AUTHORS' GUIDE

Fourth Edition, Version 20081103

FOREWORD

Scientific publication has undergone a major transformation over the past few years as publication in electronic form has begun to flourish, and this edition of the AMS *Authors' Guide*, now disseminated in electronic form only over the Internet, reflects this transformation. The purpose of the *Authors' Guide*, however, remains the same as always—to provide instructions and guidelines that will assist authors, editors, and reviewers in preparing material for publication by the American Meteorological Society. The style guidelines presented here should be followed by authors preparing a scientific research paper for a journal, monograph, or book; a chapter of a book; or a full-length book or monograph. At present the AMS handles over 1600 scientific papers per year. It is a tremendous task to see these papers through the editorial, printing, and online dissemination processes. Compliance with the guidelines and instructions presented here will help to produce better-written and more accurate publications in a more timely manner. An effort will be made to update this document continuously so that it always contains the most current information on AMS publications and procedures. We hope authors will consult it frequently and that they will make suggestions for its improvement.

Although the actual writing and maintenance of this guide are solely the responsibility of the AMS Publications Department, it could not have been completed without the assistance of many AMS staff members and the volunteers who serve on the AMS Publications Commission.

A *Brief Guide for Authors* is also available on the Internet. This short document includes the most important information for contributors to AMS publications.

AMS Publications Department

Part I. Publications of the AMS

1. Introduction

The constitution of the American Meteorological Society lists as its objectives "the development and dissemination of knowledge of the atmospheric and related oceanic and hydrologic sciences and the advancement of their professional applications." One way in which the Society pursues these objectives is through publication of journals, newsletters, books, and monographs.

The publications of the AMS fall into two broad categories: those produced by Society Headquarters and those under the auspices of the Publications Commission. In general, the division between these two groups relates to the extent of their scientific assessment through the peer-review process. This *Authors' Guide* applies to both groups, although most of the text addresses peer-reviewed material under the aegis of the Publications Commission.

These are exciting times in the world of scientific publications and in particular for the Society's publications program as new electronic publishing opportunities present themselves. The AMS has been aggressive in its exploitation of the electronic media, both in terms of taking advantage of the latest technology in the production and dissemination of its print journals—all AMS print journals are delivered online in addition to print—and in producing new journals, such as *Earth Interactions*. In addition, the Society has been providing new services such as CD-ROM supplements to the print journals and the ability to place supplemental material online through the AMS Web site. Also, the Legacy database provides access to every journal article ever published by the AMS.

2. Society Headquarters publications

The Society issues several publications that are produced under the direction of the executive director, who acts under the general guidance of the AMS Council. Foremost among the Headquarters publications is the *Bulletin of the American Meteorological Society*, the official organ of the AMS, which has been published since 1920. The *Bulletin* contains a wide variety of information, including scientific papers of a scope so broad that they do not easily fit into a particular scientific journal. Following an initial screening by *Bulletin* staff, these papers are peer reviewed. The final publication decision is made by the editor-in-chief of the *Bulletin*.

The Society also publishes a broad spectrum of scientific and technical books; some are historical in nature and others are contributed volumes arising from workshops and conferences. In addition, the AMS has published a glossary, several encyclopedic works, a series of bibliographies, and translations. Unlike the volumes in the *Meteorological Monograph* and *Historical Monograph* series, these books typically do not include refereed papers, even though they are written by specialists in the field.

A third broad category of printed/typeset material consists of preprints of papers to be presented at scientific conferences sponsored or cosponsored by the AMS. These preprint volumes have been issued since 1951 and contain non–peer reviewed and usually abbreviated manuscripts. The requirements for each preprint volume vary, but the usual procedure is that each author with a paper accepted for a particular conference will receive from AMS

Headquarters a set of instructions for preparing the paper for the volume, which must be submitted in camera-ready form. Deadlines for receipt of the manuscripts are included in the instructions sent to the authors and are announced in the *Bulletin*. Preprint volumes or CD-ROMs, if produced, are available at the meeting for which they were prepared and can also be purchased directly from AMS Headquarters after the meeting has taken place. In addition, the AMS now has the capability to make digital recordings of the visual presentation material and accompanying oral presentation for meeting talks, and this material along with the extended abstracts can be made available on the Internet in addition to or in place of the traditional preprint volumes. From 1993 through 2007, the contents of the year's preprint volumes are collected into a CD-ROM product—allowing easy access to this information for researchers. Beginning in 2008, the preprints are distributed only through the Internet, allowing easy accessibility, reduced conference fees, and a later deadline for submission.

Meteorological Abstracts and Bibliography, later renamed *Meteorological and Geoastrophysical Abstracts*, was conceived of by the Society and began publication in 1950. This journal, which appears monthly in print and quarterly in CD-ROM format and is also available over the Internet, consists of abstracts of scientific and technical papers, books, and reports, derived from the major meteorological and oceanographic publications produced worldwide.

Last, AMS Headquarters issues miscellaneous publications in print or online, such as educational and career guidance brochures, a college curriculum guide, informational leaflets, and advertising fliers and catalogs. Two online publications of special note are the *AMS Update* (and its predecessor, *the AMS Newsletter*), which provides timely information on government and other activities relating to the Society's fields of interest, and the *Employment Announcements*, which list a variety of career openings.

3. Journals and other serials of the Publications Commission

Nine scientific journals and two monograph series are published by the Society under the direction of its Publications Commission: the *Journal of the Atmospheric Sciences*, *Journal of Applied Meteorology and Climatology*, *Journal of Physical Oceanography*, *Monthly Weather Review*, *Journal of Atmospheric and Oceanic Technology*, *Journal of Climate*, *Weather and Forecasting*, *Journal of Hydrometeorology*, *Earth Interactions*, *Meteorological Monograph Series*, and *Historical Monograph Series*. In addition, beginning in the autumn of 2009, a tenth peer-reviewed journal, *Weather, Climate, and Society*, will begin publication.

All papers appearing in these serials have undergone peer review and editorial judgment by an editorial board appointed by the AMS Council. The editorial board is composed of volunteers who oversee the peer-review portion of the editorial process. Accepted papers are then sent to AMS Headquarters, where the full-time publications staff carries out the production portion of the publication process.

The history of AMS journals is an interesting one. It began in 1944 with publication of the *Journal of Meteorology*. In 1962 this first AMS journal was divided into the *Journal of the Atmospheric Sciences* and the *Journal of Applied Meteorology*. In 1983 climatology was added to the latter journal, and it became the *Journal of Climate and Applied Meteorology*. By 1988 the climatology articles spread among the AMS journals had become such that it was possible to

split off a separate *Journal of Climate*, leaving the *Journal of Applied Meteorology* with its original title and content. In 2006, the *Journal of Applied Meteorology* was given the new name *Journal of Applied Meteorology and Climatology* to reflect a renewed editorial focus on publishing applied climatological research, including climate as it relates to the environment and society, that may not be appropriate for the *Journal of Climate*.

The growth of research in the oceanographic sciences led, in 1971, to the founding of the *Journal of Physical Oceanography*. *Monthly Weather Review*, which had been published by the U.S. government since 1872, became a journal of the AMS in 1974. The Society began the *Journal of Atmospheric and Oceanic Technology* in 1984 and *Weather and Forecasting* in 1986. The *Journal of Hydrometeorology*, began in 2000. Beginning in autumn 2009, *Weather, Climate, and Society* will fill a niche to accommodate research that addresses the interactions of weather and climate with society, including economic, policy, institutional, social, and behavioral research.

The *Meteorological Monograph Series*, devoted to the occasional publication of extended papers or a series of related shorter papers addressing a single theme, began in 1947 with a review of developments in applied climatology resulting from World War II. The 54th volume in this series appeared in 2004. Under the aegis of the Board of Meteorological Monographs, but with a separate editor, is the *Historical Monograph Series*. Its first volume was published in 1977; the two latest were released in 2007.

An all-electronic journal, whose first articles appeared in 1997, is an additional publication of the AMS. This journal, *Earth Interactions*, is an interdisciplinary journal in the earth system sciences that exploits the capabilities of electronic publication to their maximum effect. For this journal, the AMS has been joined by two other societies, the American Geophysical Union and the Association of American Geographers, who are serving as copublishers. While this new journal is fully peer reviewed and edited at the high level associated with other AMS journals, its editorial style is a blend of the copublishers' styles and the means of submission is markedly different than that for print journals. This guide does not cover the information necessary to contributors to *Earth Interactions*, but this information can be found on the *Earth Interactions* Web site.

The AMS Publications Commission, which is responsible for these serials, is appointed by and reports to the governing body of the Society, its Council. The commission includes a chairperson (the commissioner), the chief editors of AMS serials, and three members-at-large. It meets at least annually to report on the progress of each serial, discuss publishing matters of importance to the Society, and report back to the Council on the state of AMS publications.

a. Scientific scope of journals and serials

It is important that potential authors understand the individual nature of each AMS journal, so that scientific papers may be submitted to the journal with the appropriate readership. In very broad terms, the scope of each existing AMS journal is as follows.

- *Journal of the Atmospheric Sciences* (*JAS*) publishes basic research related to the physics, dynamics, and chemistry of the atmosphere of Earth and other planets, with emphasis on the quantitative and deductive aspects of the subject.

- *Journal of Applied Meteorology and Climatology* (*JAMC*) publishes applied meteorological research related to physical meteorology, weather modification, satellite meteorology, radar meteorology, boundary layer processes, air pollution meteorology (including dispersion and chemical processes), agricultural and forest meteorology, and applied meteorological numerical models. The journal also publishes applied climatological research related to the use of climate information in decision making, impact assessments, seasonal climate forecast applications and verification, climate risk and vulnerability, development of climate monitoring tools, urban and local climates, and climate as it relates to the environment and society.

- *Journal of Physical Oceanography* (*JPO*) publishes research related to the physics of the ocean and to processes operating at its boundaries. Observational, theoretical, and modeling studies are all welcome, especially those that focus on elucidating specific physical processes. Papers that investigate interactions with other components of the earth system (e.g., ocean–atmosphere, physical–biological, and physical–chemical interactions) as well as studies of other fluid systems (e.g., lakes and laboratory tanks) are also invited, as long as their focus is on understanding the ocean or the ocean's role in the earth system.

- *Monthly Weather Review* (*MWR*) publishes research results relevant to the analysis and prediction of observed atmospheric circulations and physics, including technique development, data assimilation, model validation, and relevant case studies. This includes papers on numerical and data assimilation techniques that apply to the atmosphere and/or ocean environments as well as socioeconomic analyses of the impacts of weather and weather forecasts. *MWR* focuses on phenomena having seasonal and subseasonal time scales. Reviews of climatological aspects of high-impact events such as hurricanes, *as well as review articles*, are occasionally published.

- *Journal of Atmospheric and Oceanic Technology* (*JTECH*) publishes research describing instrumentation and methodologies used in atmospheric and oceanic research, including remote sensing instruments, measurements, validation, and data analysis techniques from satellites, aircraft, balloons, and surface-based platforms; in situ instruments, measurements, and methods for data acquisition, analysis, and interpretation; and information systems and algorithms.

- *Journal of Climate* (*JCLI*) publishes climate research and, therefore, welcomes manuscripts concerned with large-scale variability of the atmosphere, oceans, and land surface, including the cryosphere; past, present, and projected future changes in the climate system (including those caused by human activities); and climate simulation and prediction. Occasionally *JCLI* will publish review articles on particularly topical areas. Such reviews must be approved by the chief editor prior to submission.

- *Weather and Forecasting* (*WAF*) publishes research on forecasting and analysis techniques, forecast verification studies, and case studies useful to forecasters. This includes submissions that report on changes to the suite of operational numerical

models and statistical postprocessing techniques, demonstrate the transfer of research results to the forecast community, or illustrate the societal use and value of forecasts. Contributions that focus on forecasting and analysis techniques from the very short range out to seasonal time scales are welcome.

- *Journal of Hydrometeorology* (*JHM*) publishes research related to the modeling, observing, and forecasting of processes related to water and energy fluxes and storage terms, including interactions with the boundary layer and lower atmosphere, and including processes related to precipitation, radiation, and other meteorological inputs.

- *Earth Interactions* (*EI*) publishes in the electronic medium original research in the earth system sciences with emphasis on interdisciplinary studies. Within this framework, the journal particularly encourages submissions that address interactions among lithosphere, hydrosphere, atmosphere, and biosphere in the context of global issues or global change.

- *Bulletin of the American Meteorological Society* (*BAMS*) publishes papers on historical and scientific topics that are of general interest to the AMS membership. It also publishes papers in areas of current scientific controversy and debate, as well as review articles.

- *Meteorological Monographs* (*MM*) are occasional publications on single meteorological, climatological, oceanographic, or hydrologic themes and may be extended single papers or a series of related shorter papers.

- *Historical Monographs* (*HM*) are occasional publications on the history or historical aspects of meteorology, climatology, oceanography, or hydrology.

The terms of reference for the forthcoming new peer-reviewed scholarly journal are as follows:

- *Weather, Climate, and Society* publishes research and analysis on the interactions of weather and climate with society and encompasses economic, policy, institutional, social, and behavioral research, including mitigation and adaptation to weather and climate changes. Articles may focus on socioeconomic, policy, or technological influences on weather and climate or on the socioeconomic impacts of weather and climate. They may involve policy research and analysis, research on the relationship of weather and climate to environmental resources and health, or assessments of the social implications of new climate technologies and services. Because of the interdisciplinary subject matter, articles that involve both natural/physical scientists and social scientists are particularly encouraged. The substantive and policy breadth of *Weather, Climate, and Society* means that its readers will include social scientists, meteorologists, earth scientists, oceanographers, atmospheric scientists, engineers, and epidemiologists as well as policy and decision makers in both the public and the private sector.;

These brief descriptions of scope may leave uncertainties as to the appropriate journal for

certain manuscripts, in which case the following more detailed guidelines, arranged by subject area, should be consulted by potential contributors (material appropriate for *Weather, Climate, and Society* has not yet been incorporated into this discussion; the chief editor of the journal should be consulted for further guidance).

In the final analysis, the chief or co–chief editor's judgment will be the criterion for deciding whether the subject matter of a manuscript is suitable for the journal to which it has been submitted. Authors may find it helpful to review several recent issues of AMS journals to get a feel for the typical subject areas and scope of each journal.

1) NUMERICAL MODELS AND MODELING

Manuscripts on numerical models developed to study basic atmospheric processes are published in *JAS*. *MWR* is the proper journal for manuscripts on models with direct application to forecasting and sensitivity studies with well-established models. Manuscripts on numerical forecasting techniques of interest to modelers of either atmosphere or ocean, and on objective analysis and data assimilation, ordinarily are submitted to *MWR*, but papers describing data processing techniques are also appropriate for *JTECH*. Models on urban or similar scale, with application to the spread of pollutants, generally belong in *JAMC*, but if the forecasting of air pollution is emphasized, the manuscript may be more appropriate for *MWR*. Evaluations of the forecast skill of operational numerical models are appropriate for *MWR* or *WAF*. Manuscripts about climate models and climate prediction are appropriate for inclusion in *JCLI*.

2) ATMOSPHERIC STRUCTURE AND CLIMATE

Journal choice for manuscripts that involve climate studies depends on the emphasis and intended readership. Numerical simulations or diagnoses of the present-day atmospheric structure and circulation may be submitted to *JAS* or *MWR*. Papers on analysis of weather regimes, growth and decay of monsoons, interannual variability, and seasonal weather patterns are normally included in *JCLI* but may also be appropriate for *MWR*. Papers presenting the results of numerical experiments on climate change are suitable for *JCLI*, but expositions of the theory of climate or climate change would be more appropriate for *JAS*. Manuscripts that concern the long-term impacts of climate on societal and economic activities should go to *JCLI*, whereas papers on shorter-term climatic issues, such as urban, local, agricultural, or forest impacts, may be more appropriate for *JAMC*. Manuscripts that focus on and model the ocean's role in climate change may be appropriate for *JPO*.

3) INSTRUMENTATION

Manuscripts describing instrumentation for the atmospheric and oceanic sciences should be submitted to *JTECH* if the focus is on the technical aspects of the subject. Manuscripts that focus on scientific rather than technical results should be sent to another journal, even if they include descriptions of instrumentation or techniques in support of those results. Manuscripts describing the results of measurements using new instrumentation are appropriate for *MWR*, *JPO*, or *JAMC*, but papers treating the data processing techniques (e.g., for satellite or radar data) are considered by *JTECH*. Manuscripts that describe a proposed or existing measuring program (without principal emphasis on analysis of the measurements) should ordinarily be sent to *JTECH*, unless of very clear interest to *MWR* or *JAMC* readerships.

4) WEATHER AND CLIMATE MODIFICATION

JAMC publishes papers on planned and inadvertent weather modification. *JCLI* publishes papers on climate change.

5) CLOUD PHYSICS AND DYNAMICS

JAS is the appropriate journal for manuscripts on cloud structures, circulations, and dynamics, as well as fundamental aspects of cloud physics. Purely observational studies of weather systems should go to *MWR*. Papers on remote sensing and retrieval of clouds and precipitation often appear in *JAMC*.

6) STATISTICAL TECHNIQUES

Manuscripts on statistical techniques associated with data processing (e.g., hypothesis testing, data handling methods, and decision theory) are usually best suited to *JTECH* if the focus is on the technique and to *JAMC* if the focus is on results. Results in weather modification historically have been published in *JAMC*, and so statistical techniques developed for such use are appropriate there. Statistical forecasting techniques and verification procedures may be reported in *MWR*, and verification studies related to operational statistical forecasting are appropriate for *WAF*. Those statistical techniques incorporating atmospheric dynamics and relevant to an understanding of atmospheric behavior may appear in *JAS*.

7) GENERAL CIRCULATION

Analyses of meteorological data to produce general circulation statistics, and studies designed primarily to describe atmospheric phenomena, may be suitable for *MWR*, *JCLI*, or *JAS*, depending on the intended readership. If the study relates the general circulation to aspects of climate and climate change, it may be most appropriate for *JCLI*. Analysis of the general circulation of the ocean may be most appropriate for *JPO* unless coupled aspects with the atmosphere are emphasized, in which case *JCLI* is more appropriate.

8) ATMOSPHERIC CHEMISTRY

Fundamental contributions to atmospheric chemistry should go to *JAS*, but manuscripts on air pollution and the application of atmospheric chemistry to specific problems go to *JAMC*. Manuscripts describing instrumentation for atmospheric chemistry are appropriate for *JTECH*. Studies addressing the impact of atmospheric composition on radiative forcing may appear in *JCLI*.

9) PHYSICAL AND DYNAMIC OCEANOGRAPHY

JPO publishes research of a broad scope, both observational and theoretical, on such topics as oceanic circulation and property distributions, gravity waves, low-frequency motions, mesoscale and coastal dynamics, air–sea fluxes, and mixing processes. Theoretical studies include numerical as well as analytical modeling. Papers that involve instrument development, sampling strategy, and analysis methodology should be submitted to *JTECH*. The scope of *JPO* overlaps that of the other journals in the areas of climatology and air–sea interaction; however, if the research reported emphasizes the ocean, it should be sent to *JPO*.

10) SEVERE STORMS AND MESOSCALE METEOROLOGY

Manuscripts on the structure and dynamics of severe storms and mesoscale circulations are appropriate for *JAS*. Observational studies and numerical simulations of severe storms and mesoscale systems including physics aspects such as lightning and microphysics, are usually submitted to *MWR*. Papers that emphasize applications of mesoscale models to specific regional problems and include comparisons with observations are appropriate for *JAMC*.

11) WEATHER FORECASTING

WAF publishes papers that address aspects of weather forecasting. These topics include papers on forecast techniques for specific phenomena (such as lake-effect snowstorms), on the use of operational models in forecasting, and on synoptic-scale and mesoscale weather analysis techniques.

12) HYDROLOGY

JHM publishes papers on all aspects of surface hydrology and hydrometeorology. Papers that address applied aspects of hydrology may also be appropriate for *JAMC*, and those on operational hydrometeorology may be appropriate for *WAF*.

13) EARTH SYSTEM SCIENCE

EI encourages submissions that address interactions among lithosphere, hydrosphere, atmosphere, and biosphere in the context of global issues or global change.

b. Editorial structure of journals and serials

The editorial board of each journal generally consists of a *chief editor* (or, sometimes, two *co–chief editors*), one or more *editors*, a number of *associate editors*, and a *technical editor*. Note in this respect that each journal has individual characteristics; the material available at the AMS Web site and printed on covers 2 and 3 of each journal should be consulted for more specific information on this subject and individual editorial requirements.

The primary function of each editorial board is to see that manuscripts accepted for publication consist of appropriate subject matter for that journal, are of high scientific quality, and are well written. Except for the technical editor, members of an editorial board are unpaid volunteers usually working at research and academic institutions. In brief, the role of each editor in the review process is as follows.

- The chief editor or co–chief editor is the first person to consider a submitted manuscript. If received by one co–chief editor, it may be passed along to the other if more appropriate. (Manuscripts submitted to *JPO* have been considered directly by the appropriate editor—see the inside cover of *JPO* for more information—but beginning in 2009 *JPO* will follow the model used by the other journals.)

- The chief editor may assign responsibility for the review, revision, and acceptance/rejection of a paper to another member of the editorial board or may retain that responsibility. The assigned editor seeks the advice of scientific *reviewers* who are knowledgeable in the subject area of the paper and then is responsible for

deciding if the manuscript is to be published.

- Associate editors usually have expertise in some area covered by the journal and frequently serve as reviewers of papers in that area. They may be consulted by the editors in controversial cases and they provide a general source of advice and opinion to the editors. They may serve occasionally as editors for papers in their particular area of expertise and may be asked to rapidly provide reviews in cases when the originally requested reviews are not forthcoming or are in conflict.

- After a manuscript has been accepted for publication, it is forwarded to AMS Headquarters; the AMS technical editor is responsible for liaison between the author and the printer.

4. Review procedures

a. Articles and notes

The principal objectives of the peer-review process are to ensure that manuscripts accepted for publication in the journals and other serials describe work of high scientific quality that is presented in a clear and attractive manner. The review procedure is a vital part of the process of improving the communication of research ideas and accomplishments.

A flowchart showing the general procedures for handling an article or note is shown in Fig. 1. The diagram is basically self-explanatory but a few comments are in order. Note that the first few steps in the flow chart reflect obsolete procedures from when paper manuscripts were submitted directly to the field editor's office. The correct procedure is explained below.

Electronically (or, if necessary, hard copy) submitted manuscripts are first screened by AMS Headquarters to see whether they are complete and in proper format (see Part II). The screening form that is used for this purpose is similar to the itemized list shown in Fig. 2. If the items on this form are not met, the author is notified that the submission is incomplete. *In most cases, the manuscript will not be dated nor will the remainder of the review procedure be initiated until the author provides a complete submission In some cases, the peer review may proceed while items are in the process of being met.* Authors may find it useful to review the itemized list in Fig. 2 prior to submitting their manuscript. If a manuscript qualifies by meeting the requested criteria, AMS Headquarters forwards the manuscript to the chief editor's office.

After receiving a manuscript, the chief or co–chief editor examines the subject matter and decides whether it is suitable for the journal to which it has been submitted. If a manuscript appears to be more suitable for another AMS journal, it will be returned to the author with a recommendation that it be submitted to that other journal. The chief editor may consult with his or her counterpart at the other journal before making this recommendation.

Based on the subject matter of the manuscript, the chief or co–chief editor chooses an appropriate editor to process the manuscript through the review, revision, and acceptance/rejection procedures. In some instances, a chief or co–chief editor may also serve as the editor for a manuscript.

Manuscripts of potential articles and notes are generally sent to two or three reviewers.

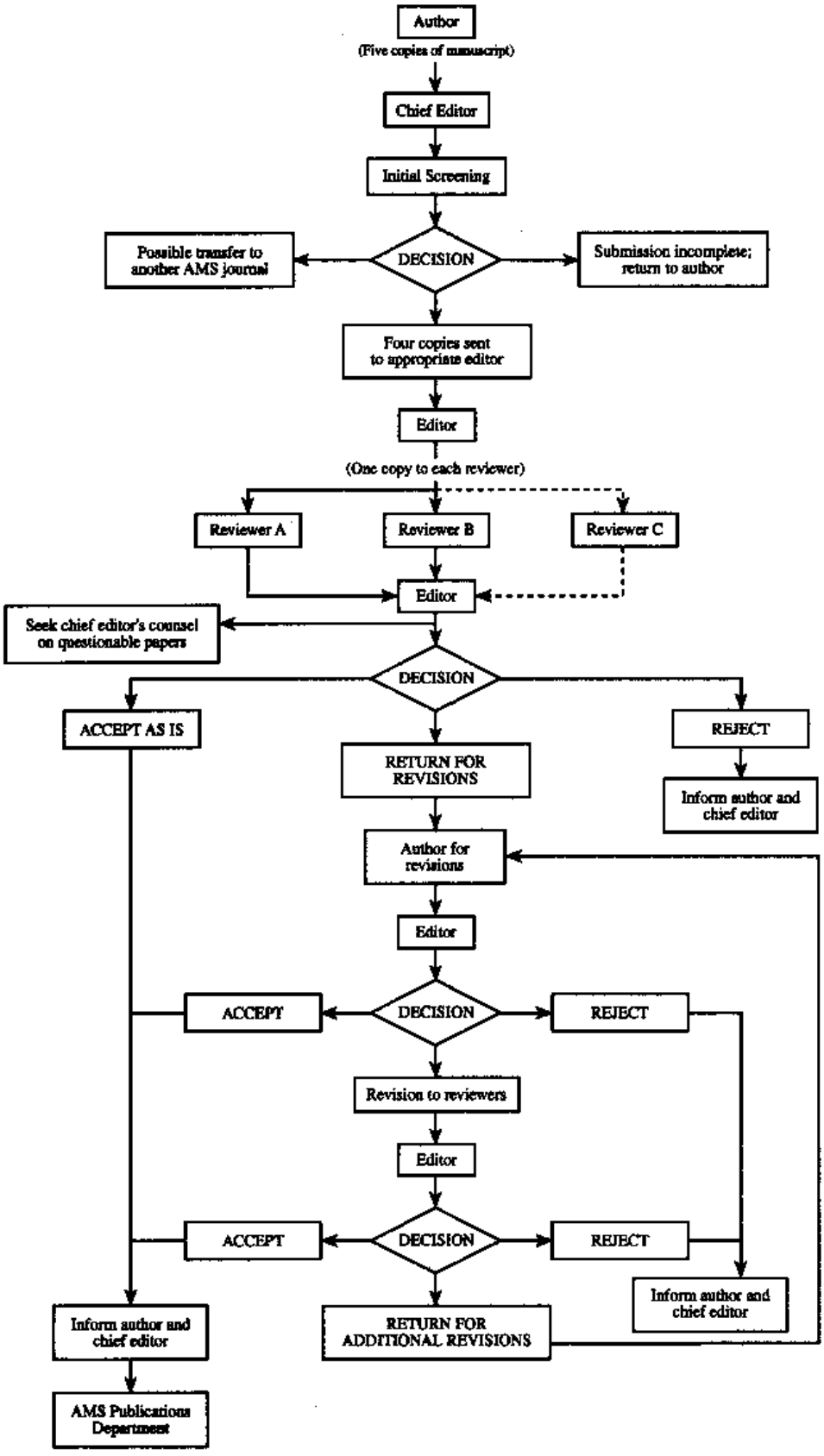
Author
(Five copies of manuscript)
Chief Editor
Initial Screening
DECISION
Possible transfer to another AMS journal
Submission incomplete; return to author
Four copies sent to appropriate editor
Editor
(One copy to each reviewer)
Reviewer A
Reviewer B
Reviewer C
Editor
Seek chief editor's counsel on questionable papers
DECISION
ACCEPT AS IS
RETURN FOR REVISIONS
REJECT
Inform author and chief editor
Author for revisions
Editor
ACCEPT
DECISION
REJECT
Revision to reviewers
Editor
ACCEPT
DECISION
REJECT
Inform author and chief editor
Inform author and chief editor
RETURN FOR ADDITIONAL REVISIONS
AMS Publications Department

Fig. 1

Qualification of Manuscripts

Items that must be in place before a submitted manuscript package can begin the peer-review process:

1) Properly signed copyright forms from all authors (submitted individually or together). Signed forms may be faxed, uploaded to the submission package, or scanned and e-mailed.
2) Length of no more than 7500 words (approximately 26 double-spaced pages, counting abstract through appendixes, but not list of figure captions or references). The author is required to request chief editor approval and to provide justification to obtain an exception to the length limit via a cover letter uploaded to the submission package as an auxiliary file.
3) Double-spaced text [three typed lines per inch (2.5 cm) measured from anywhere on the page], including abstract through appendixes.
4) Type that is 12-point font or larger.
5) Captioned figures and captioned tables placed at the end of the manuscript, rather than embedded in the text.
6) Tables must be black and white, not color or grayscale. To highlight information within a table, change the font style of the table entry and define in caption or footnote.
7) The following elements in the proper order: title page, abstract, body text, appendixes (if any), references, figures, and tables. Abstracts are required for articles and notes. Comments and replies, may include abstracts, but they are not required. Number all pages sequentially.

Additional items that must be in place before a manuscript can be accepted for publication (revisions will not be forwarded to the editorial field until these requirements are met):

1) Separate figure caption lists provided.
2) Abstract, introduction (or paper body), and figure caption list begin on new pages.
3) Double-spaced abstract, body text, appendixes, references, figure caption list, and table text and captions.
4) Tables set one per page, with captions set above the table text.
5) Manuscript source files must be uploaded. If the AMS LaTeX template has been used to create the manuscript, the author must also provide the necessary associated files (.pdf, .tex, .bib, .sty, and .bst).

Fig. 2

As noted previously, reviewers are selected for their expertise in the subject area of the paper. They are enjoined to maintain the confidentiality of the research results entrusted to them.

In determining the suitability of a manuscript for publication, the reviewers are asked to consider the following questions.

1) Is the study a worthwhile contribution to the field?

2) Are errors made in inference, interpretation, or mathematical analysis?

3) Is the presentation clear, concise, and well organized?

4) Is the abstract informative, giving the essence of the research in clear and sufficient terms?

5) Does the manuscript follow the format of the journals with respect to SI units, references, and so on?

The journal editor may provide additional instructions to reviewers on the types of recommendations they should provide, and some editors supply a checklist to guide reviewers.

Based on the reviewers' comments, an editor will make one of the following decisions.

1) *Accept as is*. Very few manuscripts achieve such a distinction the first time through the editorial cycle—in fact, fewer than 1%.

2) *Return for minor revisions* (e.g., reduction in length, improvement of references, improvements in clarity). In this case, the editor must decide whether the manuscript, once revised by the author, is acceptable for publication without returning it to the original reviewers. Usually, about 30% of all manuscripts fall into this second category.

3) *Return for major revisions* (e.g., further measurements or computations, additional analysis, substantial reorganization of manuscript). In this case, the editor will generally return the revised manuscript to the reviewers for their further comments and recommendations. Some 30%–40% of all manuscripts typically fall into this category.

4) *Reject*. Generally about 30% of all manuscripts submitted to AMS journals are rejected or withdrawn by the author.

5) *Submit the manuscript for publication elsewhere*. Although, as noted previously, the chief or co–chief editor screens manuscripts for this possibility, editors and reviewers may still suggest that the subject matter of a manuscript is better suited to another journal. About 3%–5% of the manuscripts received are recommended for transfer to other journals.

Authors are requested to complete revision of their manuscripts (see section 4c) and to return them to the editor as soon as possible. Manuscripts held for revision by an author for more than three months are considered to be new submissions and may be subjected once again to the

full review process. In the case of extenuating circumstance, the time limit may be extended at the discretion of the editor. Any such extension, however, should be requested by the author before the revision deadline passes.

The peer-review process discussed here and outlined schematically in Fig. 1 requires about six months on average, including the time typically taken by the author to revise the manuscript. The processing of accepted manuscripts at AMS Headquarters requires another four to six months, and so it is not uncommon for a paper to appear one year from the date of original submission. Authors who feel their work is especially timely and requires a more rapid dissemination should contact the chief or co–chief editors of the journal to which they are submitting their manuscript. In some cases it is possible to use an editor and associate editor to review the paper so that the review process can be completed more quickly. It should be clearly understood, however, that this abbreviated review process will hold a paper to the same high scientific standard.

After a manuscript has been accepted, it is forwarded to AMS Headquarters for processing by AMS's publication staff and the printer.

b. Procedures governing peer review in AMS journals

As part of a concerted effort to reduce the publication times of submitted manuscripts, it is the goal of all AMS journal editorial offices to adhere to the following practices for the peer review of submissions.

1) The editor's office handling the submitted manuscript will contact all potential reviewers in advance (provided the office is able to secure the phone number or e-mail address of the potential reviewer) to ensure that they have the interest and the available time to review the manuscript in a timely manner.

2) Reviewers will be asked to return the completed review within four weeks unless special circumstances warrant a different schedule. (In the case of multiple-part papers sent to reviewers, this time may, at the discretion of the editor, be increased to no more than eight weeks. For short contributions, this time may, at the discretion of the editor, be decreased to less than four weeks if the reviewer agrees when contacted by the editor.)

3) If the review has not been received by the editor's office within 30 days from the time it was mailed to the reviewer, a reminder will be sent (by phone or e-mail) to the reviewer stating that the review is now overdue at the editorial office. The reviewer will be informed that the review must be received within two weeks to be used in the editorial decision.

4) If the review is not received within two weeks after the reminder, the editor will either make a decision based on the other reviews received or secure an additional review from a reviewer who agrees in advance to provide the review within two weeks.

5) Late reviews received after the editorial decision has been made may, at the discretion of the editor, be forwarded to the author as additional input for revisions but will not

be used to change the editorial decision.

These policies should ensure that the editor's initial review decision on a submitted manuscript will be completed within 60 days. Authors should feel free to contact the editorial office to inquire about the reason for delay if they have not received the initial review decision by that time.

c. Correspondence

Correspondence containing comments on articles or notes that have been published in the journals may be submitted for publication provided that the article or note appeared within the previous two years. (This time limit may be waived at the discretion of the chief or co–chief editor.)

A copy of the correspondence or comments will be sent by the editor to the author of the paper being commented on (only the corresponding author in the case of a multiauthored paper). The author of the original paper will then have two months to submit a reply to the correspondence.

This time limit applies only if the author wishes the reply to appear in the same issue of the journal as the correspondence. If a reply is submitted by the original author *after* the two-month deadline, it may, if found acceptable, appear in a later issue of the journal. In such cases, the author of the correspondence will be given the opportunity to publish a response along with the reply following a procedure equivalent to that followed using the guidelines for the usual correspondence and reply cycle given below. Nevertheless, no reply to correspondence is considered for publication if it is submitted more than one year after the correspondence has appeared in the journal.

The reply, once received, will be sent to the author of the correspondence, who may then withdraw the correspondence (in which case neither the correspondence nor the reply would be published), revise the correspondence (within one month of receiving the reply), or leave the correspondence unchanged. If the correspondence is revised, it is sent to the original author of the paper, who then has the opportunity to amend the reply.

The editor may decide to have the correspondence and reply reviewed at any stage of this process. A second correspondence from the same person on the same original paper will not, in general, be accepted.

If two or more comments from different persons are submitted on a single paper, they may each be considered for publication. If their contents are judged by the editor to be quite similar, however, the correspondence received first may be accepted and the later correspondence rejected. The author of the original paper will be encouraged to combine his or her replies to all comments into a single reply.

After a correspondence manuscript has been accepted, it is forwarded to AMS Headquarters for processing.

d. Revising a manuscript

It is unusual for a manuscript to be accepted without any queries. If a manuscript is conditionally accepted, subject to minor revisions, the author should consider carefully the suggestions and comments of the reviewers and the editor. Even conditional acceptance pending major revision should be viewed by the author as positive in the sense that the author's work is deemed worthy of publication provided some key points are addressed.

If a manuscript is rejected, or major revisions are requested, it is not productive for the author to get angry or enter into acrimonious correspondence with the editor; rather, the criticisms should be viewed as being constructive. Revision is seen as an opportunity to substantially improve the original manuscript. If the author has doubts about the criticisms, he or she should discuss them with colleagues and decide whether the major objections of the reviewers can be met. If not, consideration should be given to withdrawing the manuscript rather than continuing to subject it to the review process.

If the author agrees with the criticisms, he or she should revise the manuscript accordingly. It is again suggested that the author ask colleagues to read the revised manuscript in light of the reviewers' comments. Further revision may be necessary at this stage.

In the cover letter that is sent to the editor with the revised manuscript, the author should enumerate, with numbered statements corresponding to the numbered comments of the reviewers, the substantive changes that have been made to the paper. If major points raised by the reviewers have not been addressed, the author should fully explain why not.

Manuscripts may be rejected if they are considered to be poorly written. In this case, especially for authors for whom English is a second language, authors may want to consider asking colleagues for help so that the manuscript can be rewritten and resubmitted.

5. Processing of manuscripts by AMS Headquarters and printers

a. Publication schedule

When a manuscript is submitted for peer review, it receives a tracking number (e.g., *JPO* 3513) that will uniquely identify it throughout the publication process. This number is in addition to the "package number" that is used to upload files associated with a submitted paper and should be used in all subsequent correspondence concerning the paper. The AMS has implemented a new in-house manuscript tracking system that interacts with the peer-review database, and therefore this identification number now will be retained all the way through to publication. At the time a paper is accepted, in addition to correspondence from the field editor, the corresponding author is sent an acknowledgment e-mail confirming receipt at AMS and listing any additional requirements from the author.

The normal publication schedule may vary depending on workloads at both Headquarters and the printer, but it currently involves a period of about six months from the time a manuscript is received at Headquarters to the time subscribers receive their copies of the issue. A flowchart illustrating the main stages in the publication process after the manuscript has been accepted and forwarded to AMS Headquarters is shown in Fig. 3.

The Papers to Appear list no longer appears in the printed journals or at the AMS Web site. Instead, within one week of acceptance of a manuscript and transmittal to AMS

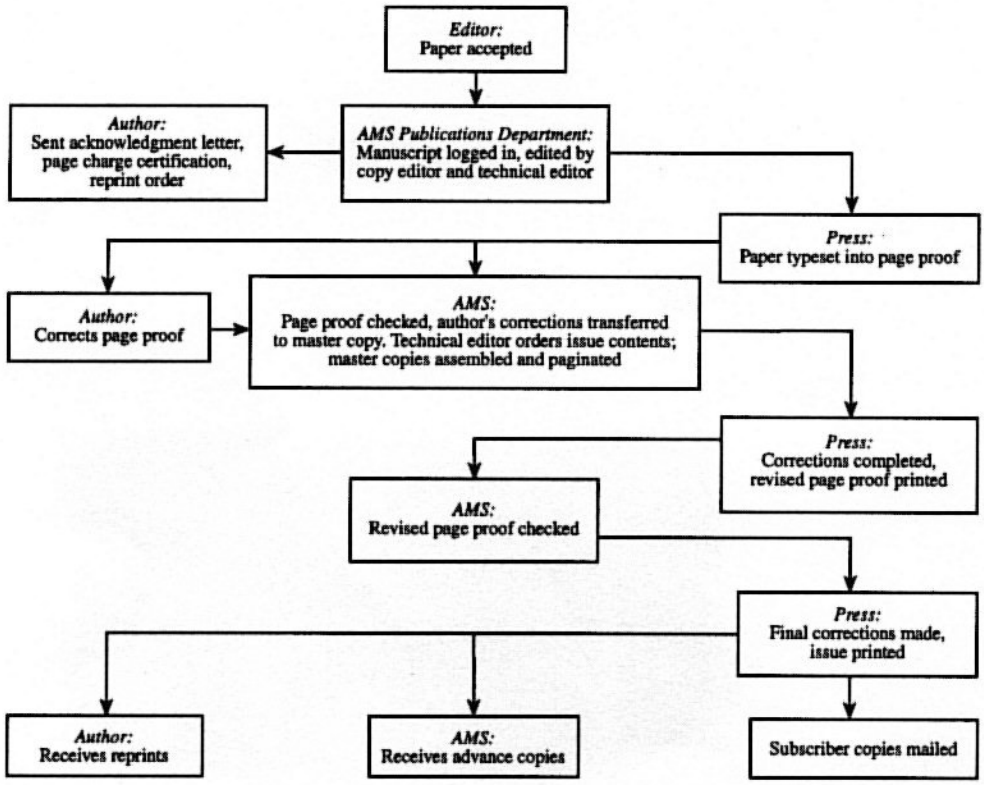
Editor:
Paper accepted
Author:
Sent acknowledgment letter, page charge certification, reprint order
AMS Publications Department:
Manuscript logged in, edited by copy editor and technical editor
Press:
Paper typeset into page proof
Author:
Corrects page proof
AMS:
Page proof checked, author's corrections transferred to master copy. Technical editor orders issue contents; master copies assembled and paginated
Press:
Corrections completed, revised page proof printed
AMS:
Revised page proof checked
Press:
Final corrections made, issue printed
Author:
Receives reprints
AMS:
Receives advance copies
Subscriber copies mailed

Fig. 3

Headquarters, the abstract and the author-approved PDF file used for peer review are now posted (unless the author opts out) at the "Early Online Releases of Papers in Press" (EOR) section of the AMS Journals Online site, in the same fashion and at the same site as already published papers. These postings are assigned a DOI and are immediately citable and searchable. When the official typeset version of the paper is printed and posted, it replaces the EOR version at the Web site but the DOI is retained for continuity of citation.

b. Publication charges

Along with the acknowledgment communication e-mailed to the principal author from Headquarters is a link to a publication charge certification form. As of 1 January 2008, AMS page charges are $140 per printed page. Reproduction of color figures is significantly more expensive and results in higher page charges, which are explained more completely in Part II, section 9d. An author can estimate page charges based on his typed manuscript using the following formula: (number of printed pages) = 1/3(number of manuscript pages, including tables and caption list) + 1/3(number of figure pages) + an additive factor of 1–4 (4 is used by AMS staff to estimate page charges but gives a conservative result when compared with actual printed papers).

Publication charges are financial contributions from authors' institutions to the cost of disseminating research results and should be regarded as an essential and proper part of the research budget. They are designed to cover the cost of editorial, composition, and related work needed to prepare an article for publication. Payment of publication charges is expected by the Society. The AMS upload system makes authors aware of their estimated page and color charges at the time of submission. At initial submission, an author must agree to pay all charges or must contact AMS to discuss why page charges cannot be honored before a paper will be considered for peer review. In some situations, a partial or full waiver may be granted for page charges at the discretion of the AMS, although all color charges are expected to be honored. If an author's institution is unable to pay the publication charge for a manuscript and has been granted a waiver, the reason must be stated on the publication charge certification form. As stated in the editorial by the AMS president that appeared in December 2004 issues, AMS is beginning to take steps to increase compliance with page charge payment and failure to pay may result in delays in publication.

Authors publishing research results stemming from federally funded research projects should include sufficient funds in their contracts and grants to cover publication charges. Moreover, since publication of research results may not take place until many months after the research is completed, the authors should encumber publications funds from loss due to the termination of the contract or grant.

The acceptance of publication charges is provided for by the following federal page charge policy.

"Scientific policy representatives of federal agencies that constitute the Federal Council for Science and Technology have established the following criteria for honoring page charge bills submitted by journal publishers:

1) The research papers report work supported by the Government.

2) Mandatory or voluntary page charge policies are acceptable, provided that the page charge policy for the publication is administered impartially for Government and non-Government sponsored research reports.

3) The journals involved are not operated for profit."

AMS publications satisfy all of these requirements.

Foreign authors are requested to meet page charges within the context of their own national funding guidelines.

c. Reprints

The publication charge certification form also provides a means for authors to order reprints of the published paper. This form includes a current reprint price list and a reprint order blank. If the publication charge is honored, the first 50 reprints (except for *BAMS* reprints) are free to the author and additional reprints can be purchased at a low incremental price. If the publication charge is not honored, the first 50 reprints are not free (and the setup charges associated with reprint production are included), and so the rate charged for the reprints is considerably higher. The pricing structure for reprints when the page charges are not honored is available on request and will be mailed to authors if they are not able to honor publication charges.

Please note that standard stock covers are not provided free of charge, even on the first 50 reprints. Also, any deviation in the reprint from the regular size and format of the journal will result in additional charges.

The reprint prices quoted on the reverse side of the publication charge certification form apply to the single instance of a reprint being ordered at the time of publication of the article and of the reprint being printed in the printing cycle established by the printer (an "offprint"). Reprints ordered at this time are produced during the normal printing of the journal and take advantage of the press setup used to print the issue, which significantly reduces the total setup costs for reprint preparation—especially when color figures are included, since no additional charge is then assessed for color figures in the reprints. If reprints are ordered too late to be produced in this manner, a completely separate printing must be initiated for the reprint at much higher cost, and if color figures are included the additional charges can be very high. The author must bear this increased cost in the form of higher rates that will be charged for the reprints. It is therefore extremely important for an author to return the publication charge certification form in a timely manner and be sure to include the order for any additional reprints that might be desired at that time.

Note also that reprints to be shipped outside the United States are sent by surface mail and may take from three to six months to arrive, depending on destination. Foreign authors may request airmail delivery if they are willing to absorb the extra cost. For further information on reprints and their pricing, write: Business Manager, AMS Journals, American Meteorological Society, 45 Beacon Street, Boston, MA 02108-3693.

d. Manuscript styling, layout, and copyediting

After the manuscript is received at AMS Headquarters, the references and figures are checked and the paper is handled at least twice—once by a copy editor and once by a technical editor. The copy editor's review is concerned with basic grammar and styling (e.g., reviewing sentence structure; checking text for style, spelling, and punctuation; checking references for consistency and style; and marking type size and font with special attention to the titles of sections and subsections). The technical editor's review serves to check that the copy editor's changes have not changed the scientific meaning and addresses such additional areas as layout of equations, undefined symbols or abbreviations, correctness of captions in relation to figure or table content, correct use of scientific and technical terminology, and proper layout of tables and captions. The technical editor also controls figure sizing and layout.

In addition to establishing suitable manuscript styling and structure, this phase of the editorial process entails communication between Headquarters and the typesetter and printer, so that the best possible reproduction in type of the manuscript may be made. To this end the technical editor identifies and interprets author manuscript content for the printer, and both the copy and technical editors mark queries on the manuscript that are relayed to the author by the printer on the page proofs. The typesetter addresses queries to the author and editorial staff and identifies other editorial inconsistencies when found in the original manuscript or the editorial revisions.

e. Author proofreading

By approximately two to four weeks after manuscripts are sent to the typesetter, page proofs are prepared. One set of page proofs is made available to the author electronically as a PDF file, along with instructions. An additional set of page proofs is sent to AMS Headquarters for use by the copy and technical editors.

It is expected that on receipt of page proofs the author will immediately proofread and correct the proofs and return an annotated PDF file, a marked-up copy, or a list of changes to AMS Headquarters by e-mail, facsimile, and/or mail. Proofreading and correction involve making all essential deletions, additions, and revisions, taking care, wherever possible, to add equivalent letters and words where letters and words are deleted, and vice versa, to avoid significantly altering page layout. Longer additions and deletions may lead to additional page charges being assessed to the author to cover the remake of pages.

The AMS editorial staff reviews returned page proofs, transferring author's changes to a set of Headquarters page proofs. Final discretion on whether to implement requested author changes rests with the AMS editorial staff. The abstract is read, section headings and references are checked, the figures are proofed, and a final check is made for further inconsistencies based on author corrections and press queries. Corrected page proofs are then returned to press.

Please note that it has long been AMS editorial policy not to provide a comprehensive proofreading of page proofs. Thus, the author ultimately assumes the major responsibility for the accuracy of the typeset paper. Only on *rare* occasions will authors receive a copy of revised page proofs. The directions for page proofs now contain wording that informs the author that by returning the marked-up proofs or comments to AMS the author is taking responsibility for the accurate content of those proofs.

In its correspondence with authors, the AMS requests that page proofs be proofread and returned to Headquarters as soon as possible—preferably within 48 hours. The author may feel that it is not crucial that the deadline be met; however, delay in returning page proofs may delay publication by a month or more. The current AMS editorial policy is to place all returned page proofs for a particular journal into an author-return pool; when the deadline for the next issue of that journal is reached, the issue is made up and sent to press. The papers in the issue are taken in order of date of receipt at AMS Headquarters and may not necessarily be the papers originally scheduled for that issue. Authors returning their proofs late will have their papers reassigned to a later issue. Foreign-mail delays cause most of the problems in this area, but authors who will be on long trips should make provisions for a colleague to correct their page proofs if they are likely to be received while they are away. Authors are encouraged to use e-mail to avoid delays and to set spam filters so as not to block the transmittal of the proof e-mail from press. At the time an issue is made up, authors are informed by letter of the actual issue in which their papers will appear. Note that failure to pay page charges may result in papers appearing in a later issue than papers returned at the same time but whose authors are honoring page charges.

Authors should be aware that the receipt of page proofs is not a last-minute opportunity to rewrite the manuscript. Authors have an obligation to correct errors made by press and an opportunity to correct crucial errors that were overlooked or that may have developed since submission of the final draft of the manuscript. Alterations that go beyond these limits are not acceptable at page proof stage and may require additional review by the scientific editor of the journal to ensure that the changes in text are still acceptable for publication. The AMS technical editors will assess a standard author's alteration charge for each alteration that is deemed to be attributable to the author rather than to press or AMS editing errors.

In addition to making needed alterations, authors are requested to reply to all copyediting and press queries on the page proofs. Failure to do so usually leads to delays in publication or to corrections that may arrive too late to be incorporated.

f. Indexing

The technical editors create three to five keyword or phrase subject index entries for each paper published by the AMS. Because of the advanced search capabilities present in the online version of the journals, the subject index no longer appears as part of the December issue of each journal. However, the subject entries still play a key role as the AMS develops new ways to package journal subscriptions in a manner customized to the needs of individual users (e.g., they are used as part of the new "Personal Online Library" that is offered to AMS members in conjunction with the online journals database). The December issue still includes an author index for all articles published during that volume year. Authors may submit a list of keywords on their title page. In the future, the AMS hopes to publish or post a list of standardized keywords.

g. Copyright transfer

The AMS asks authors for a written transfer of copyright for manuscripts submitted to its journals. This formal transfer is required under the 1978 U.S. Copyright Law (Title 17 USC as revised by P.O. 94-553), so that the Society may have the same rights to materials published in its journals as those it had prior to 1978 under the old copyright law. A written transfer of the author's statutory copyright to the AMS is required, on the form provided by the Society

(available on the AMS Web site). Certain rights are still retained by the author, and the transfer takes effect only if the manuscript is accepted for publication by the AMS. The AMS copyright transfer form includes versions to be used for a U.S. government work if it is precluded from copyright protection. In this case, the author or authors simply certify that the work was prepared as part of their duties as officers or employees of the U.S. government.

A properly executed copyright transfer or a certification of U.S. Government manuscript must accompany each contribution. Failure to fill out and return the form will delay publication, since the file for the paper is not considered to be complete until a properly executed copyright form is included in it. *It is necessary that all authors, and not just the principal or corresponding author, sign the form.* Although AMS encourages submission of original ink signatures, their use is no longer required: facsimiles and scans are acceptable to proceed to review and publication, and multiple forms can be used to aid collection of the transfers from coauthors at different institutions.

The AMS prints its copyright notice on the inside front cover of each of its journals. Under the 1978 copyright law, this notice applies only to the journal as a whole; it does not apply to the articles individually. To be covered separately, each published article must include its own copyright notice on the first page. This is an important reason why the AMS requires authors to transfer their copyright. Without this separate copyright of the manuscript in its own name, the AMS could not protect the intellectual property of the author represented by the article from improper reprinting, publishing, and copying by unauthorized persons. It would be difficult for future users of the journal to track down individual article authors and obtain their permission in writing to reuse the paper, thus discouraging further dissemination of the information or encouraging illegal copying. At the same time, having the copyright in the name of the AMS avoids the confusion of having multiple copyright holders for each journal issue and provides a permanent central point for authorizing proper future use of all information published in the journals.

The overall journal copyright notice grants generous privileges of copying without permission and states the conditions under which permission to reproduce material from the journals must be obtained. The copyright law defines “fair use” explicitly and states other limited conditions for freely copying articles for use in research and teaching. Unless exempted by sections 107 and 108 of the law, by the journal copyright notice, or by the copyright transfer form, copying cannot be done legally without AMS permission.

When requests to use materials from the journals come to the AMS, the journals business manager routinely grants permission for the use of brief excerpts and single illustrations without charge. Requests to reprint longer excerpts or multiple illustrations are handled on a case-by-case basis, with permission normally granted without charge for educational or nonprofit use. Commercial users may be charged a nominal fee. The AMS does not supply the requester with film positives or negatives.

Inquiries concerning posting submitted manuscripts or published articles on the Web have increased in the past few years. The AMS policies concerning such postings are covered in the overall AMS Copyright Policies (AMS 1995) and are discussed further by Seitter and Weston (1995). These documents can be found at the AMS Web site.

Part II. Manuscript Preparation and Submission

1. Introduction

These style guidelines are intended primarily for use in writing research papers for AMS journals. With some exceptions noted in the following, however, they also apply to other AMS publications—papers for the *Bulletin*, contributions to Society books and monographs, and submissions to be included in preprint volumes. In addition, staff members are enjoined to apply the guidelines to their own writing and editing, the goal being a uniform AMS style that promotes clarity and accuracy in the Society's communications.

This guide primarily covers style issues that are specific to AMS publications. For general stylistic questions relating to proper English usage—in grammar, spelling, punctuation, capitalization, and vocabulary use—that are not covered here, AMS style follows *The Chicago Manual of Style*, 15th ed. (Mahan 2003). For questions of scientific usage that are not covered explicitly in this guide, AMS editorial policy follows the *AIP Style Manual* (1990) prepared by the American Institute of Physics, which is now available online at the AIP Web site. The AMS authority for spelling and word definitions is *Merriam-Webster's Collegiate Dictionary*, 10th ed. (Mish and Morse 1993). For spelling and capitalization of geographical areas, the AMS uses *The Times Atlas of the World, Ninth Comprehensive Edition* (1992).

The style guidelines provided here are generally applicable to all AMS publications, as noted. Authors are encouraged to review the "Information for Contributors" on the inside front and back covers of a recent issue of the respective journal for a quick reference on style issues related to publication in that specific journal.

2. Types of manuscripts

Each AMS journal is divided into two major sections: "Articles" and "Notes and Correspondence." From time to time “Review” articles also appear in the journals. *Monthly Weather Review* also includes "Annual Summary" articles of Atlantic and Pacific hurricane and tropical storm activity and "Picture of the Month"; *Weather and Forecasting* also includes: "NCEP Notes" and "Forecaster's Forum."

Articles are full-length papers that report on new research findings in some detail. More broadly based review articles may be accepted at the discretion of the editors. It is advisable that potential authors contact the chief editor or a co–chief editor of a journal before preparing a review article or an article for one of the previously mentioned special departments; such articles are frequently solicited from known and trusted authors, and over-the-transom submissions may be inappropriate.

Articles should not exceed 7500 words in length (approximately 26 double-spaced pages, counting abstract through appendixes); shorter manuscripts are preferred. Excessively long submissions may be returned to the author at the chief editor's discretion.

Notes are much shorter research papers, occupying a few pages in a journal. There are no specific length guidelines.

The "Correspondence" section is for comments on articles or notes that have previously

appeared in a journal. Correspondence generally consists of a "Comment" on an article or note, often followed by a "Reply" from the original author (see Part I, section 4b).

In the past, individual issues of a journal have been devoted to a particular topic or experiment and were referred to as “special issues,” overseen by guest coordinators. The AMS has adopted a new approach in which “special collections” of articles are assembled and identified at the AMS Journals Online site. Unlike in the past, the individual articles that compose the special collection are published as they are ready, both in print and online, and thus can span different print issues and even different journals. In print, they are identified in the table of contents and with logo icons on the title page. As before, there can be guest coordinators who identify potential papers, work with the authors to shepherd the papers through the peer review process, write a summary editorial or preface, and so on. Approval/assignment of reviewers, processing of reviews, and final acceptance decisions remain in the hands of the journal field editorial staff. Once all of the articles of a special collection have been typeset and published, the organizers have the option of sponsoring a limited digital press run in which all of the articles can be printed within a single cover with a table of contents.

All manuscripts must be written in the English language. Neither AMS editors nor staff have the time available to edit manuscripts that require extensive grammatical changes, as can sometimes be the case with authors from non-English-speaking countries. While the AMS wishes to encourage the international exchange of scientific results through its journals, it requests that such authors make their own arrangements to ensure that submitted manuscripts are already in correct English. If not, their submissions may be returned without review.

3. Components of a manuscript

Manuscripts must be complete when submitted, and *all* pages must appear double spaced on pages of approximately 8.5 in. x 11 in. (28 cm x 22 cm), with wide margins [about 1 in. (2.5 cm) on all sides]. The font size used should be no smaller than 12 point, with a line spacing of no more than three lines per inch. All pages must be numbered consecutively, starting with the title page. Tables and figures should be broken out and included at the end of the text in separate sections, as explained in section 3a; tables should have captions above them and for peer review figures should have single-spaced captions below them. A sans serif font (such as Helvetica or Arial) should be avoided because there can be confusion interpreting some characters (e.g., lowercase "ell" versus the number "one") and the AMS reserves boldface sans serif for matrix symbols.

a. Articles

The manuscript for an article should generally include all of the components listed in the following sections in the order presented here.

1) TITLE PAGE

The title page should include the manuscript's title, the authors' names and affiliations, date of submission, corresponding author address, and, if applicable, a contribution number if the work has been published by the author's institution or funding agency. These items should appear on one page, in this order, separate from the remainder of the manuscript. The affiliations should be as concise as possible and will not constitute a

complete mailing address, but the corresponding author address should be a complete address, *including e-mail address* (both the editor's office and the editorial staff at AMS Headquarters use e-mail extensively to expedite the publication process). The journal editor will add the manuscript receipt and acceptance dates.

2) ABSTRACT

The abstract should summarize the principal conclusions arrived at in the paper and the methods used to reach them. The abstract should be 250 words or less in length, typed double spaced, and should start on a new page immediately following the title page. The AMS tries to adhere to the ANSI/NISO Z39.14 standard for abstracts as much as possible. Therefore, unless absolutely essential, the abstract should contain no mathematical expressions, should include no citations or footnotes, and should not contain first-person sentence structure (see section 4b).

3) TEXT

The text should be divided into sections, each with a separate heading and numbered or lettered consecutively. Section and subsection headings should be typed on separate lines using the following format.

1. Primary heading

a. Secondary heading

1) TERTIARY HEADING

(i) Quaternary heading

New paragraphs should be indented. Avoid starting paragraphs flush with the left margin and separated by a blank line. This sometimes leads to ambiguity and errors in the typesetting of the paragraphs.

Underlining within the text is to be reserved solely for words to appear in italics. Letters representing mathematical variables will be set as italics automatically and should not be underlined. Authors should, however, use italics for these quantities if their word processing capabilities allow. If submitting hard copy manuscripts, mark a single *wavy* underline for vectors [which are set as boldface roman type (e.g., **V**)] and a double *wavy* underline for matrices or tensors [which are set as boldface sans serif type (e.g., **A**)], or set these items directly using these fonts. Mathematical terms not set as italics include uppercase Greek letters, most mathematical functions (such as sin$x$ and ln$x$), and most multiple-character quantities such as relative humidity (RH), Richardson number (Ri), and Prandtl number (Pr). These quantities are set roman so that they will not appear to be products of variables (e.g., so that the relative humidity RH is not confused with R times H). Similarly, subscripts that are words or abbreviations (such as subscripts "model" or "obs") are normally set as roman even when the variable with the subscript is set italic. Authors who follow these conventions within their manuscript (assuming their word processing package provides for it) can expect fewer errors in their page proofs.

Citations in the text may regard standard or nonstandard references. *Standard references* are those that have been published in a refereed scientific or technical journal or a book. *Nonstandard references* are those from unrefereed publications, typically preprints, symposia, proceedings, technical reports, agency or institutional documents, or contract or grant reports. If a nonstandard reference is considered essential by an author, and there is not an equivalent standard reference, the material may be referenced. If the reviewers and editors will need to refer to as yet unpublished manuscripts to understand and evaluate the submission, the author should provide copies of each with the submission. The author should also be prepared to provide copies of nonstandard references at the request of the editor. See section 12 for information on formatting citations in text and the corresponding references.

Information on style and acceptable units, symbols, formulas, and abbreviations is given in sections 4–9; information on figures and tables is given in sections 10 and 11.

4) ACKNOWLEDGMENTS

Keep acknowledgments as brief as possible. In general, acknowledge only *direct* help in writing or research. Financial support (e.g., grant numbers) for the work done, or for an author, or for the laboratory where the work was performed, is best acknowledged here rather than as footnotes to the title or to an author's name. Contribution numbers (if the work has been published by the author's institution or organization) should be included on the title page, not in the acknowledgments.

5) APPENDIXES

Material that is subordinate to the main theme of a paper, such as lengthy mathematical analysis, should normally be omitted. If inclusion is essential, however, it can be placed in an appendix. Appendixes can also be used to define symbols or other terms used in the text. If only one appendix is used, refer to it as "the appendix." If more than one appendix is used, each should be labeled consecutively with letters and referred to in text as "appendix A," "appendix B," etc. Figures, tables, equations, and footnotes that are located in an appendix are labeled according to the appendix letter (use "A" if there is only one appendix), followed by an Arabic number [Eq. (A3), Table B1, Fig. A1, etc.]. Appendixes should be given titles that are centered below the word APPENDIX (or APPENDIX A).

6) REFERENCES

All references referred to in the text are listed alphabetically (see section 12 for more on ordering multiple references by the same author), without numbering, at the end of the manuscript under the heading REFERENCES. References must be complete, in standardized form, and double spaced. See section 12 for more complete instructions on formatting common reference types.

7) FIGURE CAPTIONS

Figures include graphs, illustrations, photographs, computer plots, and line drawings. Each figure should be provided with a legend or caption that makes the figure understandable without reference to the text. Each figure must be mentioned explicitly in the text and must be numbered in the order of first mention in the text.

For the final manuscript, all figure captions should be typed in double-spaced format and should be included in sequence on one or more manuscript pages, attached to the end of the text before the tables. Captions will be typeset and printed below the figure in a font that matches that of the text; therefore, captions should not be incorporated into the drawings, graphs, or other original artwork of the figures. Note that single-spaced captions MUST be included below the versions of the figures that are provided with the reviewers' copies of the manuscripts. (See section 10 for more information on preparation of figures.) The typesetters may not be able to match exactly symbols used in the figure itself, and so the caption should refer to symbols or line types descriptively (such as "open triangle" or "dash–dot line") rather than using the symbols in the caption.

8) TABLES

Each table must be numbered, provided with a legend, and mentioned specifically in the text. Each table should be typed in double-spaced format on a separate page, with an explanatory caption typed above the table on the same page. All tables should be attached at the end of the manuscript, following the figure legends. Generally, tables will be typeset rather than photographed from the author's original copy. See section 11 for more information on the proper preparation of tables. Large tables can become difficult to read when double spaced, and so authors may choose to single space the tables used in the reviewer copies. For the copy forwarded to AMS Headquarters for processing, however, the tables should be double spaced.

9) FOOTNOTES

Footnotes should appear in standard format, double spaced, at the bottom of the manuscript page in which they are cited. Footnotes used on the title page will be set as nonnumerical symbols (*, +, and #). Footnotes appearing in the text of the paper will be numbered consecutively throughout the text. Use of footnotes should be held to a minimum, and potential footnote material should be incorporated in the text whenever possible. Internet URLs, in particular, should appear in parentheses rather than as footnotes, if possible.

b. Notes and correspondence

Notes and correspondence may not contain all the same components as articles. Thus, the author, editor, or reviewer may decide whether a note needs an abstract and whether the text needs to be divided into sections.

An abstract is desirable if the manuscript is longer than two double-spaced pages. Correspondence generally does not require an abstract.

Apart from these minor differences, however, notes and correspondence should be submitted in a format identical to that described previously for articles.

4. Units

Use of the International System of Units [Système Internationale (SI)] is standard in all AMS publications. Although it is the intention of the AMS to adhere as closely as possible to the standard practices associated with SI usage, some special considerations must be given to non-SI

practices that can be defended in the interest of clear communication or on the basis of universal usage within a discipline. In general, the following interpretations and practices will be followed by the AMS.

- Although the SI base unit of temperature is the kelvin (K), the Celsius temperature is widely used in meteorology and oceanography for observational, synoptic, and climatic work. Celsius temperature is equal to the thermodynamic temperature in kelvins minus 273.15 K and is expressed in "degrees Celsius" (°C).

- The SI-derived unit for pressure is the pascal (Pa), but the millibar (mb or mbar) is the unit of pressure often used by meteorologists by international agreement and the decibar (dbar) is commonly used by oceanographers. The pascal [or the appropriate decimal multiple, such as the hectopascal (1 hPa = 1 mb)] is the preferred unit for AMS journals, but the millibar is acceptable so long as the international meteorological community continues to use it officially.

- Logarithmic measures and their units such as pH, dB, dB*Z*, and Np are acceptable.

- Authors should spell out "day" and "month" when used as units. The only exception is in tables where space constraints may dictate abbreviating them to "d" and "mo", respectively, but the table caption or a footnote should indicate that the abbreviation is being used.

- Authors should use the roman capital "L" as the symbol for liter because the printed lowercased "ell," which is recommended under the SI standard, is easily confused for the Arabic numeral "one." The International Committee for Weights and Measures has accepted L as an alternative symbol.

- Although the SI unit megagram (Mg) is preferable, the AMS accepts the use of the term "metric ton" (t). The qualifier "metric" is necessary, however, to distinguish the unit from the British "long ton" and the U.S. "short ton." This unit has also been called the "tonne," but the AMS does not use this form.

- The AMS accepts the symbol "n mi" for nautical mile, although this symbol is not recognized by the International Committee on Weights and Measures.

- In situations in which the use of SI units would seriously impede communication, values expressed in more familiar units may be inserted parenthetically after the SI units. Similarly, in graphs, non-SI units may be used as a secondary coordinate scale if necessary for improving the reader's understanding of the results.

- AMS accepts the symbol "kt" for the unit of speed "knot," representing nautical miles per hour, but the corresponding speed expressed in SI units (normally m s^{-1}) should always be indicated as well.

Units should be set in roman font with a space between each unit in a compound set (e.g., m s^{-2} rather than ms^{-2}). Avoid using the solidus (/) to form unit combinations; use negative exponents instead (e.g., write m s^{-1} rather than m/s). Words and symbols for units should not be

mixed; if mathematical operations are indicated, then only symbols should be used. For example, one may write "joule per mole" or "J mol^{-1}," but not "joules $mole^{-1}$," "joules mol^{-1}," or "J $mole^{-1}$." When numerical values are included in a unit combination (as is sometimes done when representing change over a vertical layer, such as a lapse rate), care should be taken be sure the combination is clearly stated. For example, use °C $(100\ m)^{-1}$, not °C/100 m.

Number–single-unit combinations used as modifiers should be hyphenated following the *AIP Style Manual* (1990). For example, we would hyphenate 500 hPa when referring to the "500-hPa temperature."

5. Style

a. Basic writing style

The need for brevity and clarity in writing has never been more acute. Johnson and Schubert (1989) pointed out almost 20 years ago that article length in AMS journals had nearly doubled in the preceding 20 years, and the situation has not improved much since then. Instead of simply publishing longer articles or articles broken up into multiple parts, they argued, "A more attractive goal is conciseness in writing and presenting research results (not to the exclusion of essential details)." Authors who wish their work to be read, understood, and referenced must write in a clear, terse style. Geerts (1999) echoed these sentiments and provided an analysis indicating that AMS journals are becoming less readable. Several suggestions leading to improved clarity are made by Geerts (1999), and authors are encouraged to read his paper, which is freely available through the AMS Journals Online site.

Manuscripts may be rejected for publication if they are considered to be poorly written. Indeed, one of the five criteria on which reviewers base their evaluations of a research paper is the clarity, conciseness, and organization an author shows in his or her presentation (see Part I, section 4a). Although editors and reviewers may offer advice on how the style and organization of a manuscript may be improved, it is not their function to rewrite manuscripts. Authors are advised to consult a good general style manual, such as *The Chicago Manual of Style*, 15th ed. (2003), which is used as the primary general style guide at the AMS. Authors whose first language is not English should seek the help of someone well versed in the English language. Indeed, those whose first language *is* English could often benefit from critical reading of manuscripts by colleagues.

b. Impersonal construction and passive voice

Use of the first person in sentence construction should normally be avoided in the body of the manuscript. This can often be accomplished quite naturally, through the use of passive construction, when stating facts. For example, use "the rainfall rates were measured using . . ." rather than "I measured the rainfall rates using . . . ." The use of "we" is appropriate where it politely includes the reader, such as "We have already seen . . . ."

The first person should be used when directly stating opinions of the authors so that it is clear that these opinions may not be held universally. For example, the statement "It is believed that this phenomenon is a result of . . ." implies this is a widely held belief, whereas "We believe that this phenomenon is a result of . . ." clearly refers to the beliefs of the authors.

The first person may also be appropriate when comparisons are made to the work of others or when reporting on decisions that were made. For example, ". . . our calculated values are larger than those of Smith et al. (1998) . . ." or ". . . in view of the limitations of this approach we chose to use the following . . . ." The acknowledgments are also a natural place for authors to use first-person construction.

As noted in section 3a, impersonal construction should be used in the abstract of a paper. The main reason for this is that the abstracts are disseminated in a variety of resources, such as *MGA*, in both print and electronic databases, that often consist of a mixture of author-prepared and third-party abstracts. The use of "I" or "we" can be confusing in this context, and so use of "the author(s)" or impersonal construction is recommended.

c. Spelling, punctuation, and capitalization

As a primary guide, the AMS uses *Merriam-Webster's Collegiate Dictionary*, 10th ed. (1993), for the correct spelling of words. A technical field such as meteorology or oceanography often has terms not present in the dictionary, however, and dictionaries often lag behind usage as terms evolve. To handle these more technical situations, the AMS editorial staff uses the American Institute of Physics' *AIP Style Manual*, 4th edition (1990), and has created a word list to give consistent spelling of technical terms. This word list is included in appendix A. The editorial staff monitors author usage of terms to identify words that appear to be evolving and may make changes to the word list to reflect this (often with input from the journals' chief editors).

Oxford English spellings will be changed to the appropriate American spelling in all instances except for proper names (such as the European Centre for Medium-Range Weather Forecasts).

In general, the guidelines of *The Chicago Manual of Style*, 15th ed. (2003) are followed for determining the hyphenation of terms. Appendix A gives many examples of hyphenated terms (especially those used as modifiers) in the word list and also provides information on the hyphenation of common prefixes and suffixes.

Serial commas should be used before the conjunctions "and" or "or" in a list of three or more items. Commas are not used in numbers except when the number refers to a monetary amount (e.g., $10,000). For numbers with more than four digits, a space is inserted where the comma would normally appear (e.g., 4000, 10 000). A space is also inserted in decimal numbers with more than four digits (e.g., 0.001 234).

The proper names of locations and phenomena are capitalized (e.g., Lake Erie, the Gulf of Mexico, the Appalachian Mountains, the Gulf Stream). Regions and regional phenomena are considered to be proper terms and are capitalized (e.g., Lower Michigan, the Sun Belt, the Piedmont, the Great Plains, the Denver Cyclone). Note, however, that reference to these locations or phenomena by an abbreviated form of the name is lowercase. That is, we say "the Tibetan Plateau" (capitalized) and can refer to it later as "the plateau" (lowercase), or we can discuss "the Labrador Current" and later we could refer to it as "the current." There are a very few cases in which an abbreviated form of the name of a geographic location can also be considered a proper term. The AMS recognizes, for example, "the Gulf" as a proper term

referring to the Gulf of Mexico, but this abbreviated form should only be used after the full form has been used and should not be used if there is any potential for misunderstanding (i.e., if more than one gulf is referred to in the paper). Northern Hemisphere, Southern Hemisphere, Eastern Hemisphere, and Western Hemisphere are all capitalized. The tropics, extratropics, and subtropics are written lowercase.

6. Mathematical expressions

Since correct typographical presentation is crucial to understanding equations, authors of mathematically oriented papers should prepare their manuscripts carefully to ensure correct and efficient typesetting. If final submission is by hard copy, then before sending the final revised manuscript to the chief editor, the author should read for legibility, and if the author feels there is any chance that a symbol might be misread, such as misinterpreting a Greek rho for a roman *p* or a Greek nu for an italic *v*, the symbol should be identified with a notation in black pencil. It is generally sufficient to mark only the first occurrence of a special symbol, and papers prepared with good scientific word processing software rarely need additional marking. Such identification of symbols is imperative if symbols or equations are handwritten, but even perfect typing or the use of scientific word processing software does not always obviate this requirement. The letter "l" (ell) and the number "1" (one) are often hard to distinguish, and so the author must make certain it is clear which is intended. [This shows up most critically in equations that may contain both 1 (one) as a number and l (ell) as a wavenumber.]

The author should be aware that photocompositors such as those employed by the AMS have the capability of handling complicated mathematics and maintain sets of alphabets that include such added symbols as single and double overbars, tildes, carets, dots, etc. (see Fig. 4). Authors should feel free to use these alphabets and special symbols but should make certain their manuscript clearly indicates what is desired.

There are other important factors, however, in manuscript marking by the author. These include typeface and type font, particularly with respect to the use of vectors, matrices, and tensors. As stated earlier, if hard copy is submitted, vectors should be identified by a single *wavy* underline, which will be set as boldface roman type (e.g., **V**), and matrices and tensors should be identified by a double *wavy* underline, which will cause them to be set as boldface sans serif (e.g., $\mathbf{A}$). No other mathematical symbols should be underlined.

Every equation or set of equations, except for very short single-level equations that can be set in the text, should be displayed—that is, centered on its own separate line. Not all display equations need to be numbered, but those that are must be numbered consecutively, with the numbers in parentheses set flush right against the margin. The AMS discourages use of sectional numbering of equations [(2.1), (2.2), … , (2.8), (3.1), (3.2), … , (3.8), etc.] but does not prohibit it. Appendix equations must be numbered without a period (unless using section-number style) and preceded by the letter of the appendix: (A1), (A2), (B1), (C1). In text, equations are referred to within parentheses as Eq. (1), (1), Eqs. (1)–(3), (1)–(3). The author may use or omit the abbreviation Eq. but must be consistent throughout the text as to which style is followed. Simple fractions appearing in the text, but not in displayed equations, should use a solidus and parentheses if necessary to avoid ambiguities. That is, use $\mathbf{1/(\boldsymbol{a} + \boldsymbol{b})}$, not $\mathbf{1/\boldsymbol{a} + \boldsymbol{b}}$. The following order should be used: parentheses, brackets, braces, and angle brackets <{[( )]}>. When more than four groupings are involved, the sequence should be repeated. Identify special usage of

AMS Fonts and Special Characters

Roman:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z
1 2 3 4 5 6 7 8 9 0 ! @ # $ % & * ( ) ; : , . ‘ ’ ″ [ ] { } + − ⟨ ⟩ > <

Italic:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z
*1 2 3 4 5 6 7 8 9 0 ! @ # $ % & * ( ) ; : , . ‘ ’ ″ [ ] { } + − ⟨ ⟩ > <*

Bold:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z
1 2 3 4 5 6 7 8 9 0 ! @ # $ % & * ( ) ; : , . ‘ ’ ″ [ ] { } + − ⟨ ⟩ > <

Bold Italic:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z
1 2 3 4 5 6 7 8 9 0 ! @ # $ % & * ( ) ; : , . ‘ ’ ″ [ ] { } + − ⟨ ⟩ > <

Script (not available in roman, bold, or bold italic):

ℓ 𝒜 ℬ 𝒞 𝒟 ℰ ℱ 𝒢 ℋ ℐ 𝒥 𝒦 ℒ ℳ 𝒩 𝒪 𝒫 𝒬 ℛ 𝒮 𝒯 𝒰 𝒱 𝒲 𝒳 𝒴 𝒵

German (not available in italic, bold, or bold italic):

𝔄 𝔅 ℭ 𝔇 𝔈 𝔉 𝔊 ℌ ℑ 𝔍 𝔎 𝔏 𝔐 𝔑 𝔒 𝔓 𝔔 ℜ 𝔖 𝔗 𝔘 𝔙 𝔚 𝔛 𝔜 ℨ
𝔞 𝔟 𝔠 𝔡 𝔢 𝔣 𝔤 𝔥 𝔦 𝔧 𝔨 𝔩 𝔪 𝔫 𝔬 𝔭 𝔮 𝔯 𝔰 𝔱 𝔲 𝔳 𝔴 𝔵 𝔶 𝔷

Sans Serif, Bold:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z

Greek:

Regular (not available in Sans Serif):

α β ψ δ ϵ ϕ γ η ι ξ κ λ μ ν ο π ϑ ρ σ τ θ ω ς χ υ ζ
Α Β Ψ Δ Ε Φ Γ Η Ι Ξ Κ Λ Μ Ν Ο Π Θ Ρ Σ Τ Θ Ω φ Χ Υ Ζ

Bold (not available in Bold Sans Serif):

α β ψ δ ϵ ϕ γ η ι ξ κ λ μ ν ο π ϑ ρ σ τ θ ω ς χ υ ζ
Α Β Ψ Δ Ε Φ Γ Η Ι Ξ Κ Λ Μ Ν Ο Π Θ Ρ Σ Τ Θ Ω φ Χ Υ Ζ

Fig. 4 (2 pages)

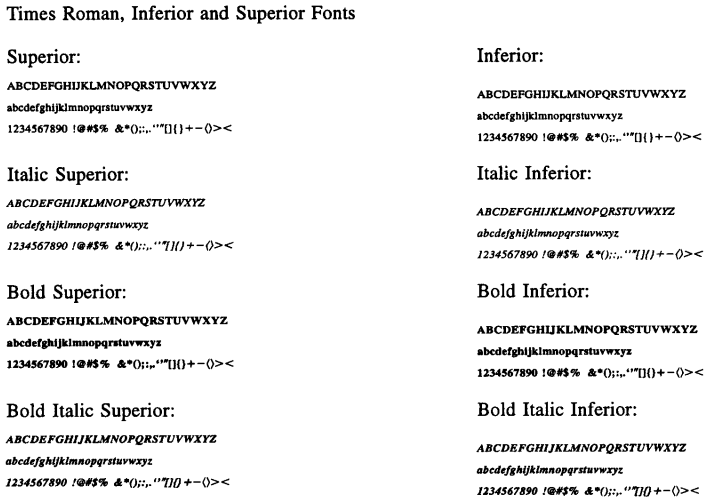

Fig. 4 (continued)

brackets (e.g., < > to mean some type of average) when they first appear so that it is clear that the unusual order is intended.

The use of the exponent ½ is preferred to the radical sign (√). Also, the use of negative exponents is preferable to fractions made with a solidus—that is, write $ax^{-1}\cos y$ rather than $(a/x)\cos y$. If a paper has large numbers of notations and symbols, it is recommended that the symbols be listed in an appendix to the manuscript, with short explanations for each symbol. Use "exp" for expressions involving *e* modified by a complicated exponent.

The following symbols should be used to represent these common mathematical phrases.

≈	approximately equal to
∝	proportional to
→	tends to
~	asymptotically equal to
$O(\ )$	on the order of
$\mathbf{A}^*$	complex conjugate of **A**

A more complete discussion of the proper use of mathematical and physical symbols and equations can be found in the *AIP Style Manual* (1990, appendix F).

Because of AMS typesetting requirements, authors who use Microsoft Word to prepare their manuscripts are asked to use MathType version 5 to prepare their display equations, rather than making entries from the keyboard, and to avoid the use of MathType entirely in running text, using the keyboard exclusively except to create overbarred variables or variables with stacked super/subscripts that cannot be easily created from the keyboard. For display equations, the equation numbers, if any, should be entered from the keyboard, but all other parts of the equation should be in MathType. Following these requests will greatly reduce production time for mathematics-heavy papers.

7. Abbreviations, acronyms, and numbers

Apart from standard abbreviations, which are listed in appendix B, abbreviations (including most initializations and acronyms) should be defined at their first use in the text, such as "National Climatic Data Center (NCDC)." Since the abstract is printed separate from the article in secondary sources, such as *MGA*, abbreviations should be defined in both the abstract and the first occurrence in the text. When many acronyms or initializations are used in a paper, a list of their expansions as an appendix can be an effective aid to readers. Only very well-known and established acronyms or initializations, such as NASA, CISK, or GFDL, should be used in the title of the manuscript.

Numbers should be spelled out in text through nine and written as a numeral from 10 on. An exception to this is when a sentence includes numbers in the same context that are both above and below nine, in which case the numeral form should be used throughout. For example, use "2 out of 14 cases" rather than "two out of 14 cases." Numbers should also be spelled out when they

start a sentence. Following the latest version of the *Chicago Manual of Style*, AMS now represents the ordinal numbers for second and third by “nd” rather than the "d" alone when used in numerals (e.g., 22nd or 23rd); and ordinals, as with cardinal numbers, are normally spelled out for values below 10th.

8. Date and time conventions

Day, month, and year are written in the form "29 March 1993" in AMS publications. Do not abbreviate the names of months. The recommended time zone annotation system is coordinated universal time, abbreviated UTC, which should be used in nearly all circumstances. Time, time zone, day, month, and year are written in the form "1409 UTC 29 March 1993." The use of other time zones [e.g., EST, EDT, PST, LST (local standard time), or LT (local time)] is permissible if it significantly adds to the interpretation of the material, but they should be defined on first use. Do not use Z or GMT in place of UTC. Astronomical or military time (i.e., a 24-hour clock) is required. No colon is used between hours and minutes; a colon is included to separate minutes from seconds (e. g., 0537:15 UTC).

The month is always spelled out completely when dates are included in regular text. In figure captions and tables, however, the month is abbreviated to its first three letters to conserve space when it appears in a date (e.g., "23 Jan" or "17 Mar 2008") but is spelled out in narrative uses in captions (e.g., “data cover January and February 2008”). Authors may want to use a similar convention in figures for consistency.

For year ranges, do not include the century in the second year unless a transition of centuries is spanned (e.g., "1988–92" but "1887–1932"). A solidus is appropriate for indicating the calendar year transition for a period of less than two full years, and the century of the second year should be omitted unless the century changes (e.g., "the 1988/89 winter," "the 1974/75 experiment period," but "1899/1900 winter").

9. Latitude and longitude

Latitude and longitude pairs should be expressed in that order, for example, 41°N, 136°W. For locations on the globe at the equator, the Greenwich meridian, or 180° longitude, omit the hemisphere letter (e.g., 0°, 154°E; 33°S, 0°; or 57°N, 180°).

10. Figures

Figures allow the reader to see both the actual data and the relationship between different sets of data. Figures should be prepared to emphasize points made in the paper and should not merely illustrate tabular material in graphical form. Well-prepared figures, properly reproduced, attract the reader's attention to a more easily understood source of information. A checklist and summary of important information for the preparation of figures is mailed to authors by the editorial office after submittal of the manuscript (and is shown in Fig. 5). Note again that figures for peer review should have single-spaced captions immediately below each figure and that the electronic final publication-quality figure files should have no figure numbers or captions associated with the image (AMS no longer requires that hard copy figures be submitted, but if they are then AMS recommends that captions be omitted to reduce processing time and costs if they must be scanned). A separate double-spaced caption list is provided with the manuscript.

Checklist for Final Illustration Preparation

When preparing final originals of figures for submission to AMS journals, authors should keep in mind the impact that reduction of illustrations to journal size has on detail, particularly thin lines and small symbols and lettering.

It is recommended that authors test the intended size by reducing illustrations to journal size, that is, column, three-quarter page, or full-page width, and examining if details of the figure are legible/suitable at the journal size. Avoid using previously scanned illustrations if possible.

Panel letters should be close to the upper-left corner or within the illustration so that the figure detail is not needlessly reduced to include the label. As an alternative to panel letters on illustrations, descriptive wording such as upper (lower), left (right), top, middle, or bottom may be used in text and figure captions although letters are preferred. For line drawings Allen Press uses a 1200-dpi scan; scan rate should be at least 600 dpi. For color illustrations CMYK is their standard.

‘ ___The size of submitted figures should closely approximate the intended published size.

‘ ___Uppercase lettering and numbers for coordinate labeling and graphic symbols used within illustrations and legends should be at least 1.5 mm after size reduction and other internal labeling, such as for isopleth labeling, should be at least 1 mm.

‘ ___Line thickness should be at least 1/2 point, or 0.1 mm after reduction to journal size.

‘ ___Stipple dot size and density should be large enough to allow adequate resolution when scanned (note that small dots/light shading may disappear and large dots/heavy shading may appear solid). A screen or mesh size of 120 is suitable at 100% size; 60 if reduced 50%. Note that 70% and 90% fill values may both appear as black.

‘ ___Grayscale resolution intervals should not be less than 20%. Including clear and solid, this allows six grades of resolution; less than 20% may not be distinguishable.

‘ ___Nonessential information, internal grid and external border rules, and redundant headers that appear in the figure caption should be omitted from the graphic illustration.

‘ ___Figure citations in text must be in numerical sequence (although preliminary citations to later figures may be made parenthetically).

‘ ___Captions should match illustrations.

‘ ___A second/backup set of illustrations must be submitted with manuscript.

‘ ___Cost for printing color illustrations should be included in the purchase order. Note that color scanning costs are per piece, so that combining multiple panels for one figure onto a single page as one piece reduces the cost; each numbered figure is scanned as a separate piece.

Please check off the items on this figure checklist and return it with the final set of original figures. Thank you.

Fig. 5

There are basically two kinds of figures: line drawings and continuous-tone photographs. Instructions are given in the following sections for the preparation of each in both hard copy and electronic form.

a. General instructions

Figures should be carefully designed with attention to the fact that they normally appear in the journals in one of three widths: a single-column width of 7.9 cm (3.125 in.), a double-column width of 16.5-cm (6.5 in.), or a medium width between these two. A figure whose maximum dimension is 22.9 cm (9 in.) may be placed broadside (landscape) on the page (as long as it does not exceed the 16.5-cm page width). Broadside orientation is inconvenient for readers, especially in the online presentation, and so the technical editors will use broadside orientation only when it is absolutely necessary.

Any hard copy figures supplied should be carefully identified in a location that does not interfere with the reproduction of the figure, preferably on the back, with a figure number and the author's name. If identification is written on the back of a photograph, write lightly with a blue pencil. Please be sure to indicate which panel(s) of a multipanel figure are represented on each piece (e.g., one sheet may contain Figs. 3a–c while a second piece may contain Figs. 3d–f). Also indicate figure orientation on the back if there could be any question as to which is top or bottom. Electronic files should be named with the figure number and the paper number contained in the file names to avoid tedious and time-consuming mapping of complicated file names to their corresponding figure number at production stage.

Attempt to prepare related figures as a group. That is, if a series of sequential maps of the development of a storm are included, they could be offered as Figs. 1a, 1b, and 1c, all aligned vertically in a column and each designed to fit within the 7.9-cm width, or as side-by-side panels using the full page width. The lowercase identifying letters (a, b, c, etc.) for each panel should appear in an upper corner (usually left) just above or just inside the panel. Do not place an identification letter so far outside the figure panel that the figure must be reduced additionally just so that the panel letter will fit inside the column or page. To the extent possible, group panels of a given figure all on one page or in one file. This will reduce publication costs, particularly for color.

Authors should place the identification letters on figure panels, but this also can be done as part of the typesetting process at the discretion of the technical editor. Never place the figure number within the figure itself. Do not include a border around a figure panel unless it is necessary. Titles on the top of figures should be avoided if they duplicate information in the captions.

b. Line drawings and figures created using computer graphics

Illustrators who prepare line drawings should model their work on well-designed figures published in recent issues of one of the AMS journals.

Line drawings can be either manually drafted or computer generated. If hard copies are to be submitted, they should be made with India ink or printed on a laser printer with a minimum of 300-dots-per-inch (dpi) resolution and should be made on a material that provides maximum black–white contrast with sharp edges and sufficient line thickness to withstand reduction.

Glossy photographic prints of final drawings are preferred if they are of high quality, with sharp, even lines and lettering. Any blurring in a photograph will be further exaggerated in the printed form. Low-quality prints will be rejected, and commercial plain paper photocopies are often unacceptable substitutes for original drawings or prints.

Symbols and letters should be drawn so that the smallest will be at least 1.5 mm tall after reduction (though lettering can often be as small as 1 mm after reduction and still be very legible). A drawing that is 16 cm wide may be reduced to half of its original size to fit in one column of a journal; in this case, the smallest symbols and letters should be at least 3 mm high in the original. Authors must design figures so that they are legible within these limits. Figure 6 shows a drawing that, after reduction, has lettering that is too small for ease of reading and understanding. Figure 7 shows an example of a graph with clear lettering and an appropriate legend within the figure.

Lettering should be simple in style, without serifs and with open areas that stay open with reduction (for instance, the open area of the number "6"). Freehand lettering is never acceptable. Most figures are currently computer generated and output on laser printers or with a plotter. Keep in mind that scalar variables in text will be set italic and vectors will be set boldface regular font and that units and other related items will be set to AMS style in the text and captions. Following this same convention in any labels that may occur in figures will improve the correspondence between the figure and the text.

Authors should try to avoid great disparities in the thickness of lines and in the size of symbols and letters. This has become a common problem with the advent of computer plotting routines that allow a wide variety of letter fonts and sizes to be used in the same figure. Major disparities are awkward in themselves and are not eliminated by photographic reduction in the printing process. Thus, thin lines may be broken or lost upon reduction. The thinnest line that can be reproduced consistently well after reduction is 0.5 point thick (approximately 0.017 cm or about 0.007 in.), and so authors should routinely set their graphics programs to create lines at least twice as thick as this. Open or half-closed symbols tend to close up or become indistinct on reduction, so they should be drawn slightly larger than comparable symbols that are closed. Letters used for subscripts and superscripts should be approximately 75% of the size of the principal lettering.

Do not use open symbols with dots in them since they may appear to be filled symbols after printing. To ensure legibility after reduction, give decimal points a diameter about 1.5 times the thickness of the lines in the lettering.

Graphs should be self-explanatory, their purpose being evident without reference to the text. One should indicate clearly what is being plotted, on both the vertical and horizontal axes. The figure caption should provide sufficient information for the reader to understand what the figure is intended to show. Coordinate rulings should be limited in number to those necessary to guide the eye in making a reading to the desired degree of approximation. Ticks to indicate coordinate values may be placed on all four sides of the graph to increase readability and are recommended. Place numbers and letters so that they may be easily read from either the bottom or the right-hand side of the graph.

Relevant nongraphic material, such as keys to the symbols in the graphs, may be included

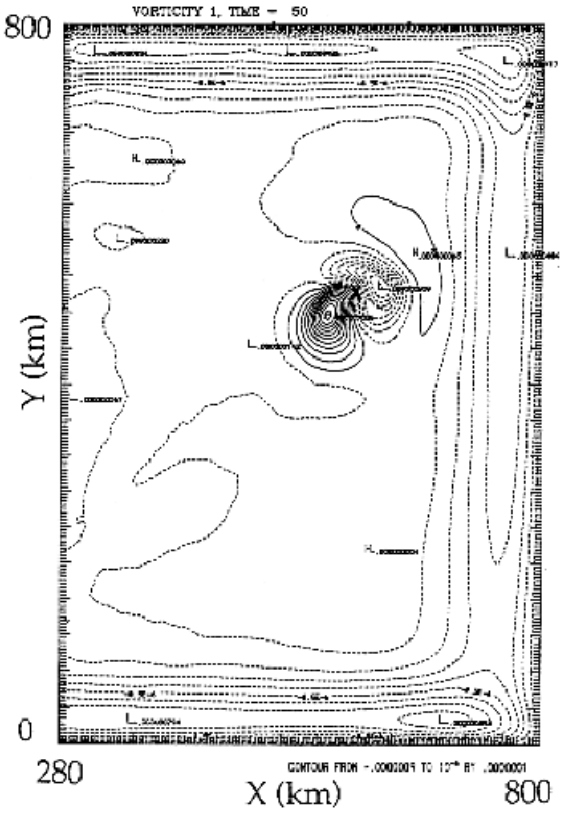

Fig. 6

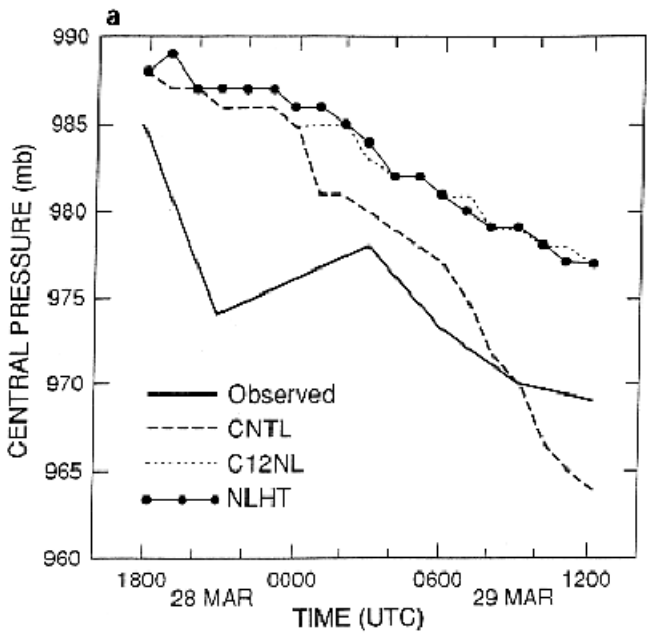
a
990
985
980
975
970
965
960
CENTRAL PRESSURE (mb)
Observed
CNTL
C12NL
NLHT
1800
28 MAR
0000
0600
29 MAR
1200
TIME (UTC)

Fig. 7

in the graph itself if it fits without too much crowding (see Fig. 7). Otherwise, such material should be in the caption. Take care to preserve standard forms for symbols and abbreviations, particularly of units. Symbols of SI units should be lettered as lowercase or capital letters as specified by the SI standard, and variables or vectors used in the figure should be set in italic or boldface nonitalic font, respectively, following the style that will be used in the text.

Shading in figures in the form of screens or halftones (i.e., gray shades made up of small dot patterns) can sometimes reproduce poorly as a result of the scanning process used at press. Very small dots may not be picked up, ink bleed may cause nearly black areas to become black, and aliasing between the original's dot resolution and that of the scanner can result in moire patterns in the final printed image. These difficulties can be avoided by using a "screen" or "mesh" size no finer (after reduction) than 70 lines per centimeter (175 lines per inch) and by using "fill" densities that are not less than 10% or greater than 70%. Computer-generated figures using screens or halftones should be printed on a laser printer with at least 600-dpi resolution (or the screens should be set coarser than indicated here). If hard copies are submitted, please submit the original figure generated by the computer printer and not a photocopy of it to ensure the best possible reproduction.

Diagonal or cross-hatch lines for shading often reproduce best. Figure 8 shows an example in which both screening and cross-hatching were used effectively.

c. Continuous-tone photographs

Continuous-tone photographs are standard color or black-and-white prints, such as one gets back from the photo laboratory; they are characterized by virtually continuous variation in color or shades of gray. This continuous variation is impossible to reproduce in the printing process; photographs are printed instead using halftone reproduction. In this process, the photograph is converted to a pattern of dots through a scanning process. The quality of the reproduction depends on the scanning resolution and the type of paper used for printing. A technical editor may choose to print a section of the journal issue on coated (glossy) paper in order to improve the print quality of halftone photographs in that section of the journal.

Ultimately, the quality of reproduction depends on the quality of the original photograph submitted. Photographs should be clear and crisp, with details sharply in focus. If submitted as hard copies, they should be on glossy paper. Since contrast is often lost in reproduction, the original photograph should have somewhat more contrast than is desired in the printed photograph.

Continuous-tone photographs submitted with superimposed screens, thin lines, or very small lettering are very difficult to process and may not reproduce well. The interaction between the dot pattern on a superimposed screen and the halftone pattern created during the scan can yield moire patterns. The halftone process also blurs somewhat the edges of superimposed lines or lettering, and this is much more noticeable in the final printed reproduction if the lines were thin or the lettering small. Thus, lettering used to identify components directly on a photograph should be large and boldface so that it will withstand both reduction and the halftone process. Lettering should contrast with the background—that is, black lettering should be put on a light background, and white lettering on a dark background.

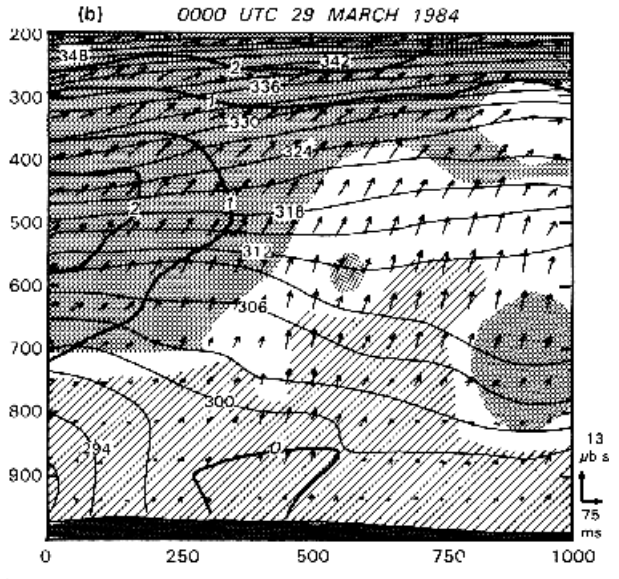
(b) 0000 UTC 29 MARCH 1984
200
300
400
500
600
700
800
900
348
342
336
330
324
318
312
306
300
294
288
13
μb s
75
ms
0
250
500
750
1000

Fig. 8

Photographs of standard equipment in a laboratory are not instructive and should not be submitted. A good line drawing of the apparatus, amply and clearly labeled, is almost always more informative than a photograph.

d. Color illustrations

The journals and *Bulletin* regularly publish color photographs and illustrations. Authors should be aware that color illustrations are considerably more expensive to reproduce than black-and-white illustrations. Although black-and-white photographs can be included in a manuscript with no additional page charges, the high cost of processing and printing color images requires a substantial increase in the page charges passed on to authors. Author charges for color illustrations are made by the "piece" rather than by the page or figure, which reflects the structure of the costs incurred by the AMS. A piece is defined as a figure if it is all one photographic print or piece of paper or any loose portion of a figure, such as a figure panel submitted separately from other panels of the figure. Multiple figures on a single piece will be charged separately. Remakes of black and white figures not necessitated by press error cost approximately $20 each; for color figures the charge for a remake is approximately $50.

Authors may want to plan their color figures in ways that reduce the number of pieces, such as having multiple-panel figures laid out and shot as a single photographic print. Care should be taken, however, to ensure that a multiple-panel figure of this type will accommodate layout on a single page. Also, authors should not submit more than one numbered figure on a single piece, even if the figures are consecutive in number (authors will be charged for each figure in these cases). This is because the page layout may require the figures to appear on separate pages, and even if they appear together each figure must have a caption added to it. Multiple-panel figures that must span two facing pages must be submitted as at least two pieces to allow this layout.

In general, all figures should be submitted at the size they will appear. The best reproduction of color figures is often a result of the author submitting figures as electronic files (if they were originally generated in electronic form) (see section 10e).

Current author charges for color, which are assessed in addition to the regular page charges for the article, are $490 for the first piece, $390 for the second piece, and $150 for each additional piece. The higher charges for the first two pieces incorporate the costs associated with the press setup for color. The press costs for additional color production in the same article are small, and the charge per piece after the third piece reflects mostly the color separation charges for that piece.

Charges for color in articles published in the *Bulletin* are incorporated in the page charges. Color covers for the *Bulletin* are more expensive to produce and have a charge of $2050 to authors supplying the color cover. (Contact the *Bulletin* production manager for more information on supplying cover illustrations and for page charge information.)

Figures that contain just one or two colors in addition to black and white do not offer savings in processing or printing in comparison with full color figures. Author charges for these figures are, therefore, the same as those for full color figures.

Because of the high cost, authors may wish to seek alternatives to color where possible. It

should be noted that while the inability of an author's institution to honor page charges will not prevent publication of a paper, an attempt is made to secure a commitment to the page charges prior to processing color illustrations. If page charges cannot be honored, the technical editor of the journal will work with the author to find a suitable way to present the illustrated material in a black-and-white format.

e. Electronic submission of figures

It is now possible for the AMS to take advantage, in many cases, of the electronic files used by authors to create computer-generated figures directly in the composition process. Using these files can often lead to a higher quality of reproduction in the journals. The following serve as guidelines for electronic submission of figures. Authors can contact the technical editors at AMS Headquarters if they have questions. The following general guidelines apply.

- Authors can use the AMS Web site and its manuscript upload system to upload their original electronic figures at the time of submission or at any time afterward. Authors may wish to wait until after the first round of peer review in case the number or content of the figures changes. If the figures have not been uploaded by the time that Headquarters is notified that a manuscript is accepted, then the author will be contacted to do so, if electronic figures are available. Note that uploading original print-quality (preferably captionless) electronic figures is a distinct step from submitting captioned peer-review electronic figures as part of the peer-review manuscript submission, although they can be done simultaneously if desired.

- Authors should submit their files in electronic form only if their figures were created that way to begin with—that is, authors should not submit scanned images of hard copy figures because the AMS typesetters can, in general, process those hard copy figures in ways that optimize their reproduction in the printed journal. Also, figures created with vector graphics should be submitted as files with the vector information rather than as bitmapped image files. Note that an author can submit scanned versions of the captioned peer-review figures if the rest of the manuscript is also being submitted electronically, if needed.

- Authors are no longer required to supply high-quality print-copy original figures, but may do so if they wish. If problems arise with electronic figure files, the PDF versions used for peer review (see section 14) will be scanned. The electronic figures must match these PDF versions because technical editors often use the PDF file to determine figure sizing and because the press looks at the PDF file as a quality check. Differences may result in production delays. The figure files will be requested at manuscript revision stage or before acceptance if not already present, and they should be submitted through the upload system as auxiliary files.

- As with all figures, authors should take care to consider the final size and layout of the figure. Most figures will be reproduced at either column width (7.9 cm, or 3.125 in.) or double-column width (16.5 cm, or 6.5 in.). The electronic file should contain the figure at a size as close to final reproduction size as possible. All text, including axis labels, contour labels, and symbols, should be sized so that it will be easily readable at the final reproduction size, and authors should avoid use of text of very

different size within the same figure.

- Authors should make sure that the electronic representation of the figure is closely cropped both vertically and horizontally. That is, the electronic representation should contain as little white space around the figure as possible.

- Each figure should be saved as a separate file with a logical name that contains the paper number and the figure number and that will help the typesetter identify the correct file for each figure.

- Most common file compression formats (such as WinZip, tar files, gzip) are acceptable for reducing the size of transferred files and can be handled by AMS. If AMS cannot unpack the files, it will request a new set of uncompressed files.

- If the graphics software used allows compression at the time of output as an encapsulated PostScript (EPS) file, this option should not be used. Instead, output the file without compression and then, if necessary, use a separate compression routine on this file.

Electronic graphic files must be submitted as TIFF or EPS files. Color images should be saved in CMYK mode, not RGB. The RGB color image can be converted to CMYK by the press, but there will be a compression of the color range. Please note that ordinary postscript (PS, .ps) is not acceptable. To ensure usability of files, authors should achieve a resolution of 300 dpi for grayscale and color figures and 1200 dpi for line drawings.

Authors who wish to check in advance whether their files may cause problems at typesetting can use the Digital Expert software found at our printer's (The Sheridan Press) Web site: http://dx.sheridan.com. This software can detect minor problems such as fonts that are not embedded, RGB instead of CMYK color, and low resolution as well as more major problems that will render a figure file unusable.

Figures will be transferred to the AMS server through the AMS Web-based upload system (section 14). If revised figures need to be submitted after page proofs are received, they can be uploaded through the Web system, attached to the proof e-mail, or attached to the marked-up electronic PDF proof.

11. Tables

Tables are a commonly used method of presenting information in AMS journals. Their arrangement and conciseness greatly aid in the understanding and transfer of information to the reader. Tables can be judiciously arranged to minimize use of space, a subject of concern to editors, authors, and readers.

Each table should be typed in double-spaced format on a separate page, and tables should be located at the end of the document. Tables are to be numbered consecutively using Arabic numerals in the order they are mentioned in the text. No table will be accepted unless it is mentioned in the text. All units of measure in tables should be SI units (see section 5 for limited exceptions).

The general style of tables for the AMS journals is shown in Tables 1, 2, and 3. Tables that can fit into one journal column are a particularly efficient use of space (see Table 1, shown embedded in a typeset journal page), but wider tables can be set for the full-page width (see Table 2, also shown as it would appear in a typeset journal page). If abbreviated column headings are used to allow a table with several data columns to fit in one journal column, provide definitions of the abbreviations as footnotes, as in Table 3 (shown formatted as might appear in an author's raw file), or as part of the caption so that readers need not search through the text for definitions, especially if the definitions have not already been defined in text.

A good table is nearly self-explanatory because of well-chosen column headings and sufficient text in the table heading. The units for all entries should be clearly indicated. A single table footnote is indicated with a superscript asterisk, as in Table 2, and a second table footnote is indicated with two asterisks. If there are more than two footnotes, lowercase superscript letters should be used instead of asterisks.

Each table should have a double-spaced caption that is positioned at the top of the table. Captions should be brief but sufficient to make the table contents clear. Column headings should be clear and concise. Capitalize the first word of a heading but use lowercase letters for all other words except proper terms. AMS technical editors at editing stage will specify the correct rules for tables (double rule between caption and table, and single rule between header and table body and at bottom of table), however authors may provide guidance or additional desired rules to AMS by formatting the raw file. Use horizontal lines in tables only to separate headers from the body of the table, as shown in Tables 1–3, and not between each line of the table. Do not use vertical lines but instead use appropriate spacing. A blank line is preferred over a single rule to separate blocks of data within a table that the author wishes to group together. AMS does not allow shading or color in tables, except in rare cases in which the table is handled as a figure and typeset as submitted. Italics and boldface can be used to set off cells, columns, or rows of interest, with the meaning defined in the caption or footnotes.

12. Citations and references

a. General guidelines

Much of the cost incurred during the corrections made to the page proofs are associated with updating the references (and often the corresponding text citations). In some cases, this cannot be avoided since additional information on recently published articles may not have been available at the time the author completed the revisions to the manuscript. In many cases, however, the author has supplied incomplete references or has not included references that were cited in text and this information needs to be requested of the author on the page proofs. If authors take care to ensure that their references are complete at the time the revised manuscript is sent to the editors both time and money can be saved during composition.

The AMS editorial staff puts much emphasis on getting the references correct for several reasons. First and foremost, the references are intended to lead readers to other relevant work and if they are not complete or are in error, readers may be unable to find the material being cited. Also, the reference section is used for citation reports, which have become increasingly important as a measure of the impact of an author's work. Incorrect references do not allow the citation services to correctly index citations. Last, in the online version of the journals, the

TABLE 1. Hanscom Research Site cirrus cloud field experiment measurements in 2005. All times are UTC.

Date	Raob launch time	R/L obs period	GOES image time	Cause of Ci
17 Feb	1526	1500–1800	1545	Front
24 Feb	1656	1200–1900	1645	Jet stream
22 Apr	1453	1410–1800	1515	Front
06 May	1145	1100–1400	1145	Front
20 May	1156	1100–1500	1215	Front
20 May	1353	1100–1500	1415	Front
03 Jun	1346	1200–1600	1415	Front
21 Jun	1505	1400–1710	1515	Jet stream
24 Jun	1401	1250–1620	1415	Jet stream
21 Jul	1656	1600–1900	1715	Convection
26 Jul	1602	1505–1805	1615	Front
29 Jul	1331	1240–1830	1345	Front
29 Jul	1644	1240–1830	1715	Front
08 Aug	1245	1155–1500	1315	Front
16 Aug	1556	1507–1812	1615	Jet stream
18 Aug	1146	1100–1400	1215	Front
19 Aug	1420	1125–1525	1445	Front
26 Aug	1416	1320–1620	1445	Front
09 Sep	1149	1055–1237	Missing	Front
30 Sep	1135	1040–1515	1145	Jet stream
19 Oct	1232	1140–1445	1245	Jet stream
20 Oct	1339	1255–1600	1345	Jet stream
21 Oct	1730	1410–1930	1740	Front
31 Oct	1229	1145–1500	1245	Jet stream
01 Nov	1914	1655–2030	1945	Front
09 Nov	1300	1135–1500	1315	Front
05 Dec	1611	1515–1820	1615	Jet stream
22 Dec	1514	1420–1720	Missing	Jet stream

conditions, but allow for testing the capability of retrieval techniques in their seasonal variation.

4. Results

a. Cirrus property retrievals

Location and prevalence of cirrus are first-order characteristics in regards to their effect on laser transmission. Cirrus-top height accuracy is crucial in the assignment of laser source altitude so that a laser path may avoid ice crystal layers. Figure 1 shows a comparison of the cirrus-top altitudes as retrieved from the satellite imagery, the radiosonde relative humidity, and as measured by the radar and lidar. Also shown is the tropopause altitude as determined from the raob using the algorithm of Roe and Jasperson (1980). The *GOES-12* CDPR algorithm has a tendency to understate the CTA. The empirical CP = f(RH) algorithm applied to the raobs, especially when limited by the tropopause height, achieves a better match in CTA with the radar–lidar measurements. The raob-diagnosed CTA also more closely follows the case-to-case variation of the radar–lidar values. Raobs diagnosed the presence of cirrus overhead in all cases while the satellite-based cloud detection scheme failed to detect cirrus overhead in five cases.

CBA retrievals and measurements are shown in Fig. 2. There appears to be a tendency of the GOES retrievals to be too high. The raob-based CBA retrievals show even greater accuracy than the corresponding CTA values. This is seen in a comparison of statistics over all cases as shown in Table 2. Bias, mean absolute error, and standard deviation of the error statistics, when evaluated against radar–lidar values as reference, are shown for the GOES and raob retrievals for just the cases detected by the satellite and for the raob retrievals for all cases. For the raob estimate, CTA mean absolute error is about 1.6 times that of CBA, and would be an even greater error if CTA was not tropopause constrained. Because of uncertainties in time selected to evaluate the radar–lidar signal for CTA and CBA for these comparisons and because of range gate resolution, the specification error of radar–lidar CTA and CBA is estimated to be ±200 m. Clearly the CBA estimate from the raob retrieval is competitive with this error of estimate and suggests the absence of any systematic error.

The statistics for retrieved cirrus thickness indicate that the raob estimates result in layers diagnosed too thin by an average of 0.4–0.5 km, compared to GOES negative thickness bias of 1.8 km. Clearly the in situ sensor of the radiosonde, while not measuring cloud properties directly, has an advantage over the remotely sensed vertical cloud boundaries by the satellite sensors. This is especially true of the cloud base that is undetected by the satellite.

Laser transmission calculations require IWC and the D_{eff}. While the retrieval algorithm of Donovan and van Lammeren (2001) applied to the radar and lidar measurements can produce their profiles, the CDPR algorithm of Gustafson and d'Entremont (2000) applied to *GOES-12* imagery provides only bulk values for each pixel. The CDPR algorithm retrieves ice water path (IWP), D_{eff}, CTA, and CBA. Cirrus-layer-mean IWC is computed from IWP/(CTA − CBA). The radar–lidar cirrus retrieval algorithm can only produce IWC and r_{eff} values for portions of the cirrus layer detected by both the radar and lidar. For this purpose, the highest base and lowest top detected by the radar–lidar tandem act as the CBA and CTA defining the vertical domain of the retrieved IWC and r_{eff} values. This underestimates the full thickness of the cirrus layer in comparison to using the highest top and lowest base as depicted in Figs. 1 and 2.

Retrieved particle size comparisons require a recon-

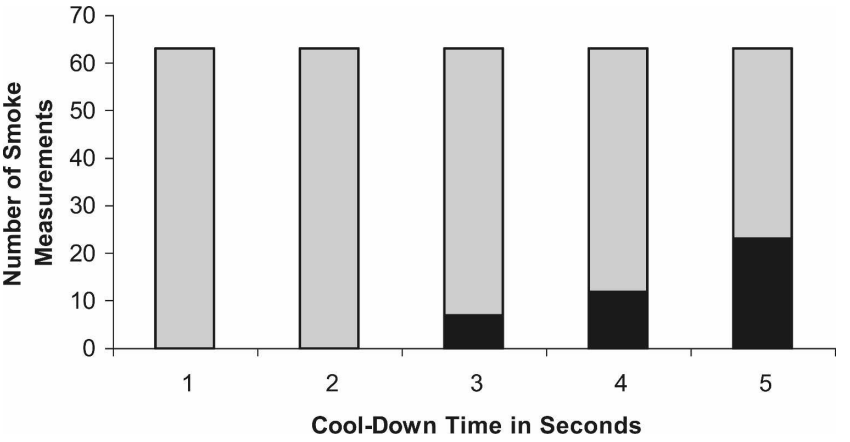

FIG. 4. Application of the longwave radiation model to the 63 smoke measurements showing the number of cooldown temperatures that reached saturation (dark portion).

largest LWC being 4.37 g m^{-3}. Mixing after 5 s of cooling produced 19 supersaturations the largest being 5.07 g m^{-3}.

What would have been the results if the ambient air had been near saturation? The calculations were redone with ambient relative humidity set to 95%. Mixing after 5 s of cooling would have produced 27 supersaturations with the largest being 5.74 g m^{-3} (last row of Table 2). These LWCs are listed for each smoke in columns 8 and 9 of Table 1 and also in the first two columns of Table 3.

5. Discussion

Liquid water contents for natural fog typically range between 0.001 and 0.30 g m^{-3} (Cotton and Athens 1989; Kunkel 1984; Teixeira 1999; Roach 1976; Hudson 1980; Meyer et al. 1980; Fuzzi et al. 1992; Duynkerke 1991; Guedalia and Bergot 1994). The LWC modeled from the smoke temperature and moisture measurements in the smoke study ranged from 0.07 to 5.1 g m^{-3}—up to 17 times as large as LWC found in fogs forming under natural conditions.

What are the implications of these high LWC for visibility? Clearly fogs formed from smokes measuring 0.1 m in diameter are localized. However, the combined moisture from numerous smokes spread over a burn area of several hundred hectares (Achtemeier 2006) may widen a fog plume and lengthen its range.

The relationship between visibility (VIS) and fog density is (Kunkel 1984)

$$\mathrm{VIS} = -\frac{\ln(\eta)}{\beta}, \tag{5}$$

where β is the extinction coefficient given by

$$\beta = \pi \sum_{i=1}^{N} Q_e n_i r_i. \tag{6}$$

Here η is the threshold of contrast (normally equal to 0.02), Q_e is the normalized extinction cross section, and n_i is the number density for droplets of radius r_i. If the droplet size distribution is not known, then an empirical

TABLE 2. Results of the mixing model simulations. The columns give the number (No.) of smoke/ambient mixes per cooldown time step (Sec) and liquid water content category for which supersaturation occurs.

LWC	>0.01	>0.05	>0.10	>0.25	>0.50	>1.00	>2.00	>5.00	g kg^{-1}
Sec	No.	No.	No.	No.	No.	No.	No.	No.	Max
1	0	0	0	0	0	0	0	0	0.00
2	3	3	3	3	3	0	0	0	0.80
3	5	5	5	5	5	3	1	0	3.09
4	12	12	12	10	8	6	3	0	4.37
5	19	19	18	16	14	10	6	1	5.07
5*	27	27	25	24	23	15	10	2	5.74

* Assumes 95% ambient relative humidity.

TABLE 3. Mean intensity and size estimates of NT = 0, NT = 1, and NT > 8 hurricanes.

Class	NL[a]	MaxWind[b]	ROCI[c]	Area[d]
NT = 0	24	21.9	1.4	8.28
NT = 1	7	28.7	1.8	12.77
NT > 8	19	47.1	2.9	32.53

[a] NL is No. of separate landfalls.

[b] MaxWind is mean intensity at landfall (m s^{-1}).

[c] ROCI is mean radius of outer closed isobar (at surface, in degrees of latitude).

[d] Area is mean area within ROCI (in degrees of latitude squared)

information contained in the references can often be automatically parsed to create embedded links to the abstract and full text of the article being cited. This can only be done if the reference information is complete and correct.

b. Citations in text

Citations to standard references in text should consist of the name of the author and the year of publication—for example, Smith (1990) or (Smith 1990). If there are three or more authors, state the first author's surname, followed by "et al." and the year of publication—for example, Smith et al. (1990) or (Smith et al. 1990). When there are two or more papers by the same author or authors in the same year, distinguishing letters (a, b, c, etc.) should be added to the year in both the citation in text and the reference listing—for example, Smith (1990a). For multiple citations by one author, separate years by commas—for example, Smith (1989, 1990) or (Smith 1989, 1990). Separate by semicolons multiple citations by different authors that appear within the same parentheses—for example, (Smith 1990; Jones 1991) or (Smith 1989, 1990; Jones 1991).

When a citation in text needs to refer to a specific section or chapter, this should be included after the year, preceded by a comma—for example, Smith (1996, chapter 7), Smith (1997, section 3.22), or (Smith 1977, section 3.22). Do not include the chapter in the citation if that chapter is explicitly identified in the reference itself (as in the case of a chapter of a multiply authored monograph). If a specific page or page range needs to be cited, this should also follow the year, preceded by a comma—for example, Smith (1996, 235–237). If a single page is cited, insert a "p." before the number—for example, Smith (1996, p. 125).

Nonstandard references should be used only if they are essential to support the author's arguments or to give proper credits. When required, the same form of text citation is used. References to personal communications should appear only in the text and should include initials and year—for example, D. E. Smith (1982, personal communication) or (D. E. Smith 1982, personal communication). It is sometimes necessary to make reference to information that is located on the Internet. Internet files do not, however, have the permanence of traditional publications and are therefore generally considered nonstandard references. Reference to files, information servers, or Internet sites should be made parenthetically and should contain the complete Uniform Resource Locator (URL) for the document or server.

Manuscripts that have been submitted to a journal but not yet accepted for publication cannot be included in the reference listing and must be cited in text in a manner similar to personal communication—for example, Smith (1998, manuscript submitted to *Mon. Wea. Rev.*). Manuscripts that have been accepted and are currently in the process of being published can be cited as regular references and should be listed in the reference section with "in press" replacing the normal page range information. In both the case of submitted manuscripts and articles in press, authors will be asked to provide an update on the status of the reference with their page proofs. Submitted manuscripts that have been accepted by that time will be converted to "in press" references, while those that had been in press can often have their complete publication information included. Note that “conditional acceptance” from an editor does not qualify for a manuscript being listed as "in press." A manuscript is truly “in press” only when it has been accepted in final form and forwarded from the editor to the publisher for processing (such as when an editor forwards an AMS journal manuscript to AMS Headquarters).

c. Reference format

The AMS reference style for typical journal citations follows the general form

Author(s), publication year: Article title. *Journal name*, **volume**, page range.

and for a book it follows the form

Author(s), publication year: *Book Title*. Publisher, total pages.

There are, however, many variations on these basic formats to account for the many types of publications that can be referenced. A complete guide to reference formats is provided in the *AMS Guidelines for Preparing References*. Authors are requested to follow this format to the best of their ability to reduce the level of markup required and to expedite the processing of manuscripts.

Journal titles in references are abbreviated following standard abbreviations. Appendix C provides a list of commonly cited journals and the form of abbreviation for their title that should be used in the reference. A more complete listing of journal abbreviations is available in the *Chemical Abstract Service Source Index 1907–1994 Cumulative* (1994), which serves as the standard reference for AMS publications for any journal not listed in appendix C. Standard abbreviations for other terms that frequently occur in references are given in Table 4.

Non-English-language article titles in the reference list must be followed by the translated title in parentheses. Alternatively, only the translated title can be given, but this must be followed by a statement in parentheses giving the language in which the article was published—for example, "(in Russian)." Foreign language journal names in Russian must be given in transliterated form.

Section letters, where appropriate, are to be included with the volume—for example, *Philos. Trans. Roy. Soc. London*, **A200**. Issue numbers should be included only if omitting them would lead to a possible ambiguity.

References should be ordered alphabetically by the last name of the first author. When there is more than one reference by the *same* first author, use the following sequence to order them: all singly authored papers first, arranged chronologically by year of publication; followed by papers authored by that first author with only one coauthor, chronologically by year; followed by papers authored by that first author with two or more coauthors, chronologically by year. Do not use a 2-em line to denote repeat authors—they will be added at typesetting stage by our press.

For references with more than eight authors, list only the first author by name followed by "and Coauthors" (e.g., "Smith, J., and Coauthors, 1998: Title of article ..."). Note that it has been confirmed with the Institute for Scientific Information that all coauthors on a paper listed in this manner in an AMS journal receive proper citation credit for the reference.

13. Submitting manuscripts to AMS

When an author has decided which journal is most appropriate for the publication of his or her manuscript (see Part I, section 3), the following materials should be submitted

Table 4. Standard abbreviations for use in references

Term	Abbreviation
Chapter	chap.
Conference	Conf.
Edition	ed.
Editor	Ed.
International	Int.
Memorandum	Memo.
pages	pp.
Proceedings	Proc.
Supplement	Suppl.
Symposium	Symp.
Technical Report	Tech. Rep.
Volume	Vol.

electronically (see section 14). The material will be checked to see if the requirements described in Fig. 2 are met, and qualifying manuscripts will be forwarded to the relevant chief editor to begin the peer-review process. Qualifying for all journals is done at AMS Headquarters. Thus, authors who cannot submit electronically must send hard copies of the material directly to AMS Headquarters. Queries can be addressed to the chief editors listed on the inside covers of the journals or on the AMS Web pages.

- *Cover letter*. Because most of the information related to a paper is now submitted through filling in fields in the upload system, a cover letter is no longer required unless requesting an exemption from the 7500-word length requirement. If submitted, a cover letter should include the title of the manuscript; authors' names; name, address, *e-mail address*, and telephone and fax numbers of one author (usually the lead author) to whom future correspondence should be addressed; and the section of the journal (Articles, Notes and Correspondence, etc.) for which the author considers the manuscript most suitable. Authors should inform the editor in the cover letter if the material in a paper has been submitted elsewhere. This notification should also be made if *substantial* parts of the results presented are being submitted elsewhere or are under consideration for publication elsewhere. If the author proposes to exceed the length limit, the cover letter should request an exemption and provide justification for same.

- *Manuscript and figures*. If not submitting electronically, for all AMS journals except *JPO*, five copies of the complete text of the manuscript (including figure captions, tables, and references), plus five sets of photocopies of the figures, should be submitted. For *JPO*, send three copies rather than five. Because figures are often changed in response to reviewers' comments, the author may choose to retain the originals of his or her figures and submit them later with the revised manuscript. The cover letter should state this intention.

- *Copyright form*. Transfer original AMS copyright transfer forms signed in ink by all authors (see Part I, section 5g). Scanned or facsimile versions are now also acceptable, although original signatures are preferred.

14. Submitting manuscripts in electronic form

To expedite the review process, authors now are expected submit their manuscript and related material to AMS in electronic form to allow electronic transmittal by AMS to the chief editor for peer review. In addition, the authors' keystrokes will be available for use in the production and printing process, leading to faster processing and fewer errors. If a manuscript can only be supplied in hard copy form, please see section 13 for general guidelines and contact the AMS for instructions on how to proceed.

a. Overview

The AMS now uses a Web-based electronic upload system, designed to speed up peer review and give access to the authors' original files earlier in the production process so as to streamline production and improve version control. In it, AMS uses the authors' uploaded raw double-spaced word-processing files to create a PDF file for peer review. {Currently, authors using typesetting languages such as LaTeX or other file types that are not handled by the PDF converter are asked to upload their own PDF file, as before, along with the raw manuscript files.

At production time, a TeX-to-Word converter is used to convert raw LaTeX files that have been created using the AMS-supplied LaTeX template for use in the production stream. All other LaTeX or TeX raw files are manually keypunched from the PDF file.} The double-spaced tables along with the figures for peer review (with single-spaced captions) can be uploaded as part of the word-processing file, as separate word-processing files, or as PDF files. The PDF converter will concatenate them if necessary and incorporate them into the peer-review PDF file. Original (print-quality, preferably captionless, EPS or TIFF) electronic figure files can also be uploaded at this time or later in the review process. If hard-copy figures are provided, they can be mailed to AMS at the revision stage or upon acceptance. Cover letters and scanned copies of copyright forms also can be uploaded at the same time as the raw manuscript files, for transmittal to the field editors (original copyright forms should be mailed immediately thereafter if provided). If a manuscript under review requires revisions, then the uploading/PDF creation process will be repeated, with the software handling the version control of the files.

There is no file-size limit, but authors are encouraged to make their peer-review figures of reasonable size (total under 10 MB) if possible to facilitate file transfer. Uploaded original figures often will be bigger than the size limit, but they can be compressed using WinZip or other compression software.

b. Procedure

Authors should submit their manuscripts electronically through the AMS Web site (www.ametsoc.org) by choosing this option from the "Authors' Resource Center (ARC)" found in the publications section or by clicking on the “Submit a manuscript to a journal” link on the left side of the AMS home page. Detailed directions for how to complete the upload are contained on the Web pages as instructions and links.

Authors requesting page waivers should submit an electronic cover letter (see section 13) with their electronic file submission. If the cover letter and/or scanned copyright forms are not submitted electronically, then immediately after the electronic submission has taken place, authors should fax their cover letters (which should indicate that the manuscript has been submitted electronically) and/or the signed copyright transfer form to AMS Headquarters at 617-973-0468, to the attention of “Journal Submissions (*Journal Name*).” Hard copies of the copyright transfer form(s) with original signature(s), if provided, should immediately thereafter be mailed to

Journal Submissions (*Journal Name*)
American Meteorological Society
45 Beacon Street
Boston, MA 02108-3693

It is in the best interest of the author that the editor overseeing the peer review of the manuscript be in a position to use the most appropriate scientific experts as reviewers. In rare cases, a reviewer may prefer a hard copy manuscript or may not be in a position to access the manuscript electronically. If the electronically submitted manuscript has no color figures, the editor's office can simply print a copy to send to the reviewer. If color figures are included, however, this may not be possible. Therefore, for manuscripts that include color figures, the author may be asked to forward to the editor’s office hard copy manuscripts with color figures

for distribution to reviewers.

c. Supplemental electronic files

As discussed in Part 3, section 3 of this *Authors' Guide*, the AMS journals provide the opportunity for authors to include supplemental electronic files with their articles. Manuscripts with supplemental electronic files must be submitted using the online submission procedure outlined in this section. The electronic supplements should be submitted with the manuscript as auxiliary files.

d. Providing the final accepted manuscript for processing

After acceptance of the manuscript by the editor, a copy of it is needed at AMS Headquarters. Under the upload system, AMS will already possess the electronic version and the PDF version. If not already uploaded, electronic figure files will be requested by AMS. The final version of the manuscript must adhere to all requirements set forth in other sections of this *Authors' Guide*. In particular, a list of figure captions must be added if not already present (see Fig. 2). Final acceptance will be withheld by the field editor until these requirements are met. It is not acceptable for authors to provide an updated manuscript after acceptance, and in fact the upload system will prevent them from producing a new PDF. Versions uploaded as auxiliary files will be ignored. The version used to create the final PDF for peer review will be used in production. If an author needs to correct typographical errors, update references, make alterations stemming from conversion of figures from color to black and white, and so on, the changes must be provided as a list in a separate e-mail or uploaded Word document and AMS Headquarters must be notified. At their discretion, the technical and copy editors will incorporate the changes. Any changes not made during initial typesetting can be again requested after review of the page proofs. Extensive changes to the scientific content or conclusions will be forwarded to the appropriate field editor for evaluation and possible additional peer review, resulting in delays in publication.

A discussion of the current status of using the electronic form of the author's manuscript is provided in the next section.

15. Use of the author's electronic manuscript

The AMS uses electronic files of accepted manuscripts in the production process for editing and typesetting purposes. Our press takes the author-provided electronic file and runs it through a tooling process to produce a Microsoft Word file that has, to the extent possible using automatic routines, been converted to AMS format, has had the references cleaned up, and has been prepared for copy and technical editing, which is done electronically at the AMS. The first steps necessary for creating an SGML version are also introduced into the file during this process. The efficiencies realized from using author-provided files and streamlining the production process can under optimum conditions result in production times of under four months from acceptance to mailing and posting. Those authors using Word should see section 6 for some guidelines on the use of MathType within their documents to expedite processing.

The author files are requested through a Web-based uploading system in which the files are obtained upon submission of a manuscript for peer review and are updated as necessary during the revision process. LaTeX files created using the AMS-provided template automatically

converted to Word by our press, preserving the author keystrokes. All other LaTeX files are manually keypunched to convert them to the Word format required for processing. For peer review, LaTeX authors provide PDF files of their manuscript in addition to the raw files; files submitted in Word are automatically converted to PDF by the AMS for peer review.

The AMS journals are produced by typesetting directly into Standard Generalized Markup Language (SGML). SGML is an international standard (ISO 8879) means of coding information that creates device- and platform-independent electronic files that can be efficiently used to generate all forms of the publication—print, online, CD-ROM, etc. Many publishers are moving toward the use of SGML for their publications, and the AMS has been a leader among scientific societies in taking full advantage of SGML in the production of its journals. The versatile search and display options available with the AMS Journals Online are a direct outcome of the use of SGML in their production. In fact, without the SGML approach being used for the AMS journals, it is not clear the Society could afford to deliver the journals online at all. The workflow now used by the AMS allows the SGML codes to be introduced efficiently into the Word files being used for the electronic editing process.

Part III. Including Electronic Files that Supplement Article Content

1. Introduction

As scientists use more and more sophisticated visualization techniques in their research, it can become ever more difficult to portray on the static printed page the dynamic, interactive display of results that is sometimes critical to complete understanding. It is therefore becoming more desirable for there to be a mechanism that allows authors to deliver electronic files to readers in support of their article content. This is straightforward for an all-electronic journal such as *Earth Interactions* and was a major reason why this new journal was implemented without a print component. For researchers outside of the earth systems science community served by *Earth Interactions*, however, who publish in the other AMS journals, there is no mechanism for providing electronic files as an integral part of their peer-reviewed articles.

It is now possible to provide electronic files to readers of the AMS journals in the form of supplements to the articles themselves. Such supplemental material is not considered part of the official journal archive, but every attempt is being made to provide it in a way that will be accessible to the community for many years.

2. CD-ROM supplements to AMS journals

A CD-ROM containing supplemental electronic files that support articles in an issue can be produced and mailed with the issue (enclosed in the issue's polybag) to all subscribers. The files included on the CD-ROM can include datasets, computer code, or various forms of visualizations of the work discussed in some of the articles in that issue. The files on the disc are accessed through an HTML "readme" file on the root directory of the CD-ROM. Users can open the "readme" file in their preferred Web browser as a local file and follow hypertext links to other files on the CD-ROM (or, in some cases, also to additional material available on the Web). The content on all CD-ROM supplements is also available on the AMS Web site so that readers of the journals online also have easy access to the supplemental material.

The first two CD-ROM supplements produced by the AMS accompanied the June 1998 *Journal of Climate* and the June 1998 *Weather and Forecasting* issues. Both were in support of special issues of those journals. The procedures followed by authors and editors are outlined in the next section.

a. Creating a CD-ROM supplement for a journal issue

The chief editor or a designated overseeing editor is responsible for securing interested authors and organizing the issue that will have a supplemental CD-ROM. This might involve informing all authors currently in some phase of the review process of a special issue that a CD-ROM supplement might be appropriate and asking those who would like to take advantage of it to submit a proposal for inclusion. While single-subject special issues are natural candidates for a supplemental CD-ROM, an editor can also work toward securing several authors interested in providing supplemental electronic files on unrelated topics and creating a regular issue that has a supplemental CD-ROM supporting some or all of the articles in that issue. Authors who have supplemental materials and want to participate in the initiative will have to have their papers ready for inclusion in that issue (or in some cases may have their paper delayed to be part of it).

A CD-ROM supplement will only be produced if there are enough authors or enough content to make it financially viable (see next section).

b. Author charges for CD-ROM supplements

Since the CD-ROM is mailed with all issues and no additional funds are received from subscribers for them, the CD-ROM must be supported entirely through author charges. The cost of producing CD-ROMs has dropped significantly over the past few years, however, so that it is possible to create a CD-ROM supplement at a low enough cost that the charges per author are comparable to including a few color figures in their article. Author charges consist of a base fee of $1300 per article, plus a charge of $10 per megabyte (prorated) for data storage beyond a base level of 50 MB. That is, an author will be charged the $1300 for the first 50 MB of supplemental material on the CD-ROM (regardless of the number of files or file types) and then $10 per megabyte for additional material. The supplement will not be produced unless there are at least four participants or sufficient additional data to provide sufficient revenue to cover costs.

3. Supplemental content on the AMS Web site

In many situations the threshold for producing a supplemental CD-ROM cannot be met, and so the AMS Publications Commission has approved the posting of electronic supplements for individual articles. This allows authors to provide supplemental electronic files that support their articles without needing to be part of a group of articles tied to a particular issue since there is no need for a "critical mass." The material can be uploaded as auxiliary files at the time that an article or its revision is submitted through the AMS online upload system. The field editor must be notified of its existence through a cover letter.

The submission of an electronic supplement is currently restricted to authors who take advantage of the online submission of their entire manuscript as outlined in Part II, section 14. Guidelines for the content that can be part of the supplement are provided in the next section.

4. Guidelines for supplemental content

Authors are given the following guidelines for preparing supplemental content whether it is to be included in a supplemental CD-ROM or as a supplement to their article on the AMS Web site:

- The material must be supplemental to the article so that the article can stand alone in the printed form, but a footnote will be added to the title page of all printed papers that states that supplemental material is available and gives the URL, through a static DOI number. In addition, the material can be cited or described in the main text as appropriate.

- All files included in the supplement should be viewable through standard Web interfaces—for example, GIF or JPEG formats for images and MPEG or animated GIF formats for animation. Other file formats that are commonly supported by standard browsers (or that have easily accessible external viewers) are also acceptable.

- The supplemental material should not simply be additional text. That is, the

supplement should not be used for long appendixes or descriptions that can be provided through some other form of print reference.

- To the extent possible, the authors should create an HTML page that describes and links their supplement content into a coherent presentation that supports the article in the issue.

All supplements will be reviewed, but the extent of that review is at the overseeing editor's discretion. The editor is responsible for ensuring that the material included meets a standard of quality and appropriate scientific value to the community.

APPENDIX A

Accepted Forms of Common Meteorological Terms

a. Word list

Dictionaries, glossaries, and thesauruses often take time to catch up with common usage, especially in technical areas. Editors must frequently decide on the best forms of new usages for the purpose of standardizing house style. AMS editors have determined that the spellings and usages shown in Table A1 will be standard for the Society's publications. This list is updated periodically to reflect acceptance of new word usage by the scientific community. A much more comprehensive guide to meteorological terminology is the *Glossary of Meteorology* (Glickman 2000).

Table A1 contains terms commonly appearing in manuscripts. For terms not appearing on this list, the AMS uses the preferred spelling given in *Merriam Webster's Collegiate Dictionary*, 10th ed. (Mish and Morse, 1993). Unless expressly covered in the word list and additional information provided here, hyphenation of multiple-term modifiers follows the rules stated in the *Chicago Manual of Style*, 15th ed. (Mahan 2003). Many of the terms listed here are not exceptions to these two references but are included to allow quick reference by authors.

b. Proper names for ships, satellites, etc.

All ship names (such as *GLOMAR Challenger)* are italicized, but the type of ship (R/V, etc.) is not italicized. The name of an aircraft type (such as Lockheed Loadstar) is not italicized, but a proper name given to an aircraft is (as in the *Enola Gay*). The name used to denote a series of satellites or spacecraft (such as Apollo or Nimbus) is not italicized, but the name of a particular vehicle is (such as *Apollo 11* or *Nimbus-3*).

c. Common prefixes and suffixes

Table A2 provides the rules governing some common prefixes and suffixes along with examples of usage. Exceptions to these rules for specific words are noted in the AMS word list provided as Table A1.

TABLE A1. AMS word list.

A

airborne

airflow

air mass (n), airmass (adj)

air parcel

airspeed

airstream

alongfront

alongshore

alongside

along-slope

along-valley

analog

Ångström (proper name), angstrom (Å, unit)

Arctic Circle

arctic flow

autocorrelation

B

backscatter

backup (n), back up (v)

bandpass

bandwidth

basic state (n), basic-state (adj)

beamwidth

benchmark

blackbody

boundary layer

Boussinesq equations

breakup (n), break up (v)

bright band (n), brightband (adj)

broad band (n), broadband (adj)

Brunt–Väisälä frequency

buildup (n), build up (v)

built-up (adj)

bull's-eye

by-product

C

centerline

clear-cut

cloud base (n), cloud-base (adj)

cloud-free (adj)

cloud top (n), cloud-top (adj)

cloud water

collocated

Coriolis force

cross-check

cross correlation (n), cross-correlation (adj)

cross-flow

cross section (n)

cross-sectional (adj)

cross-shore

cross-spectrum

crosswind

cutoff (n), cut off (v)

D

database

datalogger

data plot

data point

dataset

date line

deep water (n), deep-water (adj)

degree-day

dewpoint

disdrometer, distrometer

Doppler radar

downgrade

downgradient

downslope

dry-adiabatic (adj)

dry-bulb (adj)

dryline

E

e-folding

El Chichón

El Niño

eigenfunction

eigenvalue

eigenvector

enstrophy

Eos (AGU publication)

Eta Model (NCEP model)

eta model (generic model in eta coordinates)

evapotranspiration

extratropical

eyewall

F

f plane (n), *f*-plane (adj)

falloff (n), fall off (v)

fall speed

far-field (adj)

fine-grid (adj)

fine structure

finescale

fine-tune

finite difference (n) finite-difference (adj)

fixed point (n), fixed-point (adj)

flowmeter

form drag

free-fall

freshwater

G

Gaussian

Geosat

gravity wave

graybody

grayscale

Grey probe

grid point (n), gridpoint (adj)

H

Hadley cell

hailstone

hailstorm

half-width

high-pass filter

high pressure system

Hovmöller *or* Hovmoeller

I

in between (adv, prep)

in-between (n, adj)

indexes (plural of index)

indices (for data)

inertia–gravity wave

inertio-gravity wave

interannual

international date line

Internet

isopycnal

isopycnic

J

Januarys

jetlike

K

kona low

L

Lagrangian coordinates

landmass

Landsat

land surface (n, adj)

La Niña

large scale (n), large-scale (adj)

leapfrog

least squares (n, adj)

lee side (n), leeside (adj)

lee wave (n), lee-wave (adj)

left-hand side, lhs

length scale

lidar

life cycle

lift-off

limited area (n), limited-area (adj)

log pressure

lognormal

long-term (adj)

long wave (n, hydrodynamic),

long-wave (adj, hydrodynamic)

longwave (radiation)

lookup table

loran

Loran C

low-pass filter

low pressure system

M

Macintosh

Madden–Julian oscillation

makeup (n), make up (v)

Maritime Continent

mei-yu

meltwater

Meso Eta Model (NCEP model)

Meteosat

middle atmosphere

-moment (statistics)

Monte Carlo

mountain-wave system

N

narrow band (n), narrowband (adj)

NCEP–NCAR 40-Year (50-Year) Reanalysis

near-bottom (adj)

near-field (adj)

near-infrared (adj)

near–real time (n), near-real-time (adj)

nearshore (adj)

near-stream (adj)

near-surface (adj)

nighttime

Nimbus

Niño-3

North Atlantic Current

north-central

North Equatorial Current

Northern Hemisphere

*n*th order (n), *n*th-order (adj)

O

offline (computer or instrument application)

offshore

omnidirectional

onboard (adj), on board (adv)

one-half

online (computer or instrument application)

onshore

P

Pacific decadal oscillation

pathlength

photochemical

planetary wave (adj), planetary waves

plane wave (n, adj)

Plexiglas

polynya

power law (n), power-law (adj)

pressure jump

primitive equation

Q

quasi-biennial oscillation

quasigeostrophic

R

rainband

rainfall

rain gauge (n, adj)

rain rate (n), rain-rate (adj)

rainwater

raob

Rayleigh's law

real time (n), real-time (adj)

remote sensing

right-hand side, rhs

rigid lid (n), rigid-lid (adj)

root-mean-square, rms or RMS

root-mean-square error, rmse or RMSE

runoff (n), run off (v)

run-up (adj), run up (v)

S

saltwater

scatterplot

sea breeze (n), sea-breeze (adj)

sea ice (adj)

sea level (n, adj)

sea level pressure

Seasat

sea surface temperature

seawater

setdown (n), set down (v)

setup (n), set up (v)

shelf break (n), shelfbreak (adj)

ship track

shoreline

short wave (n, hydrodynamic)

short-wave (adj, hydrodynamic)

shortwave (radiation)

sidelobe

skew T–log$p$

snowband

snowfall

snow line

snowmelt

snowpack

so-called

SOFAR

Southern Ocean

Southern Oscillation

Southern Oscillation index

South Pacific

South Pole

spatiotemporal

Special Sensor Microwave Imager (but SSM/I)

spinup (n), spin up (v)

squall line (n), squall-line (adj)

square root

state of the art (n), state-of-the-art (adj)

steady state (n), steady-state (adj)

step function

storm track (n), storm-track (adj)

streamflow

streamfunction

streamline

Student's *t* test

subtropical

sun glint (n), sun-glint (adj)

superadiabatic

synoptic scale (n), synoptic-scale (adj)

T

t test (n), *t*-test (adj)

test bed

three-dimensional

tide gauge

time scale (n), time-scale (adj)

time step

TIROS-N

TOPEX/Poseidon

total totals index

trade winds (n, adj)

trade-off

Tropic of Cancer

Tropic of Capricorn

Tropic Circle

tropics

twofold

U

U.S. Standard Atmosphere, 1976 (but standard atmosphere, when used generically)

underway (adj), under way (adv)

UNIX

V

Brunt–Väisälä frequency

von Kármán

W

wave band

wave crest

waveform

wave front (adj)

waveguide

wave train

wavelength

wavenumber

Web site

wet-adiabatic (adj)

wet-bulb (adj)

wind field

wind shear

wind shift (adj)

wind speed

wind stress

windstorm

World Ocean

X

x axis (n), *x*-axis (adj)

Y

yearday

Z

zero crossing

zero order

TABLE A2. Common prefixes and suffixes with examples of usage.

anti	close up with no hyphen [anticyclonic]
bi	close up [biweekly, bispectral, bilinear]
co	close up [covariance] in most cases but see dictionary to confirm
cross	compounds with cross can be closed, open, or hyphenated; see dictionary [crosscurrent, cross-purpose, cross section]
counter	close up [countercurrent]
high-	hyphenate when used as part of a compound adjective [high-density fluid, high-latitude stress]
-layer	hyphenate when used as part of a compound adjective [cloud-layer winds, inversion-layer thickness]
-level	hyphenate when used as part of a compound adjective [low-level winds, freezing-level temperature]
low-	hyphenate when used as part of a compound adjective [low-level winds, low-frequency oscillation]
meso	close up [mesoscale, mesometeorology]
mid	close up [midday, midlatitude, midlevel (note that this supercedes -level rule)]
middle-	hyphenate when used as part of a compound adjective [middle-ocean current] but normally use "mid" and close up [midlatitude rather than middle-latitude]
multi	close up [multigrid, multilevel (note that this supercedes the -level rule)]
non	close up [nonlinear, nonzero]
over	close up [overrun, overestimate]
post	close up [postfrontal]
pre	close up [prefrontal, preestablish]
pseudo	close up [pseudoadiabatic]
quasi-	hyphenate when used in a modifier construction [quasi-periodic time series] but leave as separate word in noun structure [the cloud mass formed a quasi cluster]
re	close up [redevelop, reexamination]
self-	hyphenate [self-regulating]
semi	close up [semiannual, semigeostrophic, but semi-implicit]
upper-	hyphenate when used in a modifier construction [upper-tropospheric temperature, upper-level wind]

APPENDIX B

Standard Abbreviations

Scientific literature traditionally contains a large number of abbreviations, and many of these are used so commonly that they require no explanation in the text. Table B1 gives a list of standard abbreviations that can be used in AMS publications without definition. All other abbreviations should be defined when first introduced, as described in Part II, section 7 of this guide. The abbreviation should then be used after that without further explanation.

Table B2 gives the preferred forms of abbreviations for terms that may be used in subscripts, figure captions, or in table text and column headings. There is no need to supply additional definitions for these abbreviations unless there is the potential for ambiguity or confusion in the context of their use. Some, such as vs, lat, lon, and expt, may also be appropriate for use in parentheses in the running text. Table B3 gives some proper acronyms that do not need to be expanded in abstracts and titles.

In general, acronyms and abbreviations used for computer terminology should be defined when first used–for example, when referring to hierarchical data format (HDF) files. There are a few abbreviations and acronyms that are so common that they need not be defined. They are CD-ROM, CPU, DOS, FTP, OS/2, RAM, ROM, TCP/IP, and UNIX.

TABLE B1. Standard abbreviations that can be used in AMS journals without definition.

above ground level	AGL	Madden–Julian oscillation	MJO
above mean sea level	MSL	meter-kilogram-second	mks
acoustic Doppler current profiler	ADCP	minute	min
alternating current	ac	molecular weight	mol wt
anno Domini	A.D.	Northern Hemisphere	NH
atmospheric boundary layer	ABL		
atmospheric general circulation model	AGCM	numerical weather prediction	NWP
bathythermograph (expendable)	BT (XBT)	ocean GCM	OGCM
before present	BP	ordinary differential equation	ODE
centimeter-gram-second	cgs	partial differential equation	PDE
clear-air turbulence	CAT	parts per billion	ppb
conductivity–temperature–depth	CTD	parts per million	ppm
constant altitude plan position indicator	CAPPI	parts per million by volume	ppmv
convective available potential energy	CAPE	planetary boundary layer	PBL
convective boundary layer	CBL	practical salinity unit	psu
cosine	cos	pulse repetition frequency	PRF
cycles per day	cpd	opposite of SOFAR	RAFOS
cycles per second	Hz, cps	range–height indicator	RHI
cycles per year	cpy	real part	Re
direct current	dc	relative humidity	RH
electromotive force	emf	right-hand side	rhs
El Niño–Southern Oscillation	ENSO	root-mean-square	rms, RMS
empirical orthogonal function	EOF	root-mean-square error	rmse, RMSE
equation	Eq.	sea surface temperature	SST
error function	erf	sound fixing and ranging	SOFAR
error function (complement of)	erfc	Southern Hemisphere	SH
et alii (and others)	et al.		
et cetera	etc.	standard temperature and pressure	STP
extreme ultraviolet	EUV	three-dimensional	3D
fast Fourier transform	FFT	two-dimensional	2D
figure	Fig.	ultrahigh-frequency	UHF
frequency modulation	FM	ultraviolet	UV
general circulation model	GCM	coordinated universal time	UTC
geographical information system	GIS	with respect to	w.r.t.
global positioning system	GPS	year	yr
high frequency	HF		
imaginary part	Im		
infrared	IR		
International Geophysical Year	IGY		
intertropical convergence zone	ITCZ		
left-hand side	lhs		
level of free convection	LFC		
lifting condensation level	LCL		
liquid water content	LWC		
liquid water path	LWP		
local standard time	LST		
local time	LT		

TABLE B2. Preferred abbreviations for terms that are often used in subscripts or table column headings, figure captions, and table text. No additional definitions are required when these terms are used. Months should be represented by their three-letter abbreviations when in the form of day/month (e.g., 7 Dec) or day/month/year (e.g., 30 Jul 2000). Two-letter postal abbreviations should be used for states unless the full spelling is needed for narrative purposes.

altitude	alt	latitude	lat
approximate	approx	longitude	lon
atmosphere	atm	maximum	max
average	avg	minimum	min
calculated	calc	number	No.
coefficient	coef	observed	obs
constant	const	standard	std
deviation	dev	standard deviation	std dev
diameter	diam	theory, theoretical	theor
difference	diff	total	tot
elevation	elev	versus	vs
experiment(al)	expt	volume	vol
laboratory	lab	weight	wt

TABLE B3. The following is a list of administrative acronyms that need not be expanded when used in abstracts.

CSIRO	NCEP
ECMWF	NOAA
GFDL	NSSL
GISS	NWS
NASA	WMO
NCAR	

APPENDIX C

Standard Journal Abbreviations

TABLE C1. Selected journal abbreviations to be used for the names of journals in the references.

Title of journal	Abbreviation
A	
American Scientist	*Amer. Sci.*
Annalen der Meteorologie	*Ann. Meteor.*
Annales de Geophysique	*Ann. Geophys.*
Annales de Physique	*Ann. Phys.*
Applied Optics	*Appl. Opt.*
Archiv für Meteorologie, Geophysik und Bioklimatologie	*Arch. Meteor. Geophys. Bioklimatol.*
Atmósphera	*Atmósphera*
Atmosphere; Atmosphere—Ocean	*Atmos.—Ocean*
Atmospheric Environment	*Atmos. Environ.*
Australian Journal of Agricultural Research	*Aust. J. Agric. Res.*
Australian Meteorological Magazine	*Aust. Meteor. Mag.*
B	
Beitraege zur Physik der Atmosphaere	*Beitr. Phys. Atmos.*
Boundary-Layer Meteorology	*Bound.-Layer Meteor.*
Bulletin of the American Meteorological Society	*Bull. Amer. Meteor. Soc.*
C	

Climatic Change	*Climatic Change*
Climate Dynamics	*Climate Dyn.*
Climatological Bulletin	*Climatol. Bull.*
Communications on Pure and Applied Mathematics	*Commun. Pure Appl. Math.*
Continental Shelf Research	*Cont. Shelf Res.*
Contributions to Atmospheric Physics	*Contrib. Atmos. Phys.*

D

Deep-Sea Research	*Deep-Sea Res.*
Deutsche Hydrographische Zeitschrift	*Dtsch. Hydrogr. Z.*
Dynamics of Atmospheres and Oceans	*Dyn. Atmos. Oceans*

E

Electronic Journal of Severe Storms Meteorology	*Electron. J. Severe Storms Meteor.*
Environmental Research	*Environ. Res.*
Environmental Science and Technology	*Environ. Sci. Technol.*
Eos, Transactions, American Geophysical Union (EOS)	*Eos, Trans. Amer. Geophys. Union*
Estuarine and Coastal Marine Science	*Estuarine Coastal Mar. Sci.*

G

Geofisica Internationale	*Geofis. Int.*
Geofysiske Publikasjoner	*Geofys. Publ.*
Geologiya i Geofizika	*Geol. Geofiz.*
Geophysical and Astrophysical Fluid Dynamics	*Geophys. Astrophys. Fluid Dyn.*
Geophysical Fluid Dynamics	*Geophys. Fluid Dyn.*
Geophysical Magazine	*Geophys. Mag.*

Geophysical Research Letters	*Geophys. Res. Lett.*
Geophysics	*Geophysics*

I

IEEE Transactions on Geoscience and Remote Sensing	*IEEE Trans. Geosci. Remote Sens.*
IEEE Transactions on Antennas and Propagation	*IEEE Trans. Antennas Propag.*
Infrared Physics	*Infrared Phys.*
International Journal of Air and Water Pollution	*Int. J. Air Water Pollut.*
International Journal of Remote Sensing	*Int. J. Remote Sens.*
Izvestiya, Academy of Sciences, USSR, Atmospheric	*Izv. Acad. Sci. USSR, Atmos. Oceanic Phys.*

J

Journal of Applied Meteorology	*J. Appl. Meteor.*
Journal of Applied Meteorology and Climatology	*J. Appl. Meteor. Climatol.*
Journal of Applied Physics	*J. Appl. Phys.*
Journal of Atmospheric and Oceanic Technology	*J. Atmos. Oceanic Technol.*
Journal of Atmospheric and Terrestrial Physics	*J. Atmos. Terr. Phys.*
Journal of Climate	*J. Climate*
Journal of Climate and Applied Meteorology	*J. Climate Appl. Meteor.*
Journal of Climate Meteorology	*J. Climate Meteor.*
Journal of Climatology	*J. Climatol.*
Journal of Computational Physics	*J. Comput. Phys.*
Journal of Fluid Mechanics	*J. Fluid Mech.*
Journal of Geophysical Research	*J. Geophys. Res.*
Journal of Glaciology	*J. Glaciol.*
Journal of Hydrology	*J. Hydrol.*
Journal of Marine Research	*J. Mar. Res.*

Journal of Meteorological Research, Japan	*J. Meteor. Res. Japan*
Journal of Marine Systems	*J. Mar. Syst.*
Journal of Meteorology	*J. Meteor.*
Journal of Physical Chemistry	*J. Phys. Chem.*
Journal of Physical Oceanography	*J. Phys. Oceanogr.*
Journal de Recherches Atmospheriques	*J. Rech. Atmos.*
Journal of Scientific Instruments	*J. Sci. Instrum.*
Journal of the Aeronautical Sciences	*J. Aeronaut. Sci.*
Journal of the Atmospheric Sciences	*J. Atmos. Sci.*
Journal of the Marine Technology Society	*J. Mar. Technol. Soc.*
Journal of the Meteorological Society of Japan	*J. Meteor. Soc. Japan*
Journal of the Oceanographical Society of Japan	*J. Oceanogr. Soc. Japan*

M

Mariners Weather Log	*Mar. Wea. Log*
"Meteor" Forschungsergebnisse	*"Meteor" Forschungsergeb.*
Meteorological Magazine	*Meteor. Mag.*
Meteorological Monographs	*Meteor. Monogr.*
Meteorologische Rundschau	*Meteor. Rundsch.*
Meteorologische Zeitschrift	*Meteor. Z.*
Meteorologiya i Gidrologiya	*Meteor. Gidrol.*
Meteorology and Atmospheric Physics	*Meteor. Atmos. Phys.*
Monthly Weather Review	*Mon. Wea. Rev.*

N

National Weather Digest	*Natl. Wea. Dig.*

Nature	*Nature*
New Zealand Journal of Marine and Freshwater Research	*N. Z. J. Mar. Freshwater Res.*
Nuovo Cimento	*Nuovo Cimento*

O

Oceanography and Meteorology	*Oceanogr. Meteor.*

P

Papers in Meteorology and Geophysics	*Pap. Meteor. Geophys.*
Papers in Physical Oceanography and Meteorology	*Pap. Phys. Oceanogr. Meteor.*
Philosophical Transactions of the Royal Society of London	*Philos. Trans. Roy. Soc. London*
Physical Review	*Phys. Rev.*
Physikalische Zeitschrift	*Phys. Z.*
Proceedings of the Royal Society of London	*Proc. Roy. Soc. London*
Pure and Applied Geophysics	*Pure Appl. Geophys.*

Q

Quarterly Journal of the Royal Meteorological Society	*Quart. J. Roy. Meteor. Soc.*

R

Radio Science	*Radio Sci.*
Remote Sensing of the Environment	*Remote Sens. Environ.*
Review of Scientific Instruments	*Rev. Sci. Instrum.*
Reviews of Geophysics	*Rev. Geophys.*
Reviews of Geophysics and Space Physics	*Rev. Geophys. Space Phys.*

Revista de Geofisica	*Rev. Geofis.*
Revista Meteorologica	*Rev. Meteor.*

S

Science	*Science*
Scientific American	*Sci. Amer.*
Space Science Review	*Space Sci. Rev.*
Studies in Applied Mathematics	*Stud. Appl. Math.*

T

Tellus	*Tellus*
Theoretical and Applied Climatology	*Theor. Appl. Climatol.*
Trudy Geofizicheskogo Instituta, Akademiya Nauk SSSR	*Tr. Geofiz. Inst., Akad. Nauk SSSR*
Trudy Glavnoi Geofizicheskoi Observatorii	*Tr. Gl. Geofiz. Obs.*

W

Water Resources Research	*Water Resour. Res.*
Weather	*Weather*
Weather and Forecasting	*Wea. Forecasting*
Weatherwise	*Weatherwise*
World Meteorological Organization Bulletin	*WMO Bull.*

Z

Zeitschrift für Meteorologie	*Z. Meteor.*

REFERENCES

AIP Publication Board, 1990: *AIP Style Manual*. 4th ed. Amer. Inst. Phys., 64 pp.

Chemical Abstracts Service, 1994: *Chemical Abstract Service Source Index 1907–1994 Cumulative*. Amer. Chem. Soc., 3837 pp.

Geerts, B., 1999: Trends in atmospheric science journals: A reader's perspective. *Bull. Amer. Meteor. Soc.*, **80**, 639–651.

Glickman, T., Ed., 2000: *Glossary of Meteorology*. 2d ed. Amer. Meteor. Soc., 855 pp.

Johnson, R. H., and W. H. Schubert, 1989: Publication trends in American Meteorological Society technical journals. *Bull. Amer. Meteor. Soc.*, **70**, 476–479.

Lewis, H. A. G., and P. J. M. Geelan, 1992: *The Times Atlas of the World, Ninth Comprehensive Edition*. Times Books, 222 pp.

Mahan, M. D. F., Ed., 2003: *The Chicago Manual of Style*.15th ed. University of Chicago Press, 956 pp.

Mish, F. C., and J. M. Morse, 1993: *Merriam-Webster's Collegiate Dictionary*. 10th ed. Merriam-Webster, 1559 pp.

Seitter, K. L., and A. S. Powell Jr., 1992: AMS authors' guide. 2d ed. *Bull. Amer. Meteor. Soc.*, **73**, S1–S32.