PLANNING AND MANAGEMENT FOR WATER-RESOURCES REPORTS

THE WATER RESOURCES DIVISION of the Survey provides accurate and timely information on all aspects of water resources to the Nation's water resources planners and managers. To that end, the Division has research centers in Reston, Virginia; Denver, Colorado; Menlo Park, California; and Bay St. Louis, Mississippi; and offices in every State, Puerto Rico, and Guam. In 1985, Water Resources Division personnel at more than 200 locations collected, analyzed, and researched hydrologic data for about 1,500 reports for publication in a wide variety of formats.

This chapter provides the background information authors need to prepare water-resources reports of high quality and timeliness. Processing procedures in the Water Resources Division differ somewhat from those in the Geologic Division or in the various outside publishing organizations, but the author of any technical report planned or in progress can profit from a scan of the steps and requirements outlined below. Quality control and scheduling are rigorous.

The following introductory paragraphs briefly describe the principal organizational units of the Water Resources Division, list the kinds of reports prepared, and emphasize the importance of quality and timeliness. A section on "Planning and Managing Reports" outlines (1) the elements of planning a quality report, (2) the characteristics of a quality report, and (3) the quality-control system used by the Water Resources Division. A concluding section discusses an author's responsibility after a report has received Director's approval for publication.

PRINCIPAL ORGANIZATIONAL UNITS

Figure 1 shows the principal organizational units of the Geological Survey. In the Water Resources Division most technical reports are prepared in the District offices and Regional Research Centers. Studies in District offices are funded jointly with State and local cooperators, who pay half the cost, and with other Federal agencies or with Federal monies appropriated to the Water Resources Division. Studies and research at the Regional Research Centers or at Headquarters are funded almost entirely by Federal monies.

Funding source can profoundly affect the kind and scope of a study, the readership addressed in the report, the publication outlet, and also importantly, the pressures to publish a report by a particular date. Cooperators in jointly funded studies expect usable results (a published report) by the termination of the period funded for the study.

REPORTS PREPARED BY THE WATER RESOURCES DIVISION

The wide range of books and maps, leaflets, pamphlets, journal articles, and audio-visual products of the Water Resources Division include Water-Supply Papers, Professional Papers, Techniques of Water-Resources Investigations, Circulars, Water-Resources Investigations Reports, Open-File Reports, Water-Data Reports, Hydrologic Investigations Atlases, Miscellaneous Investigations Series Maps, cooperator-published books and maps, and general-interest leaflets and booklets, water fact sheets, and slide-cassette, video-cassette, and moving-picture-film presentations. Further descriptions of these varied reports are elsewhere in this volume, and in Alt and Iseri (1986).

Most reports prepared by District-office personnel are published or released as Water-Resources Investigations Reports, Open-File Reports, Water-Data Reports, Water-Supply Papers, or cooperator series reports. The bulk of the reports prepared by research personnel are published as journal articles, Professional Papers, or Water-Supply Papers. Thus, if you work in a district you are likely to prepare multidiscipline reports on area water resources, published as Water-Resources Investigations Reports; if employed in the research program, you are likely to author single-discipline articles for technical journals.

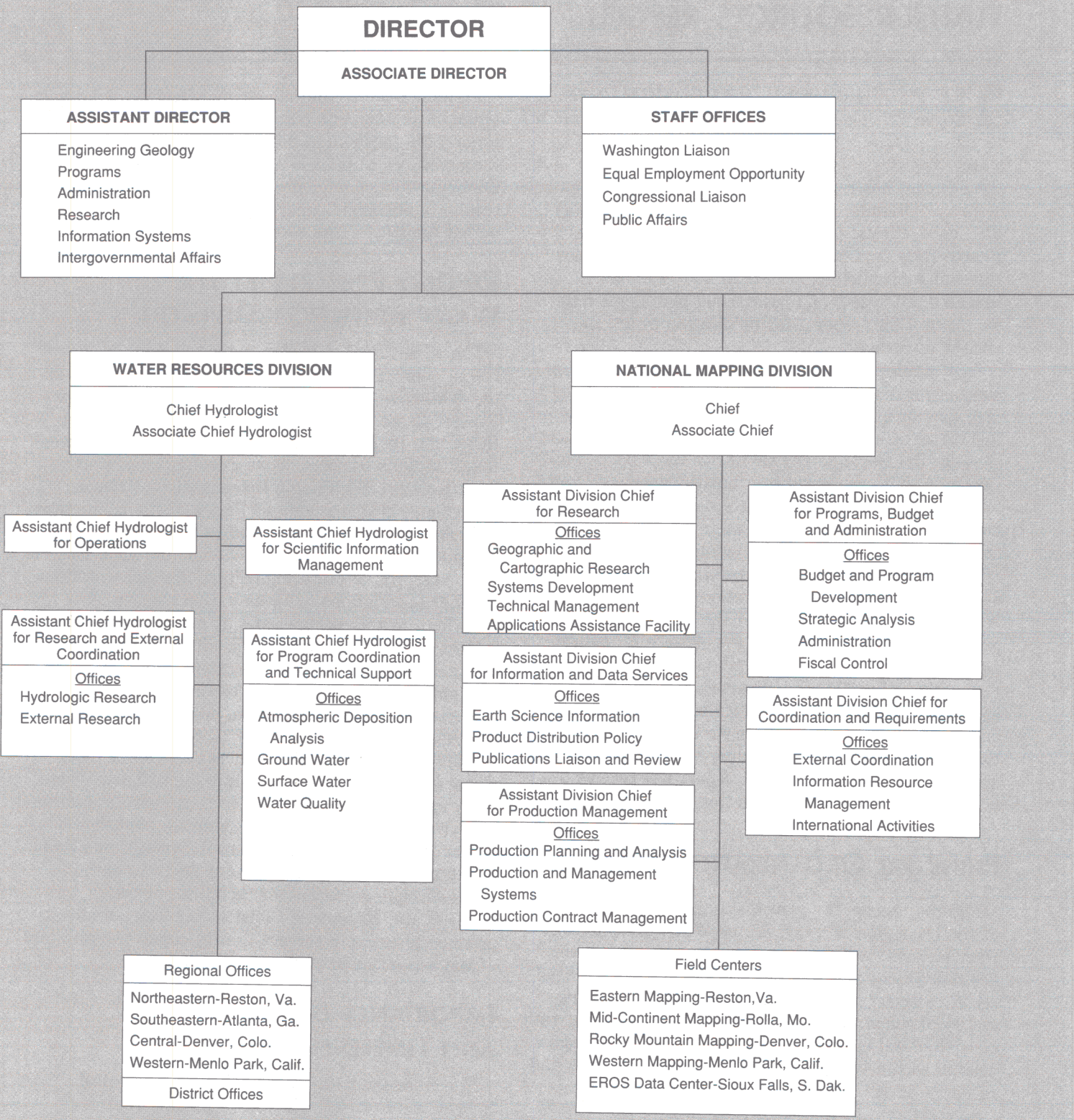
The Water Resources Division requires authors to produce technically correct, timely reports, regardless of the series, subject matter, or origin.

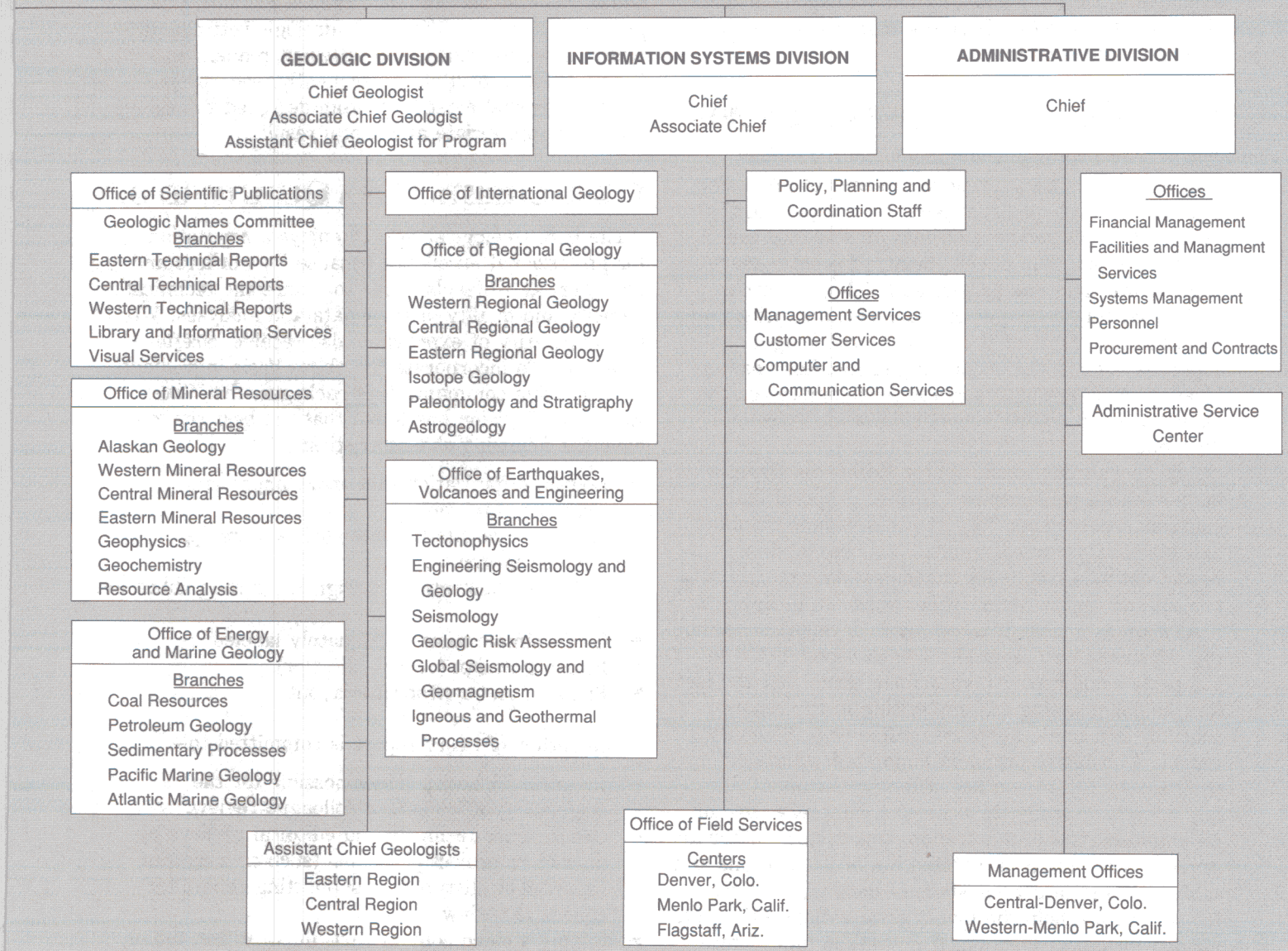
IMPORTANCE OF QUALITY AND TIMELINESS

For more than 100 years, the U.S. Geological Survey has been known worldwide as a source of reliable information on the mineral and water

ORGANIZATION OF THE U.S. GEOLOGICAL SURVEY

U. S. Department of the Interior




GEOLOGIC DIVISION
Chief Geologist
Associate Chief Geologist
Assistant Chief Geologist for Program
INFORMATION SYSTEMS DIVISION
Chief
Associate Chief
ADMINISTRATIVE DIVISION
Chief
Office of Scientific Publications
Geologic Names Committee
Branches
Eastern Technical Reports
Central Technical Reports
Western Technical Reports
Library and Information Services
Visual Services
Office of Mineral Resources
Branches
Alaskan Geology
Western Mineral Resources
Central Mineral Resources
Eastern Mineral Resources
Geophysics
Geochemistry
Resource Analysis
Office of Energy and Marine Geology
Branches
Coal Resources
Petroleum Geology
Sedimentary Processes
Pacific Marine Geology
Atlantic Marine Geology
Office of International Geology
Office of Regional Geology
Branches
Western Regional Geology
Central Regional Geology
Eastern Regional Geology
Isotope Geology
Paleontology and Stratigraphy
Astrogeology
Office of Earthquakes, Volcanoes and Engineering
Branches
Tectonophysics
Engineering Seismology and Geology
Seismology
Geologic Risk Assessment
Global Seismology and Geomagnetism
Igneous and Geothermal Processes
Assistant Chief Geologists
Eastern Region
Central Region
Western Region
Policy, Planning and Coordination Staff
Offices
Management Services
Customer Services
Computer and Communication Services
Office of Field Services
Centers
Denver, Colo.
Menlo Park, Calif.
Flagstaff, Ariz.
Offices
Financial Management
Facilities and Managment Services
Systems Management
Personnel
Procurement and Contracts
Administrative Service Center
Management Offices
Central-Denver, Colo.
Western-Menlo Park, Calif.

resources of the United States. Survey publications are basic references for academicians, other scientists, industrialists, resource planners and managers, students, litigants in court actions, and many other people.

Many cooperative studies and research investigations result from (1) needs for resource information in support of management decisions by cooperators, (2) needs for insight into hydrogeologic processes, or (3) needs to help abate environmental degradation. In any event, if a need exists when a study begins, planners and managers will make decisions within their own deadlines, regardless of the availability of potentially valuable information from the Survey. Even if a Survey report contains the only substantive information on a subject, its greatest value is lost if it is not available in time for planning and management decisions. Quality reports therefore must be produced within agreed time limits.

PLANNING AND MANAGING REPORTS

Adequate planning and management of report preparation are the only proven means of producing consistently high-quality reports on time, especially in the work environment of authors who also are involved in program development, projects management (more than one project at a time), research, data-collection-technique development, and personnel management. Most of the work in producing a quality report is done in the originating office. Regional and Headquarters evaluators can make minor repairs but cannot make a quality report from a mediocre or poor one.

Report planning in the Water Resources Division begins with a well-prepared project proposal that contains report plans. Report plans include numbers and kinds of proposed reports, their readership, report outlines, and work schedules. An example of a project-and-report review sheet is shown in figure 2.

As soon as a project is approved, a report schedule (fig. 3) should be prepared for each report listed in the project-and-report review form. Note that the last item under planning and prewriting in the report schedule is a final annotated outline or preliminary report. A properly prepared annotated outline or preliminary report is a key planning document for any project or study. It includes a comprehensive or an annotated list of illustrations and tables. Either an annotated outline or annotated list of illustrations and tables will indicate what kinds of data must be collected and will help the investigator estimate the time needed for data collection. If a study is funded for 3 years, the investigator should not plan to collect 3 years of data, because the report is scheduled for delivery at the end of the funding. A careful analysis of the funding, time, and desired elements for a report will help tailor a study and its report(s) to meet the overall scheduling and resources available. Generally, several months are required for colleague review, plus Region and Headquarters approval. Accordingly, reports should be submitted for approval several months before a project end date.

The data needs and other work elements identified by the annotated outline or preliminary report are key factors in project work plans. If followed, they will yield quality reports at the end of the funding period. Examples of annotated outlines and project work plans are shown by Moore and Chase (1985). These examples provide general guidance: Authors should understand that each project has different problems to solve, different hydrologic settings, different times for study, and different readership for the resulting report(s). Consequently, each project, and its report(s) must be custom designed to achieve the most appropriate and useful results.

CHARACTERISTICS OF A QUALITY REPORT

The U.S. Geological Survey enjoys a reputation for professional excellence because its workers and managers at all levels strive to assure the technical veracity and quality of their data and analyses. Word use and clarity of expression also receive careful attention. To incorporate the above basic ingredients into effective communication packages, the Water Resources Division has found that the best reports have the following characteristics:

- Logical organization—the more important elements stand out.
- Writing style fits the intended readership.
- Minimal jargon.
- Effective illustrations, designed for the publication format.
- Clear, simple tables, adequately labeled.
- Pleasing design (cover and color).
- Pleasing and appropriate layout.

The author of every report is committed to—

- Prepare the best product possible for the originating office before colleague review.
- Get in-house technical and editorial reviews by district or project personnel (such as a district report specialist) before submitting report for colleague review.
- Supply a clean copy of text, illustrations, tables, abstract for Water Resources Scientific Informa·

PROJECT AND REPORT REVIEW SHEET

PROJECT NUMBER: _____ DATE: _____

PROJECT TITLE: _____

PROJECT CHIEF: _____

WORK ITEMS	DEADLINE	COMPLETE	INITIALS
1. Proposal			
2. Work plans			
3. Report outline review			
4. Equipment and instruments			
5. Construction			
6. Base map			
7. Annotated outline review			
8. Data collection			
9. Data analysis			
10. Illustrations review			
11. Tables review			
12. Report completed			
13. Section chief review			
14. Report specialist review			
15. Cooperator review			
16. District chief review			
17. Colleague review			
18. District transmittal			

Comments: _____

_____

New Project Review Date: _____

Figure 2. A project and report review sheet used in the Water Resources Division.

tion Center (WRSIC), press release, and note for monthly list of new publications, as applicable, along with an up-to-date routing sheet to all colleague reviewers.
- Assure that all illustrations and tables are neat, legible, and complete.
- Acknowledge and incorporate all comments by colleague reviewers or give reasons for not accepting.
- Personally acknowledge, by memorandum, efforts by colleague reviewers.
- Forward all marked-up review copies with the manuscript to the next review/evaluation step.

Quality Assurance in the Water Resources Division

Reviews of project-and-report planning and project elements at prescribed intervals will help authors prepare timely reports of high quality. The steps listed in the project report schedule (fig. 3) before colleague review are preliminary parts of a quality assurance system that has evolved over the years. Colleague review is the key element in the system.

Colleague Review—the Cornerstone of Quality Assurance

A report is reviewed by colleagues after an author, supervisor, and District or Project Chief agree that it is ready (usually after several drafts have been prepared). The Water Resources Division requires that at least two colleagues review all manuscripts, including at least one review from outside of the author's organizational unit. A report authored by someone in the Colorado District, for example, must be reviewed by someone outside the Colorado District's organization, perhaps in another State. Similarly, a report authored by someone in a regional research project office must be reviewed by someone outside that project, and preferably in another region. Long experience has shown that a fresh, unfamiliar viewpoint has real value in detecting flaws of logic and errors of omission and commission in manuscripts.

Colleague review is arranged by supervisors, who informally contact a District or Research Project Chief to ascertain the availability of someone to review the report in the time desired. Sometimes a person with special knowledge is requested.

Commonly, however, the contacted District or Project Chief will agree to provide a colleague review by someone on the staff. The responsibility for the colleague-review process (Olcott, 1985) is shared as follows among District Chiefs, Research Project Managers, and the designated reviewers:

District Chiefs and Research Project Managers

- Become personally involved in the review process. Read the report—especially for technical and editorial adequacy and Survey policy.
- Accept reports from other organizational units and allow time for their review by technical people in your charge.
- Train personnel in techniques of colleague review.
- Insist on at least one out-of-office colleague review of all technical reports produced under your supervision. A subdistrict report reviewed by colleagues in another subdistrict in the same State would not count for the out-of-office review.
- Insist on full consideration of all review comments by authors, and help monitor author responses.
- Include colleague review as part of the duties and performance standards of all professionals.

Reviewers

- Ensure technical soundness and clarity of the report.
- Suggest alternative methods of analysis or interpretation, if appropriate.
- Devote adequate time to check mathematics, methods of approach, organization, soundness of conclusions, adequacy of data to support conclusions, accuracy and adequacy of illustrations, tables, and presented data.
- Clearly indicate problems through well-thought-out, legible marginal comments, and a summary memorandum.
- Avoid humorous, sarcastic, or derogatory comments.
- Maintain a positive attitude toward colleague review duties.

Following colleague review and after the author's response and rewrite, the District or Research Project Chief reevaluates the manuscript. If it is found to be satisfactory, it is transmitted to the appropriate Regional Hydrologist with a request that it be approved for publication. The manuscript package includes the complete review copies of the report (reviewed by colleagues), the colleagues' summary evaluations, and other materials as shown by Finch and Aronson (1985).

Regional Evaluation

All reports generated in a particular region (district and research program) are evaluated in the office of a Regional Hydrologist. After receipt of a report, the

PROJECT REPORT SCHEDULE

Project _____
Report title _____
Author(s) _____
Intended audience _____
Report type and publication medium _____

Report schedule	*Target date*	*Completion date*
Planning and prewriting		
Preliminary report outline		
Base map request		
Initial annotated outline or preliminary report		
Table plan		
Illustration plan		
Final annotated outline or preliminary report		
Writing, self-editing, and rewriting		
First draft		
Author's review and revision		
First typing		
Editing and review		
Editorial review		
Author's revision		
Section chief or discipline specialist review		
Author's revision		
Assistant district chief or district chief's review		
Author's revision		
First colleague review		
Author's revision		
Second colleague review		
Author's revision		
Final typing and editing		
District chief's review		
Approval and publication		
Transmittal to region		
Report approval		
Report publication		

Support needed

Maps _____
Typing _____
Drafting _____
Consultations _____
Special illustrations _____
Report review
Technical _____
Editorial _____
Suggested reviewers _____
_____
Other _____
_____

Figure 3. A project report schedule used in Districts of the Water Resources Division.

Regional Reports Advisor determines the following:

1. The title is appropriate and complete (dates and places included if necessary).
2. The contents reflect topics in the title.
3. The abstract and summary or conclusions are consistent with the title, contents, and each other.
4. Illustrations and tables are appropriate and complete.
5. Numbers in text, tables, and illustrations have been verified.
6. Annotations for references cited are complete and in Survey style.
7. The manuscript has received adequate colleague review.
8. Authors have responded appropriately to all reviewers' comments.
9. Manuscript complies with Geological Survey policy.
10. Manuscript is organized in a way that readily conveys its information to a reader.
11. Manuscript is technically accurate and methods used are appropriate and properly explained.

If any technical aspect of the manuscript is questioned, the Regional Reports Advisor will request additional evaluation by a Regional discipline specialist or a recognized expert in the appropriate subject on the staff of the Regional Research Hydrologists.

If serious technical, organizational, or policy problems remain, the manuscript will be returned via the author's supervisor for additional work, accompanied by specific suggestions on ways to overcome the deficiencies. If there are no serious problems or deficiencies, the manuscript is sent to Headquarters with a recommendation that it be approved by the Director and that suggestions made in the Regional office be considered and responded to by the author after Director's approval.

The Director delegates authority to the Regional Hydrologists to approve basic data reports, interpretive reports intended for refereed journals, and abstracts for presentations at professional society meetings and conferences; some Regional Hydrologists redelegate authority to District Chiefs to approve basic data reports. All other interpretive reports require Director's approval, including administrative reports and all other writings such as textbooks, book reviews, field-trip guidebooks, newsletters, and comments and replies for technical journals.

Headquarters Evaluation

When a manuscript is received at Headquarters, it is logged into the Water Resources Division's Report Tracking System in the Publications Management Unit (PMU). Abstracts (including copies of the abstract for the Water Resources Scientific Information Center) are circulated to 14 offices, including the Assistant Chief Hydrologists; Chief, Office of Ground Water; Chief, Office of Surface Water; Chief, Office of Water Quality; and Chief, Branch of Scientific Publications. These abstracts are reviewed for information content, and if of special interest, their related manuscripts are requested for review. The Office of Surface Water, for example, reviews almost all reports on surface-water hydraulics.

All manuscripts that contain geologic names are routed to the Geologic Names Committee for verification of stratigraphic nomenclature. Illustrations for all manuscripts designated for publication in formal U.S. Geological Survey book or map series—Water-Supply Papers, Professional Papers, Bulletins, Circulars,

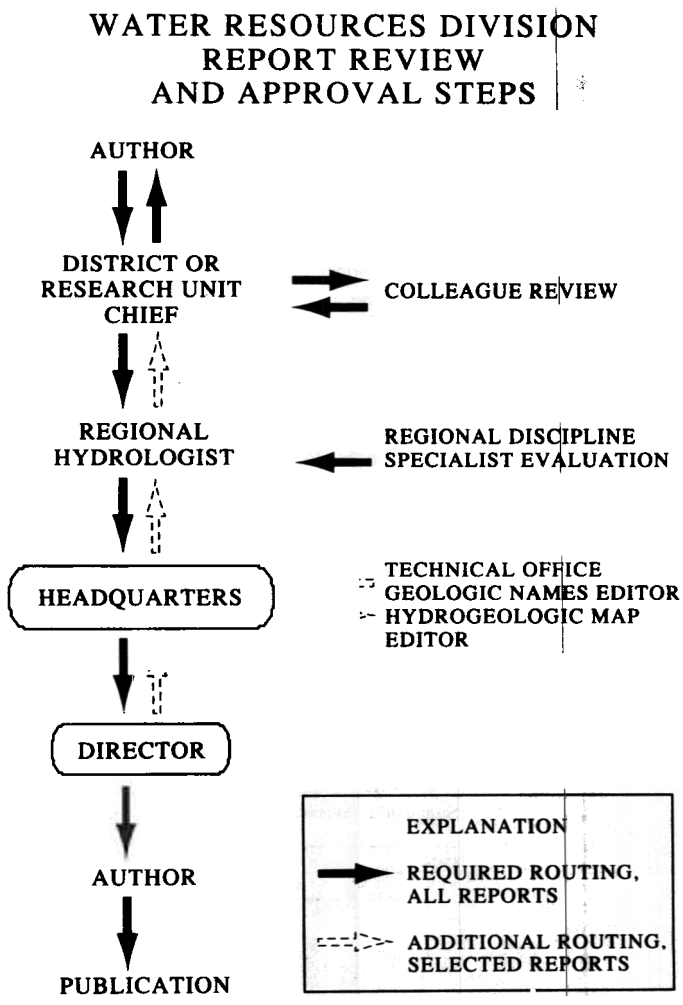


Figure 4. Generalized diagram of the manuscript approval process in the Water Resources Division.

Hydrologic Investigations Atlases, or Miscellaneous Investigations Maps—are reviewed by the Hydrogeologic Map Editor. After these steps are completed, manuscripts are transmitted to the Staff Hydrologist for Reports, who reevaluates the same 11 aspects of the report evaluated by the Regional Reports Advisor. If the Staff Hydrologist for Reports is unfamiliar with the technical content of a manuscript, or has reservations about it, a discipline expert will be contacted for additional evaluation. Most discipline experts who are consulted work at Headquarters in the Offices of Ground Water, Surface Water, or Water Quality. Occasionally, experts are consulted from the Office of Hydrologic Research, Branch of Systems Analysis, Geologic or National Mapping Divisions, or academia.

If a manuscript is judged to be technically adequate, and if it meets quality standards, it is sent to the Director for approval. The Director has designated the Associate Chief, Office of Scientific Publications (Geologic Division) to approve or reject all reports after skimming them for content and policy. All manuscripts are then returned to the Publications Management Unit for transmittal to the author, if approved, or to the Regional Hydrologist if rejected. Figure 4 shows generalized steps in the manuscript approval process.

AUTHOR'S RESPONSIBILITIES AFTER DIRECTOR'S APPROVAL

Although Director's approval is a critical milestone in the Survey publications process, an author's responsibilities do not end there. Authors have important and necessary further responsibilities through the actual printing and distribution of the report.

PREPARING MANUSCRIPTS FOR PRINTING

An author's euphoria on receiving manuscript approval is soon tempered by the reality of responding to the reviewers' comments, suggestions, and directions accumulated by the manuscript during the approval process. Authors are expected to respond fully to all such comments, and to seek clarification directly from the reviewers, if necessary. For reports published or released by the author's offices (Water-Resources Investigations Reports and Open-File Reports) this step is generally the last quality-control check for technical content prior to printing.

In the formal report series (Water-Supply Papers, Professional Papers, Circulars, Hydrologic Investigations Atlas, for example) book reports are carefully edited for completeness and consistency by the Branch of Technical Reports (Geologic Division); map reports are similarly edited by the Publications Management Unit (Water Resources Division). Edited text and drafts of illustrations are sent to authors for proofing before final drafting and typesetting. It is imperative that authors schedule time to adequately review the edited text and drafts of illustrations. Similarly, authors must review galley or page proof of typeset text and proofs of final-drafted illustrations. This review is the author's last chance to assure the technical accuracy of the report before printing, and it must be done within the time allotted to assure no delay in printing. Authors will sometimes be asked to examine printer's page proofs. For special jobs, perhaps involving color, authors may participate in press inspections at a printing plant.

In many offices, authors of locally published informal reports must read proof in the various stages of the printing process. Detailed instructions for processing water-resources manuscripts after Director's approval are given in Alt and Iseri (1986, beginning on page 286).

RELEASING AND DISTRIBUTING PUBLISHED REPORTS

To assure timely and equal availability to the public, most reports of the Water Resources Division are announced in releases to local news media. The remainder are announced only in "New Publications of the U.S. Geological Survey," issued each month. Authors outside Water Resources Division, as well as inside, could profit from the following procedures.

About 2 weeks before the scheduled delivery of printed reports that are to be announced by news release, authors should ascertain that the persons responsible for releasing reports have approved copies of the news release, a distribution list, and appropriate transmittal memorandums. When the printed copies are received, public-inspection copies are to be mailed to depositories. The issue date for the news release should be set to allow time for copies to reach depositories. Comprehensive instructions for the disposition of printed copies of reports are given in Alt and Iseri (1986, p. 329).