminal prepositions 147
  Repetition and synonyms 147
  Acronyms 147
  Ten steps toward clarity 147
  Conciseness 147
  Expletives 148
  Gunning’s fog index 148

Coherence in the report 149
  Topic sentences 149
  Paragraph organization 149
  Paragraph length 149
    Transitions and coherence 149

Coined verbs 150
  Abstract nouns in the subject of the sentence 151
  Forgetting your subject 152
  Modified subject misapplied 152
  Undesirable change in construction 152
  Undesirable alliteration 152
  Loose versus tight language 153
  Meaningless redundancies 153
  Prepositions in idiomatic expressions 153
  Foreign words 153
  Vogue words and trite phrases 153
  Stilted and showy language 154
  Care with metaphors and similes 154
  Pathetic fallacy 154
  Sexist pronouns 155
  Ellipsis 155
Suggestions as to expression—Continued

Choosing the right word 156

Preparing maps and other illustrations 184

Planning 184

Cost considerations 184
Planning maps 185
Base-map needs 185
Planning text figures 186
Image sizes 186

Special requirements 186

Maps 186

Contacts, faults, and fold axes 186
Lithologic patterns 187
Map explanations 187
Map symbols 187
Index maps 191
Mine maps 191

Cross sections 192

Exaggerated sections 194
Patterns and lines 194

Fence diagrams 194

Page-size maps 194
Initial decisions 194
Materials 195
Components of page-size geologic maps 195

Stratigraphic sections, lithologic

columnar sections, and well logs 197

Computer graphics 198

Photographs 198

Black-and-white prints 198
Color prints 199
Special requirements 199
Captions for photographs 199
Irrelevancies 202
Photographs on oversize plates and maps 202
Drawings from photographs 202
Fossil plates 202
Aerial photographs 202
Shaded-relief maps from photographs 202

Frontispieces 202

Cover art and other special artwork 202

Graphs and diagrams 203
Preparing graphs and diagrams for review 203
Combination graphs 208

Engineering drawings 209
Slides and viewgraphs 209
Preparing maps and other illustrations—Continued

Preparation of author copy 209
Titles and captions of illustrations 209
Use of abbreviations 210
Final check of maps and other illustrations before review 210
Technical review of author copy 211
Author response to technical review 212
Transmittal for approval and preparation 212
Review of map preparation plans after Director’s approval 213
Review of check prints after preparation for publication 213
Date and initial 213
Disposition of original illustrations, photographs, and reproducibles after publication 213

Field records and photographs 214
Permanent disposition 214
Photographic library 214
Field records library 215

Tables 216

Photogrammetry applied to earth science in the U.S. Geological Survey 223
History and development 223
The computer-assisted geologic mapping system 224
How to get aerial photographs 224

Guidelines for reviewing technical reports 226
Review practices 226
Treat manuscripts as privileged documents 226
Have a positive attitude 226
Be prompt 226
Document the review 226
Elements that affect the significance of the report 227
Prior publication 227
New facts; useful reviews 227
Intended readership 227
Timeliness 227
Adequacy of detail 227
Adequacy of approach 228
Results and their relative importance 228
Soundness and relevance of conclusions 228
Presentation 228
Title 228
Abstract 228
Introduction 228
Illustrations and tables 229
References 229
Acknowledgments 229
Organization 229
Clarity 229
Accuracy and consistency 229
Reviewing maps and cross sections 230
   Responsibilities 230
   Starting the review 230
   What to check next 230
      Reviewing the map units 230
      What to look for in the explanation 230
      Reviewing the map and cross sections 230
      General guidelines 230
      What to look for on the map and sections 231
Checklists for reviewing maps and sections 232
   Map logic 232
   Cross sections 232
   Other considerations 233
Preparing references for Survey reports 234
   Types of material cited 234
   References cited within the text 234
   Reference list (references cited) or bibliography 235
      How to list references 235
      Elements of a bibliographic citation 236
      Details of the citation 236
   Examples of cited publications 239
Posters for scientific meetings 242
   Planning the poster 242
      Scientific content 242
      Design 242
         Lettering, line weights, and color 243
         Computer printouts 245
         Text 245
      Mounting, packaging, and displaying 245
   The alternative poster 245
News releases 246
   Writing a news release 248
   Talking to the news media 248
   Letters to editors 248
Hazard warnings 249
   If you detect a geologic hazard 249
Formatting Survey manuscripts for review and editing 250
   Where to begin 250
   General guidelines for the entire manuscript 250
   Note for “New Publications of the U.S. Geological Survey” 251
   Front matter 251
   Title page 251
   Contents 251
   List of illustrations 252
   List of tables 252
   First page 252
Formatting Survey manuscripts for review and editing—Continued

Body of text 253

Figure and table references in text 254

Formatting illustrations and their titles (captions) 255
- Sample figure captions 256
- USGS Professional Paper and
  Techniques of Water-Resources Investigations 256
  USGS Bulletin, Circular, and Water-Supply Paper 256
  Short title 256

Formatting and typing tables 256
- Parts of a table 256
  Title 256
  Bracketed headnote 257
  Leaders 257
  Horizontal and vertical rules 257

Camera-ready text and tables 257

Guidelines 257
- Maximum, minimum, and ideal widths for
  camera-ready tables prepared for USGS publications 258

Equations 258

Measured sections 259

Disclaimers 260

References cited 261
- Reference list 261
  Unpublished information 262
  Reference citation in text 262
  Samples of references cited in typed text 262

Halftitle page 262

Appendixes 262

Formatting abstracts for scientific meetings 262

Checklists 263

Checklist for completed manuscript 263
- General guidelines 263
- Contents, lists of illustrations, and tables 263
- Footnotes 264
- Figure and table citations in text 264
- Illustrations and their captions 264
- Tables 264
- Equations 264
- Measured sections 264
- Disclaimers 264
- References 264
- Appendixes 264

Checklist for abstracts for scientific meetings 264
Proofreading 265
   Rationale and types 265
   When to proofread 265
   General techniques of proofreading 265
      Two-person proofreading 265
   How and where to make corrections 266
      Before typesetting 266
      After typesetting 266
      Common changes 266
         Insertion 266
         Deletion 266
         Substitution 266
         Transposition 267
         Punctuation 267
         Capital or lowercase letters 267
   Commonly used proofreader’s marks 267
      Sample galley proof 269
Exceptions to the GPO Style Manual 270
References 272
Index 275

Figures
1. Organization chart of the U.S. Geological Survey 28
2. A project and report review sheet used in the Water Resources Division 31
3. A project report schedule used in Districts of the Water Resources Division 33
4. Generalized diagram of the manuscript approval process in the Water Resources Division 34
5. Manuscript review and approval sheet (routing sheet) used in the Geologic Division 38
6. Manuscript review and approval sheet (routing sheet) used in the Water Resources Division 40
7. A simple explanation for a Geologic Quadrangle Map 50
8. A moderately complex correlation diagram from the explanation of a 1-degree x 2-degree geologic map 51
9. A correlation chart showing stages, ages, molluscan zones, and formations at selected localities 53
10. A stratigraphic table showing varied terminologies used for the same rocks 53
11. A part of a measured section showing bed numbers, bed thicknesses, and cumulative thicknesses 54
12. A part of a measured section derived from a drill core 55
13. A stratigraphic cross section showing complex intertonguing 56
14. A stratigraphic columnar section 58
15. A chart showing divisions of time—major geochronologic, chronostratigraphic, and geochronometric units 59
16. A chart showing major series and provincial series terms used in the United States 61
17. A chart comparing geologic units, hydrogeologic units, and equivalent units in a digital ground-water flow model 68
18. A chart comparing geologic and hydrogeologic units with those in previous reports 70
19. A chart showing comparison of hydrogeologic units, rock-stratigraphic units, and time-stratigraphic units 72
20. Diagrams showing examples of designating and naming aquifers 78
21. A chart showing classification of mineral resources 96
22. A chart showing mineral-assessment classification based on level of resource potential versus level of certainty 97
23. “Author's Check List,” front and back (Form 9-1517, revised March 1987) 1
24. Special purpose index map 190
25. Location map accompanying figure 24 191
26. Special purpose index map showing geologic setting of the Illinois River sulfide occurrence 191
27. An index map identifying several published Geologic Quadrangle Maps and their geographic settings, including drainage and major highways and roads 1
28. Index map of the Sand Dunes Wilderness Study Area, Sweetwater County, Wyo. 193
29. Geologic map showing major outcrops of igneous and metamorphic rocks and lines of cross sections 196
30. Geologic map showing outcrop areas of Livingston Formation in the Madison and Gallatin Ranges, locations of paleontological collections, and sample sites of igneous rocks 198
31. Geologic map of Vermillion Creek area affected by the beheading of Irish Canyon 200
32. Part of a geologic map of the Lewis and Eldorado thrust plates from the southern part of Glacier National Park to Steamboat Mountain 201
33. Elements of a graph 203
34. Curve or line graph 204
35. An isochron plot 204
36. Horizontal bar graph 204
37. Column or vertical bar graph 204
38. Surface or band graph 204
39. Symbol graph 205
40. Collins diagram 205
41. Kite diagram 205
42. Nomograph 205
43. Piper diagram 206
44. Modified Piper diagram 206
45. Radiating-vectors diagram 206
46. Semilog concentration graph (Ropes diagram) 206
47. Stiff diagram 207
48. Circular (pie) diagram 207
49. Triangular diagram 207
50. Schmidt equal-area projection 207
51. A vertical bar and straight horizontal line combination graph 208
52. A combination of vertical bars and a curved line in a graph 208
53. A curved line and straight horizontal line combined in a graph 208
54. An inset of a smaller graph superimposed on a larger one 208
55. Diagram showing two methods of leading viewers through poster: numbers and arrows 243
56. Diagram showing attention-getting combination of curved and straight shapes and lines 243
57. Typed text enlarged on a copying machine 244
58. Diagram showing a method of using concealed thumbtacks to attach poster elements to the display board 245

Tables

2. Chemical symbols 106
3. Mineral symbols 108
4. Abbreviations, signs, and symbols for scientific and engineering terms 109
5. Conversion factors for SI (metric) and inch/pound (U.S. customary) units of measurement 122
6. The fog index by reading level 148
7. Definition and parts of a table 217
8. Mineral assemblages in samples of rocks from within and around the Taconic allochthon, southwestern Massachusetts and adjacent parts of Connecticut and New York 218
9. Geographic distribution of Early Jurassic ammonites from outcrops in northern and east-central Alaska 219
10. Major-oxide and normative mineral composition of the Chopawamsic Formation, Virginia 220
11. Production from medium and large oil and gas fields of Utah 221
12. Thickness of the three parts of the Yale Member, Ironwood Iron-Formation, Wisconsin and Michigan 221
13. Location, stratigraphic position, and age of phytoclase samples from early Mesozoic basins in the Eastern United States 222
14. Some English terms and their foreign equivalents 239
15. Widths for camera-ready tables 258