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GEI
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GEOSCIENCE INFORMATION SOCIETY

NEWSLETTER

No. 22 February 1973

GIS PRESIDENT'S COLUMN

In January, Federal budget-cutting almost claimed the American Geological Institute's GEO-REF system, which provides camera-ready copy to the Geological Society of America's *Bibliography and index of geology* as well as other information services to the geoscience community, when the National Science Foundation (NSF) announced on 27 December 1972 that it was not funding AGI's terminal grant request for the GEO-REF system (see following article). A massive letter-writing campaign organized by AGI produced the desired NSF response on 17 January 1973 and the GEO-REF system was granted additional funds to operate until 30 June 1973. If these funds had not been granted, GEO-REF would have had to shut down on 19 January 1973. I was told that further support by NSF of the GEO-REF system depends on the financial support generated from the geoscience community. Therefore, the GEO-REF system is not yet out of the woods.

Recognizing GEO-REF's importance to many of our members, the GIS Executive Committee voted to donate \$500 for the support of the GEO-REF system. With the additional \$2.50 per-member contribution added to the \$2.00 per-member AGI dues, GIS contributions to AGI and GEO-REF represent 45 percent of GIS membership dues for this year and, therefore, must be considered a one-time-only donation.

More help is still needed. Donations of all sizes are welcome and will show the concern of the geoscience community to NSF. Send them to Dr. Linn Hoover, Executive Director, American Geological Institute, 2201 M St, N.W., Washington, D.C. 20037. Remember, funding for 1974 depends on the support of the geoscience community now.

I would like to discuss the report of Dr. C.F. Burk's GIS Objectives and Policy Committee (see *GIS Newsletter*, Dec 1972, no.21, p.5-6) and what I believe to be our Society's purpose for existence. I feel that the constitutional purpose is valid. Each Executive Committee should strive to meet both the service and the professional aspects of this purpose. We have yet to achieve the proper balance, but will work for it. We have extended the *GIS Newsletter* to six issues per year; I'm sure the editor would welcome short papers for inclusion in the newsletter. For a regular professional journal sponsorship to be viable, members would have to be willing to contribute. I would like to hear from those willing to supply material related to our present Society constitutional purpose (broadly interpreted).

In the area of organizational affiliation, I feel we are properly placed. The recent reorganization of AGI has helped to increase our voice. We

are free to meet with other societies and I recommend that we have additional meetings with them. The Geological Society of America still offers us the most diverse audience. AS GIS Program Chairman last year, I discovered that our affiliation with GSA was very helpful in putting the program together. Many interesting speakers would not be available unless we were able to provide for their expenses.

The GSA has also requested that GIS supply a topic for a Penrose Conference. When I know more about the requirements to sponsor one, I will inform you.

In conclusion, I feel the Society has come far since 1965. Problems exist and need to be worked out, but I'm sure we will succeed.

Hartley K. Phinney, jr.
GIS President, 1973

AGI's GEO-REF: NATION'S GEOLOGISTS RESPOND VIGOROUSLY TO AVERT IMPOUNDMENT CRISIS

GIS Offers Financial Support

On 2 January 1973, "an urgent appeal for ... help in saving a vital information service for the geological community and the mineral resources industry" was widely issued by the American Geological Institute to the nation's geoscientists. The basis of the appeal was the news from the National Science Foundation (NSF), received by AGI on 27 December 1972, that the Institute would not receive any further support for GEO-REF beyond 31 December 1972. According to Dr. Linn Hoover, executive director of AGI, "this precipitous and arbitrary action, taken just four days before the end of the current GEO-REF grant period, can result in incalculable damage to research and production programs in government, industry, and the universities".

GEO-REF is the computer-based bibliographic file of the world's geologic literature, maintained since 1970 by AGI. It is a multi-purpose system that provides printed bibliographies, searchable magnetic tapes, monthly printouts of current references designed to meet specific user requirements, retrospective answers to queries, and indexes for primary scientific journals. There is no comparable geologic information service in any other language, nor is there another English-language source of total information to the world's geologic literature. The GEO-REF file is now approaching 200,000 deeply indexed citations to the world's geologic literature and is growing at a rate of about 60,000 new citations annually.

Financial support for GEO-REF is derived from income

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from the users of the service, supplemented by an annual grant from NSF. The Foundation has already invested \$2,694,300 in GEO-REF and related geoscience information activities, beginning in 1966. However, each NSF grant has been based on a steadily decreasing percentage of the project's annual budget as GEO-REF moves toward self-sufficiency. It has been AGI's understanding from the beginning that NSF would assist GEO-REF for a reasonable amount of time, provided that the system showed progress in achieving self-support, and that NSF funding would cease completely when GEO-REF became fully operational and self-supporting.

In November 1971, AGI predicted that the GEO-REF service would attain financial independence by the end of 1975. In providing the funds requested by AGI for 1972, NSF cut the period of projected deficit support by one year. By accepting the 1972 NSF grant award, AGI agreed that the goal of making GEO-REF independent of NSF subsidy by the end of calendar year 1974 is "reasonable and attainable" and that AGI "will make every effort to reach this goal".

In mid-1972, NSF requested AGI to submit a two-year budget for 1973-1974, to constitute a terminal grant for GEO-REF, together with an updated plan to reach self-sufficiency by the beginning of 1975. This request was met by a proposal asking for \$330,000 in 1973 and for \$255,000 in 1974. On 18 December 1972, AGI representatives met with an NSF official and were told that the 1973-1974 proposal, with some small changes, was ready for processing. Then, right after Christmas, AGI was told that NSF funding for the project would be cut off forthwith, effective 31 December 1972.

The reason for the abrupt termination of funding resulted from the decision of the Office of Management and Budget to hold in reserve (impound) about \$62 million of NSF's budget during fiscal 1973. The money being withheld affects NSF's support of discipline-based scientific information activities and some educational programs. This non-selective action was taken "across the board", but AGI was particularly affected because GEO-REF cannot survive for the next two years without deficit operational support.

According to Thomas B. Owen, NSF's assistant director for national and international programs, the Foundation's limited funds for support of information activities and the need to apply stringent priority criteria to the many worthy projects competing for support "forced" the Foundation "to give serious consideration to the relative importance of continuing support for the GEO-REF activity, vis-a-vis other important activities, and to explore with AGI officials the impact of an early curtailment of NSF funding".

It must be emphasized that the serious threat imposed by the impoundment crisis was not the result of any dissatisfaction with or criticism of GEO-REF per se. Rather, in attempting to adjust to the sudden squeeze, the director's office of NSF curtailed all further funding for fiscal 1973 in its Office of Science Information Service. In

spite of prior agreements and assurances, GEO-REF was trapped in the pipeline.

The broad-based appeal by AGI for support of GEO-REF resulted in more than 200 letters and telephone calls to NSF from concerned individuals all over the country. Geologists, societies, State surveys, government agencies, industrialists, information specialists, and Senators and Congressmen poured letters into the NSF director's office protesting the precipitous action. NSF was reportedly surprised by the solid show of concern by the geologic profession, and was also impressed by AGI's ability to generate such wide support in a short period of time.

The reaction of the geological community and concerned users of the GEO-REF system caused the Foundation to reconsider its decision and make adjustments in its priorities. By withdrawing funds from other grants already made, NSF has restored \$150,000 to support GEO-REF through the six months ending in June 1973 (this is little less than one-half of the amount AGI requested for calendar year 1973), with near assurance of further funding for the last half of calendar year 1973 when NSF receives its fiscal 1974 budget. Although no definite information is available for 1974, it is hoped that the earlier agreement will be honored, allowing GEO-REF to move toward self-support in 1975. Prospects of funding in 1974 will probably depend upon demonstration of real backing and tangible support of GEO-REF by the users of the system.

GIS reacted promptly to AGI's appeal. Letters to Dr. H. Guyford Stever, director of NSF, were sent by Hartley K. Phinney, jr., president of GIS, and by Dr. Roy W. Graves, past president of GIS and the GIS representative on AGI's Governing Board.

In his letter of 16 January 1973, President Phinney said: "I am writing to express the concern of the members of the Geoscience Information Society over the recent terminal grant denial to the American Geological Institute for the GEO-REF program. In my conversation with ... [an NSF official] I mentioned that one of the spinoffs of the GEO-REF program is the Geological Society of America's *Bibliography and index of geology* which now is the largest reliable English-language index to the earth sciences since the publication of the USGS' *Abstracts of North American geology* and *Geophysical abstracts* were cancelled in 1971 and their areas of interest added to the GEO-REF program. Shutdown or curtailment of the GEO-REF program will leave much of the earth sciences and almost all of geophysics unindexed in the English language. Therefore, we request that you reconsider the decision to deny the terminal grant to AGI for the GEO-REF program and support it".

In his letter of 12 January 1973, Past President Graves wrote: "On behalf of the membership of the Geoscience Information Society, as well as our Executive Committee and myself, I urgently appeal for reconsideration of the decision to withdraw National Science Foundation financial support for the American Geological Institute's GEO-REF information system. Our Society of about 200 members, mostly from

North America but many from abroad, is composed of industry, university and government scientists, librarians, documentalists, editors, and other information specialists whose daily professional activities are concerned with the handling of geoscience information. Such being the case, our membership is highly sensitive to the value to the Geosciences Profession of an extensive information system such as GEO-REF. All of us do not agree, I am sure, on some aspects of handling, implementation, or processing within the System, but I do know that essentially all would agree that the GEO-REF concept is of tremendous value in the field of geoscience information. I repeat, therefore, my plea for reinstatement of National Science Foundation financial support for this activity of the American Geological Institute".

NSF has emphasized the need for AGI "to exert more effort in obtaining increased support from other sources in order to prevent another crisis in 1974". Donations from non-governmental sources will be sought (e.g. Chevron Oil Field Research Company has contributed \$500, and hopefully other petroleum companies will also make contributions). As of mid-February 1973, GIS was the only member society of AGI to make a monetary contribution: although the \$500 offer may seem to be a token donation, it nevertheless represents almost one-fifth of the Society's treasury.

In order to reach the goal of self-sufficiency by 1975, an unremitting drive must be initiated to make use of the many services that can be provided by GEO-REF--such as retrospective searches, tape leases, SDI profiles, primary journal indexes, and special bibliographies. GIS members are urged to contact AGI with offers of assistance in explaining the GEO-REF system to potential users and/or buyers. The GIS Executive Committee will be considering various ideas regarding assistance to GEO-REF on operational procedures, such as providing input from GIS volunteers or by serving as an advisory body that would review, study, and evaluate GEO-REF objectively. In the meantime, AGI is tightening its belt and seeking cost-saving directions, without reducing the efficiency of the system, to assure self-sufficiency in 1975.

1973 GIS ANNUAL MEETING in DALLAS, Tex.

The 8th Annual Meeting of the Geoscience Information Society will be held in Dallas, Tex., during the annual meetings of the Geological Society of America and its associated societies, 12-14 November 1973. The GIS program chairman is Vice-President Marjorie W. Wheeler (Science-Technology Library, Lamar Univ, Box 10021, Lamar Univ Station, Beaumont, Tex. 77710; phone 713/838-8934).

The planning committee includes: Aphrodite Mamoulides (Shell Development Co., Houston); Beverly Holmes (Southern Methodist Univ, Dallas), in charge of a possible workshop on government programs and publications of interest to geologists; Margaret McLean (Atlantic Richfield Co., Dallas),

in charge of luncheon and social events; and Henry Yarbrough (Mobil Research & Development Corp., Dallas), moderator of the technical session.

Marge writes that "because there has been some interest shown in GISers getting acquainted for fun, we are thinking of having a cocktail hour or a combination cocktail-and-dinner get-together some night". She asks for a show of interest concerning this--so, please let her know what form of social activity you would like to have at your Annual Meeting.

GIS AFFAIRS

*** President Phinney has made the following appointments: Dr. Roy W. Graves (Univ of Tulsa) as GIS Representative to the AGI Governing Board, until the end of 1973; and Mary Woods Scott (Univ of North Dakota) as chairman of a committee looking into GIS membership activities.

*** Volume 3 of the *GIS Proceedings*, consisting of the papers given at the technical session during the 1972 Annual Meeting, will be available later in the Spring from the GIS Secretary. Price: \$5. GIS members in good standing will receive complimentary copies.

*** Mark W. Pangborn, jr. (U.S. Geological Survey, Washington, D.C.) is currently revising and updating *A buying list of 100 good geology books for the high school library*, a 7-page leaflet published in 1967 by GIS and the National Association of Geology Teachers. The number of "good" geology books may increase to 150. The revised list is scheduled for a summer publication date.

*** DUES ARE DUE!! Your \$10 dues for 1973 will help your Society in its forthcoming programs and projects. Members of record have received their dues notices; checks should be payable to "Geoscience Information Society" and mailed to the GIS Secretary (address on page 8).

GISers in the NEWS

C.F. Burk, Jr., national coordinator of the Canadian Centre for Geoscience Data, has been named to the publications committees of the American Geological Institute and the Geological Society of America. The GSA committee is trying to develop a new program whereby bibliographic services to members would be provided in a more personalized, responsive fashion.

Roza Ekimov has been transferred from Los Angeles to Denver where she is exploration librarian at Exxon Company, U.S.A., P.O. Box 120, Denver, Colo. 80201.

Rita K. Llaverias, formerly with the ERIC Clearinghouse on Teacher Education, is now director of technical information for Automated Typographics in College Park, Md.

Robert McAfee, jr., assistant to the executive director of the American Society for Information Science, has been appointed director of member and education services at ASIS.

Clarence A. Sturdivant of Marathon Oil Co., Littleton, Colo., has been elected secretary-treasurer of the Frontier Chapter of the American Society for Information Science.

NEW MEMBERS OF GIS

- Eaglesfield, Mrs. Jaunette: Librarian, Geological Sciences Library, Harvard Univ, 24 Oxford St, Cambridge, Mass. 02138
- Murdock, Lindsay R.: Librarian, U.S. National Oceanic & Atmospheric Administration, Dept of Commerce, Boulder, Colo. 80302
- McCosh, Mrs. Bonnie: Editor, *Oceanic instrumentation reporter*, Ocean Engineering Information Service, P.O. Box 989, La Jolla, Calif. 92037
- Turner, Philip A.: Computer Programmer, U.S. Army Coastal Engineering Research Center, 5201 Little Falls Rd, N.W., Washington, D.C. 20016
- Walton, Ronald J.: Computer Systems Administrator, U.S. Army Coastal Engineering Research Center, 5201 Little Falls Rd, N.W., Washington, D.C. 20016

LITERATURE CITATIONS

(GISers indicated in UPPER CASE)

- Aiyepoku, Wilson O. (1972) *The periodical literature of geography*. Libri, v.22, no.3, p.169-182.---A quantitative analysis of periodical articles in geography and how these are distributed among periodical titles; e.g. to cover 90% of the world total output of periodical articles in geography, one need only bother with 49.4% of all periodical titles.
- Bellamy, John C. (May 1970) *Geosection indices for environmental data*. Laramie: Wyoming Univ, Water Resources Research Institute. 39p. (PB-202-162).---A system of "geosection" index numbers is proposed for cross-indexing many different kinds of environmental data by identifying the horizontal sections of the "geosphere" to which any particular environmental data pertain. The index numbers can be used to identify observing stations and to order indexes, tabulations, and files of environmental data from observing stations.
- Buginas, Scott J., and CROW, NEIL B. (Jan 1973) *The computerized file management system; a tool for the reference librarian*. Special libraries, v.64, no.1, p.12-17.
- Demayo, A. (1970) *A storage and retrieval system for water quality data*. Canada. Dept of Energy, Mines and Resources. Inland Waters Branch. Report series no.9. 38p.---Description of NAQUADAT System (National Water Quality Data Bank).
- Krzonkalla, Peter (June 1972) *Fachreferent und Abteilungsleiter: Ergebnisse von Zeitstudien*. Bibliotheksdienst, v.6, p.242-246.---Results of a time-and-motion study conducted over an 8-12-week period in the Geological Faculty of Berlin Technical Univ. Tabulated results show the distribution of staff time over 13 tasks. Up to 20% of the work required the attention of senior professional staff.
- Laffitte, Pierre, ed. (1972?) *Traité d'informatique géologique*. Paris: Masson. 624p. 190F.---Covers every aspect of computers in geology, from sorting bibliographic files to modelling a basin or finding a CIPW norm.
- Lewis, Jesse L., and others (Sept 1971) *Making information out of data*. Water Pollution Control Federation. Journal, v.43, no.9, p.1902-1911.---Describes the STORET (Storage and Retrieval) system of the U.S. Environmental Protection Agency.
- Murty, A.T. (March 1972) *Use of bibliographical tools*. Indian librarian, v.26, no.4, p.182-186.---Results of a survey carried out into the use of bibliographic tools by teachers and researchers in physics and geology at the Vikram Univ, Ujjain, showed that the use of subject bibliographies and bibliographic reviews is limited in geology, but indexing and abstracting journals are adequately used.
- Shaw, S.H. (1972) *Automated geological cartography*. Commonwealth Geological Liaison Office. Liaison report 116. 10p.---Describes map production at the Experimental Cartography Unit.
- U.S. Geological Survey (1972) *Publications of the Geological Survey, 1962-1970*. Washington: Govt. Print. Off. 586p. free.---Permanent supplement to *Publications of the Geological Survey, 1879-1961*. Lists "books", and maps & charts, with indexes for subjects, areas, USGS research, and authors.
- Wellisch, H.H. (June 1972) *A survey of indexing and abstracting services for water resources engineering*. College Park: Univ of Maryland, School of Library and Information Services. 95p. (Technical report no.11).---Comprehensive review of 46 secondary services, analyzed by subject, content, historical elements, coverage, frequency, price, language, and other parameters.

EXCHANGE OF GEOSCIENCE MATERIALS

J. Charles Levesque (Earth Physics Branch Library, Dept of Energy, Mines and Resources, Ottawa K1A 0E4, Ontario, Canada) has suggested that GIS organize a clearinghouse-type exchange for the listing of desiderata and available library materials. Because of staff problems, very few geoscience libraries and information centers could become involved in maintaining such a service.

However, depending on the volume of material to be listed, the Earth Physics Branch Library might be

able to list materials in the library's computer and search the data base on a request basis from cooperating libraries. In order to study the feasibility of such a service, Mr. Levesque requests that any geoscience library or information center interested in an exchange system contact him. From the respondents, a random sample could be drawn, lists of materials requested, and a statistical summary compiled that would give an idea of what is involved in creating an exchange system. Those GISers interested in such a system are urged to contact Mr. Levesque.

JAMES R. RANDOLPH

GIS charter member James R. Randolph, 45, died of a heart attack 20 September 1972 in Bethesda, Md. At the time of his death he was chief of the Water Information Group of the U.S. Geological Survey, Washington, D.C. A native of Fairport, N.Y., Mr. Randolph graduated from the Univ of Rochester and received his master's degree in geology from Lehigh Univ. He began his career with USGS in 1953, assigned to the Ground Water Branch.

During the 1960's, Mr. Randolph was instrumental in preparing the annual bibliographies of hydrology in the U.S. and Canada, and special bibliographies on remote sensing, artificial recharge, and estuarine sedimentation. He also established a continuing system of abstracting and indexing materials for the Interior Dept's Water Resources Scientific Information Center.

In 1968, he was placed in charge of the Water Information Group with activities including the answering of questions on water resources for Congressmen, scientists, industrial and educational groups, students, and the general public. He assisted in establishing a Water Resources Division reference library, a principal collection of its kind in the USGS.

Mr. Randolph is survived by his wife, two daughters, and a son.

NEWS FROM AGI

*** The complete list of serials used in the GEO-REF system will be available by the end of March 1973. Copies can be obtained at nominal cost or by special arrangement from the AGI Director of Science Information, 2201 M St, N.W., Washington, D.C. 20037, or phone 202/296-7950.

*** The new chairman of the AGI Committee on Geoscience Information is James Mello of the Smithsonian Institution's National Museum of Natural History. Roy C. Lindholm of the Dept of Geology, George Washington Univ, has been added to the committee. The committee has been discussing a "primary" (advanced) abstract journal.

ERRATUM

Dr. Harold L. Cousminer, co-editor of the *Bibliography and index of micropaleontology* published by the American Museum of Natural History, was misquoted in the December 1972 issue of the *GIS Newsletter* (no. 21, p.1) in regard to the subscription rates to the bibliography. In the paper he presented at the GIS technical session during the 1972 Annual Meeting of GIS in Minneapolis, he gave the following rates for the bibliography: individuals (\$10); institutions (\$40); and corporations (\$100). These rates are one-half of those cited for the bibliography in the previous newsletter. Rates for the index are equivalent, and would therefore double the total price.

GEOSCIENCE DOCUMENTATION PUBLICATION SCHEDULE

Due to problems with the phototypesetter, the bi-monthly publication *Geoscience documentation*, published by Geosystems, London, had temporarily suspended publication following the v.3, no.5 issue (1971). The following is the publication schedule that brings the publication up-to-date and for the remainder of volume 5 (1973):

<u>volume and part</u>	<u>date published</u>
v.3, no.6 (1971)	16 Feb 1973; index to v.1-3
v.4, no.1-2 (1972)	9 Feb 1973
v.4, no.3	9 Feb 1973
v.4, no.4-5	28 Feb 1973
v.4, no.6	30 March 1973
v.5, no.1-2 (1973)	27 April 1973
v.5, no.3	31 May 1973, on schedule
v.5, no.4	31 July 1973, on schedule
v.5, no.5	28 Sept 1973, on schedule
v.5, no.6	30 Nov 1973, on schedule

25th INTERNATIONAL GEOLOGICAL CONGRESS Preliminary Announcement

The 25th International Geological Congress (IGC) will be held in Sydney, Australia, from 16 to 25 August 1976, under the sponsorship of the Australian Academy of Science and the Geological Society of Australia. Pre- and post-Congress excursions are being arranged throughout Australia, and the geologists of New Zealand and of Papua New Guinea have also agreed to organize excursions in association with the IGC.

The Organizing Committee is anxious to establish a distribution list for the First Circular, which will be available in October 1973. It will be distributed automatically to those whose names and addresses appear in the List of Registrants for the 24th IGC (1972), and to major geological institutions. Others who wish to receive it are asked to write, if possible by 30 June 1973, to:

The Secretary-General
25th International Geological Congress
P.O. Box 1892
Canberra City, ACT 2601, Australia

MULTILINGUAL THESAURUS FOR TECTONICS

The first draft of *Multilingual thesaurus for the geological sub-field "Tectonics"* was issued in July 1972 by the Bureau de Recherche Géologique et Minière (BRGM), Orléans, France. This thesaurus is a result of the work done by the joint working group of the Committee on Geological Documentation of the International Union of Geological Sciences and of the Abstracting Board of the International Council of Scientific Unions.

The purpose of such a thesaurus is to: (1) eliminate the ambiguities that exist in the use of unstructured dictionaries; (2) extend the international exchange of information through a framework of language agreed upon by the communicants; (3) facilitate the accurate indexing of foreign-language literature; (4) possibly create a common philosophy of indexing among the cooperating services; and (5) consider the establishment of a common code that would provide an artificial language to facilitate the exchange and retrieval of information.

Tectonics was selected for the pilot project because of the nonambiguity of its terms and because it presented a workable number. A source definition of terms was available in the American Geological Institute's *Glossary of geology*, the tectonics section of which was distributed to the members of the working group for preliminary study. The thesaurus is the result of correspondence between members and a few meetings of the entire working group. It has been prepared for each language entry by the language representatives (Czech, German, English, French). The complete multilingual thesaurus has been compiled by the BRGM. The final draft is to be computer-processed.

For further information, contact: Dr. L. Delbos, Dept Documentation, BRGM, B.P. 6009, 45018 Orléans CEDEX, France.

WORLD DATA CENTER A and UPPER MANTLE PROJECT

The Upper Mantle Project (UMP) terminated in 1970. The International Upper Mantle Committee held its final meeting and symposium, and was disbanded in August 1971. The publication of the final UMP symposium appeared in July 1972. Most national Upper Mantle Committees prepared their final reports and were disbanded by the end of 1971.

Accordingly, it was decided to terminate the activities of the subcenter of World Data Center A (WDC-A) for the UMP at Lamont-Doherty Geological Observatory in June 1972. The archives of the UMP subcenter have been transferred to the WDC-A subcenter in Boulder, Colo., where they will be accessible in conjunction with the other solid-earth data in that subcenter. At present, the solid-earth section of WDC-A in Boulder includes geomagnetism, gravity, and seismology. This subcenter of WDC-A will probably serve as the subcenter of

WDC-A in connection with most sections of the new Guide to Solid-Earth Data Exchange through the WDCs (now in preparation).

The address of the UMP archive is: World Data Center A, Environmental Data Service, U.S. National Oceanic and Atmospheric Administration, Boulder, Colo. 80302.

RUSSIAN GEOSCIENCE DOCUMENTATION

Articles published recently in *Nauchno-tehnicheskaiia informatsiia; seriia 1: Organizatsiia i metodika informatsionnoi raboty* pertaining to geoscience information include:

Konshin, G.I., and Liatskii, V.B. (1971) *Metod statisticheskogo mnogoaspektного analiza dokumental'noi geologicheskoi informatsii i tendentsii razvitiia geologicheskikh znaniia* (Statistical and multi-aspect analysis of documentary information in geology; a method for state-of-the-art study and forecasting of the trends of geological research). No.6, p.14-17.

Novikova, T.Ia. (1970) *Informatsionnye potrebnosti razlichnykh grupp potrebitel'ei v otraslevoi sisteme nauchno-tehnicheskoi informatsii po geologii* (Needs of various user groups in a geological information service network). No.10, p.8-9.

Novikova, T.Ia. (1970) *Nekotorye voprosy rasseianiia publikatsii po geologii v otechestvennoi periodike* (Scattering of geological publications in Soviet periodicals). No.8, p.15-16.

Novikova, T.Ia. (1971) *O sovershentstvovanii otraslevoi sistemy nauchno-tehnicheskoi informatsii v geologii* (For improvement of the information system for geology). No.6, p.18-20.

Sterlin, D.Ia. (1970) *Opyt raboty informatsionnoi sluzhby ZapsibNIGNI* (Information service at the West Siberian oil-geology research institute). No.3, p.10-13.

WESTERN ASSOCIATION OF MAP LIBRARIES (WAML)

The next General Membership meeting of WAML will be held at Southern Oregon College, Ashland, Ore., 29-30 March 1973. Harold Otness, map librarian at the college and newly appointed vice-president of WAML, will be the host.

The general plan for the meeting is an evening get-together on Thursday, March 29, and meetings on Friday, March 30, with the late afternoon devoted to a trip to Jacksonville, a restored gold-mining town. Performances of the Ashland Shakespeare Festival are scheduled at the time of the meeting. To ease the burden of transportation for those who wish to attend the meeting, a car pool is being arranged by Elizabeth M. Rivero, Irvine Map Library, Univ of Redlands, Calif. 92373.

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The November 1972 issue of WAML's *Information bulletin* (v.4, no.1) contains three papers of interest to GIS members: "Acquisitions problems and solutions in the new map library", by Elizabeth M. Rivero (p. 17-23); "A classification and cataloguing scheme for a small map library", by Herbert Fox (p.24-33); and "Map classification: general theories and specific practice", by Mary Larsgaard (p.34-41).

THE BIBLIOGRAPHY OF CARTOGRAPHY

The *bibliography of cartography*, to be published by G.K. Hall & Co. (70 Lincoln St, Boston, Mass. 02111), is a comprehensive analytic index to the literature of cartography. Maintained in card form in the Geography and Map Division of the Library of Congress for more than 75 years, the bibliography provides author, title, and subject access to books and journal articles relating to maps, mapmakers, and the history of cartography.

The bibliography was originated in the 1870's by Philip Lee Phillips, renowned cartobibliographer and the first chief of the Geography and Map Division. This collection is particularly rich in citations relating to the history of cartography and cartobibliography for the period of Phillips' association (1895-1922).

In recent years approximately 200 serials in the subject fields of cartography, geography, history, and library science have been analyzed and pertinent references carded and added. Also the printed card galleys of all monographic titles added to the collections of the Library of Congress have been screened. The estimated 106,000 cards will be reproduced by offset on permanent/durable, acid-free paper with approximately 30 cards per 10" x 14" page. The estimated 5 volumes will be bound in Class A library binding.

Prepublication price: \$390 in U.S., \$429 elsewhere. After 31 July 1973: \$490 in U.S., \$539 elsewhere. ISBN 0-8161-1008-5.

INFORMATION AND COMMUNICATION IN GEOGRAPHY

The Annual Meeting of the Middle Atlantic Division of the Association of American Geographers was held in Washington, D.C., on 27 January 1973. The program, entitled "Information and Communication in Geography", was chaired by John A. Wolter (Library of Congress).

Among the papers presented were the following:

- "A projected United Nations gazetteer series", by Meredith F. Burrill.
- "Place Name Survey of the United States", by Donald J. Orth.
- "The Library of Congress MARC Program", by Henriette D. Avram.
- "Communication or jargon?", by Gordon C. Hull.
- "Map microfilming feasibility study", by Ray Oman.

NOAA's ENVIRONMENTAL DATA SERVICE

The National Oceanic and Atmospheric Administration's (NOAA) Environmental Data Service (EDS) has initiated a new, single-contact, multidisciplinary environmental data and documentation answering service. Under the EDS "lead center" concept, a user need contact only a single EDS center for a comprehensive answer to his query--whether or not the question concerns the discipline for which the center has responsibility or requires multidiscipline input.

EDS archives and disseminates global environmental science data, information, and literature for all disciplines of NOAA responsibility. It also provides referral information concerning data and literature collections and information services of other agencies and activities.

EDS services and products are provided by four data and information centers:

- National Climatic Center (NCC), Federal Bldg, Asheville, N.C. 28801
- National Oceanographic Data Center (NODC), Rockville, Md. 20852
- Environmental Science Information Center (ESIC), Rockville, Md. 20852
- National Geophysical and Solar Terrestrial (NG&ST) Data Center, Boulder, Colo. 80302 (On 1 July 1972, the National Geophysical Data Center and the Aeronomy and Space Data Center were combined to form the NG&ST Data Center).

The Naval Oceanographic Office (NAVOCEANO) and EDS are making arrangements for the transfer of the first large block of NAVOCEANO data to EDS' NG&ST Data Center, which in turn will make it almost immediately available to requesters. This is the initial transfer in an inter-agency arrangement that will eventually make most of NAVOCEANO's unclassified geophysical data holdings available to NG&ST Data Center users. EDS will soon acquire an inventory of NAVOCEANO's bathymetric data holdings, such as tapes, maps, plots, and microfilm, and will identify those data desirable for incorporation into the NG&ST Data Center's data bank. Initially, highest priority will be given to data for oceanic areas in which NOAA's National Ocean Survey plans mapping projects during the next year or two.

The NG&ST Data Center is making its epicenter data file available in new formats. This file contains information on 51,839 earthquakes (or related events) for the period 1 January 1961 through 31 December 1971. It lists, when available, the date, origin, time, geographic location, focal depth, magnitude, and Modified Mercalli intensity for each event. The new service offers these data sorted geographically on magnetic tape, microfiche, or microfilm.

The ESIC has recently implemented WYLBUR (a name, not an acronym), an interactive text-editing program accessed by remote job entry to the facilities of the Division of Computer Research and Technology, National Institutes of Health (NIH). ESIC will use this system to edit scientific technical manuscripts. WYLBUR was developed by the Stanford Univ Computation Center and adapted for use at the NIH central

computer facility. It is designed to provide on-line users, such as ESIC, with a prompt and comprehensive text-editing facility, without interfering with other jobs being processed by NIH's central computer.

EDS has been designated lead agency for data management and information services for U.S. programs in the International Decade of Ocean Exploration (IDOE). The designation was made by the National Science Foundation (NSF), which is the U.S. coordinator for IDOE. Improvement of worldwide environmental data exchange is one of the U.S. goals for the IDOE. EDS is working with NSF's IDOE office to accomplish this, by establishing a systematic procedure to ensure that the data will be adequately documented, cataloged, housed, and disseminated. NSF data guidelines for IDOE participants stipulate that rapid and widespread dissemination of IDOE data is required. All IDOE program data will be distributed internationally as well as within the U.S.

Several EDS projects in addition to data management have been funded by NSF as part of the IDOE program. To help provide descriptive information that will be useful in conducting scientific and resource exploration studies of the ocean, Germany, the Netherlands, the United Kingdom, and the U.S. will produce historical summaries of sea-surface and air temperatures, and wind speed and direction, dating back to 1860. The EDS' National Climatic Center is coordinator of this international effort, and will produce the series for the Pacific Ocean area.

The NODC will prepare two bibliographies under IDOE's Cooperative Investigation of the Caribbean and Adjacent Regions (CICAR) research program, covering marine biology, and marine geology & geophysics. NODC has previously prepared CICAR volumes on meteorology and oceanography.

For further information on all EDS services and publications, contact Patrick Hughes, Chief, Publications and Media Staff, Environmental Data Service, Silver Spring, Md. 20910.

NEWS NOTES

OCEANOGRAPHIC COLLECTIONS

Texas A&M Univ has received \$90,000 from the Brown Foundation of Houston to expand its oceanographic collections.

ENVIRONMENTAL SCIENCE CITATION INDEX

Johnson Associates Inc. (175 Fifth Ave, New York, N.Y. 10010) is the distributor of a new current indexing service in machine-readable form, entitled "Environmental Science Citation Index", a service of the Environment Information Center Inc., New York. The initial data base provides access to more than 55,000 citations on fully compatible 9-track magnetic tape. Current updates include 1500 citations on a monthly subscription basis from Sept 1972. The index compiles and cross-references environmental material from major peri-

odicals, government documents, proceedings, research reports, newspapers, books, and speeches. The citations are arranged under 21 main-entry categories of environmental material and grouped into six units of ecological study. Magnetic tapes are available for the entire index or any of the six units of study: air environment; energy and resource management; land environment; water environment; environmental health; and solid wastes and miscellaneous. Annual subscription for the entire index and monthly updating tapes is \$3,825; subscription of any of the six units of ecological study is \$975 per year.

REVISION OF UDC 528 (GEODESY, etc.)

On 31 October 1972, the Secretariat of the International Federation for Documentation issued proposal P 72-36 for revision of the Universal Decimal Classification 528 (Geodesy, surveying, photogrammetry, cartography). It was compiled by Mr. Schön (Institut für Angewandte Geodäsie, Frankfurt/Main) from various contributions from Czechoslovakia, East Germany, West Germany, the Netherlands, and U.S.S.R., and correspondence with international organizations (7 pages). Comments are to be solicited by 28 February 1973.

EDITORIAL

Beginning with this issue, the *GIS Newsletter* becomes a bi-monthly publication, with issues scheduled during 1973 for February, April, June, August, October, and December. By doubling the frequency of the newsletter, we hope that news of GIS activities will be more timely and of greater interest.

Also, starting with the current issue, we are charging non-members an annual subscription fee of \$10, a hefty raise from the previous \$2 rate. This has been done in order to help defray the extra costs involved in expanding the frequency of the newsletter. Members, of course, will continue to receive the publication as part of their annual dues.

GIS OFFICERS

President: Hartley K. Phinney, jr., Supervisor, Technical Information Center, Chevron Oil Field Research Company, P.O. Box 446, La Habra, Calif. 90631 (213/691-2241, ext.2366)

Vice-President: Mrs. Marjorie W. Wheeler, Science-Technology Librarian, Lamar Univ, Box 10021, Lamar Univ Station, Beaumont, Tex. 77710 (713/838-8934)

Secretary: Ruth L. Keefer, Reference Librarian, Technical Information Section, Field Research Laboratory, Mobil Research & Development Corp., 3600 Duncanville Rd, Dallas, Tex. 75211 (214/331-6531, ext. 524)

Treasurer: Janet R. Meserve, Subject Cataloger, Subject Cataloging Division, Library of Congress, Washington, D.C. 20540 (202/426-5342); *USE HOME ADDRESS*: 1301 Delaware Ave, S.W., Apt.N411, Washington, D.C. 20024

Past President: Dr. Roy W. Graves, Information Specialist, Information Services Dept, Univ of Tulsa, 1133 N. Lewis Ave, Tulsa, Okla. 74110 (918/939-6531)

APPLICATION OF COMPUTER-BASED INFORMATION SERVICES TO PETROLEUM EXPLORATION IN CANADA

by

C.F. Burk, Jr. *

ABSTRACT: Many geologists currently engaged in the exploration for petroleum resources in Canada are unaware of a growing assortment of modern, computer-based information services available to them at reasonable cost from various public and private agencies. As a result, large volumes of potentially profitable information remain unknown and unexploited, reducing the overall efficiency of Canada's exploration effort.

Computer-based services provide the technology required to cope with the rising flood of geological literature, which will amount to about 100,000 items in 1972, to identify pertinent information from obscure or old sources and to selectively filter it for application to specific exploration needs. While these services cannot offer complete solutions to information problems, or in any way reduce the need for geological experience and judgment, they do provide new tools which can be used to advantage.

Five such services are described, including general bibliographical services offered by GEO-REF (American Geological Institute), Geo-Archive (Geosystems), and Petroleum Abstracts (Univ of Tulsa); specialized indexing services of the Canadian Index to Geoscience Data (Canadian Centre for Geoscience Data); and the national current awareness service, CAN/SDI (National Science Library and Geological Survey of Canada).

Volume of Geoscience Literature

In a recent survey of the world's geological literature, Lea (in press) has estimated that there will be 100,000 items published in 1972. Looking back at the entire history of geological publication, he further estimates that the two-millionth paper in geology appeared in print last year. Two million items! While it is clear that only a small percentage of these would be of interest to the petroleum explorationist in 1972, the absolute number is still overwhelming. How can such a vast literature be used in a practical way? And how can one maintain even a superficial awareness of the current geological literature when about 8,300 items are being published each and every month?

This outpouring of information is impressive not only in magnitude, but in its diversity of sources. Depending on how one defines a "geological" journal, there are from 3,000 to 10,000 journals being published on a regular basis today.

Added to this growing volume of conventional literature, now doubling in size every six years, is the more recent phenomena of the "soft-cover" or "grey" literature, typically consisting of reports filed with various government agencies in fulfillment of legal commitments. In Canada, in the mineral exploration area, most provincial and federal agencies maintain large collections of open-file reports, maps, mineral assessment files, and special collections of data. In this province, the Ontario Division of Mines has a unique collection of over 4,500 assessment reports, a situation repeated in many agencies across the country. University theses comprise another important, but often overlooked, source of information in geology.

A third category of geological information of importance to petroleum exploration, adding still further to the difficulty of finding the right information at the right time, includes a variety of computerized data files being compiled in increasing numbers by government agencies, universities, and computer service bureaus. In Canada, this activity has been given impetus by efforts to establish a national network of such files through a program being coordinated by the Canadian Centre for Geoscience Data. Taking inspiration from well data files developed by the petroleum industry during the sixties, computer-based files are now available in a number of fields, especially geochemistry, field mapping, and fossil fuel and mineral deposits data. This is an encouraging development, but its practical usefulness would approach zero if there were no means of easily finding out which data are available and who has them.

Finding Geological Literature

The purpose of this paper is to indicate some of the newer computer-oriented approaches to getting into, and keeping up with, geological literature and other public information, which might be of value to petroleum exploration in Canada. My contacts with the exploration community indicate that many geologists are unaware of a growing assortment of modern, computer-based information services available to them at reasonable cost from various public and private agencies. As a result, large volumes of potentially profitable information remain unknown and unexploited, reducing the overall efficiency of Canada's exploration effort.

These computer-based services have several advantages, at least in principle, over many of the traditional methods of finding geological literature.

* Canadian Centre for Geoscience Data, Geological Survey of Canada, 601 Booth St, Ottawa K1A 0E8, Canada. Paper presented to the 11th Annual Conference of the Ontario Petroleum Institute in Toronto, 24 October 1972. Permission to reprint this paper from the 1972 proceedings volume of the Ontario Petroleum Institute has been granted by OPI.

Basically, these advantages are the capability of storing very large volumes of information, and of allowing for selective retrieval based on search criteria of the searcher's choice. Traditional methods, by contrast, can deal with only relatively small collections of information at any one time and are searchable with only a few criteria. For example, published bibliographies in book form are often helpful, but there are so many of these now, the Geoscience Information Society is considering the need to publish a bibliography of bibliographies! General, comprehensive bibliographies, such as the *Bibliography and index of geology*, must be so large to even approach being comprehensive that they are now prohibitively expensive to publish by ordinary methods.

There are five computer-based information services which I believe you should be aware of in an exploration context, each of which will be described briefly. They include the GEO-REF file of the American Geological Institute in Washington; the Geo-Archive file of Geosystems in London; *Petroleum abstracts* of the Univ of Tulsa; the *Canadian index to geoscience data* in Ottawa; and finally the CAN/SDI project of the National Science Library in Ottawa.

GEO-REF System, American Geological Institute

The GEO-REF system is a general, worldwide bibliographical service provided by the American Geological Institute in Washington. Their file begins with the 1966 literature and it now contains about 160,000 references drawn from the world literature of geology published in 35 languages.

GEO-REF provides a variety of services which illustrate the flexibility and potential value of computer-based information systems in general. First, the file supplies input to a major monthly publication of the Geological Society of America called the *Bibliography and index of geology* in the form of computer-composed camera-ready copy. Specialized bibliographies in the fields of paleontology and coal geology have also been produced. Annual and other cumulative indexes to many primary journals are provided, again as photocomposed copy ready for publication by the journals concerned. The *Canadian journal of earth sciences* is among these. A second GEO-REF service leases computer tapes to universities, libraries, research institutions, and corporate information centers. This aspect will be described later in connection with the CAN/SDI project of the National Science Library and the Geological Survey of Canada.

Finally, GEO-REF offers retrospective search services to retrieve any portion of the file desired by an individual client. Queries may be submitted to the American Geological Institute and the entire file may be searched for a price of \$25.00 per search, 25¢ per reference for the first hundred, and 10¢ for each subsequent reference. Thus, the cost of selectively retrieving, say, 50 items from the 160,000 in GEO-REF would be \$37.50, or approximately the value of 4.6 hours of the time of a \$16,000 per year geologist.

For additional information on the GEO-REF file, contact: Mr. J.J. Lloyd, Director of Science Information, American Geological Institute, 2201 M St, N.W., Washington, D.C. 20037 (phone 202/296-7950).

Geo-Archive System, Geosystems

Geo-Archive is the other major English-language, worldwide service for geological literature. The system was announced in 1971 by Geosystems, London, as an outgrowth of their current-awareness publication, *Geotitles weekly*, which began publication in 1969. The service currently cites from 50,000 to 75,000 items a year, and the total file contains about 200,000 titles.

The Geo-Archive tape file is available on a subscription basis. Other services offered include the preparation of custom-designed bibliographies, and the matching of interest "profiles" on a weekly basis with new input to Geo-Archive. In addition to *Geotitles weekly*, the file supplies input to two specialized publications, and to a complete cumulated index in microfilm form, called *Geotitles repertorium*.

The classification system applied by Geosystems contains a relatively detailed breakdown of topics of direct interest to petroleum exploration (e.g. "exploration geology", "oil sands and shales", and "exploration management").

For additional information on Geo-Archive, contact: Mr. Graham Lea, Director, Geosystems, P.O. Box 1024, Westminster, London SW1P, England (phone 01-222-7305).

Petroleum Abstracts, University of Tulsa

In contrast with GEO-REF and Geo-Archive, *Petroleum abstracts* is a specialized bibliographical service, in this case restricted to worldwide technical literature and patents in petroleum-related fields. Topics covered of interest to exploration include geology, geophysics, geochemistry, and exploration. About 15,000 titles per year are cited in the entire file and coverage extends back to 1965. Retrospective searches of their magnetic tapes are offered to subscribing companies.

Serial publications related to their file include the familiar weekly *Petroleum abstracts*, a monthly subject index, the *Dual dictionary coordinate index to Petroleum abstracts*, and a thesaurus of keywords.

For additional information on *Petroleum abstracts*, contact: Dr. H.O. McLeod, Director, Information Services Dept, Univ of Tulsa, Tulsa, Okla. 74110 (phone 918/939-6351).

Canadian Index to Geoscience Data, Canadian Centre for Geoscience Data

The *Canadian index to geoscience data* is another specialized, computer-based, bibliographical service of particular interest in this context as it is the only one specializing in the geology of Canada. In addition to these geographical limits on its terms of reference, it differs significantly

from the services mentioned previously in that its objective is limited to identifying only those documents containing "data", that is, observations and measurements on the geology of Canada. The indexing of these data, however, is at a more detailed level than one would find in the general services.

The *Canadian index* began in late 1967 and has been developed as a component of the National System for data storage and retrieval in Canada; hence its orientation towards "data", rather than the total contents of geoscience documents. Another distinctive aspect of this unique service is the manner in which the index is compiled. Five provincial and four federal agencies provide indexing input to the Canadian Centre for Geoscience Data, which, in turn, compiles the file and distributes the products to the public. To date over 30,000 documents of all types have been indexed and, with additional cooperation from the provinces, nearly complete coverage of all government-produced and government-held documents is planned for 1973. About half of these are published documents, while the remainder are unpublished assessment reports and other open files maintained by provincial and federal agencies.

Services available from the *Canadian index* include the publication of general indexes to the major Canadian political divisions, both in hard-copy and microfiche form; the preparation of Special Indexes according to the specific needs of a client; and provision of the complete file in magnetic-tape form for in-house processing. The Canadian Centre for Geoscience Data is currently experimenting with the use of time-sharing computers to evaluate the feasibility of making the file available to the public through terminals connected with a public service bureau. By this means, any petroleum company could have immediate access for searching the *Canadian index*.

For additional information on the *Canadian index* to geoscience data, contact: Mr. B.A. McGee, Index Supervisor, Canadian Centre for Geoscience Data, 601 Booth St, Ottawa K1A 0E8, Canada (phone: 613/994-9780).

CAN/SDI Project, National Science Library and Geological Survey of Canada

The fifth computer-based service to which I wish to draw your attention is the CAN/SDI project. This acronym stands for "Canada/Selective Dissemination of Information", and it refers to a national computer-based, current-awareness service which alerts individual scientists to the existence of recently published papers in their specific fields of interest. Under the system, nine data bases (including the GEO-REF file described earlier) containing bibliographic data from about 15,000 journals and covering all fields of science and technology, are processed weekly or bi-weekly and matched against individual interest profiles (Brown, 1972).

The overall CAN/SDI service is provided by the National Science Library, but in the case of geology,

the Geological Survey of Canada is responsible for advising potential subscribers, for drawing up interest profiles, and for serving as search editor in the field of geology. The basic subscription rate of \$69.00 per year provides the subscriber with up to 60 terms for describing his or her current range of interests. These terms can be changed to meet new interests or to refine the search strategy. This list is then matched with terms recorded in the GEO-REF or other tapes and the titles of all "hits" are mailed to the subscriber each month.

For the total CAN/SDI system, which incidentally is the only national SDI service in the world, there are presently 936 individual subscribers receiving 225,000 citations per month or 2,700,000 per year (Brown, 1972). Eighty-six geologists are currently subscribing through the Geological Survey. Most of these are searching the GEO-REF tape, but many are also using others such as Chemical Titles, ISI, and INSPEC.

Further information on CAN/SDI is available from: Mrs. D.M. Sutherland, Head, Library Services, Geological Survey of Canada, 601 Booth St, Ottawa K1A 0E8, Canada (phone: 613/994-5325).

Planning for the Future

This brief review of available computer-based information services of interest to petroleum exploration should indicate to you that a number of valuable tools already exist and are available. At the same time, it is equally evident that much remains to be done in the future. There is obvious duplication of coverage and services while at the same time a great deal of literature is not included in any service; each system differs in its approach and methods, making it difficult to translate one into another; and users' needs for information services are poorly understood, so that the output and products offered frequently do not meet real needs. These and other problems are under active review by a large number of organizations at levels ranging from international to local. In recent years there have been an almost bewildering number of studies of scientific and technical information services, including six major studies in Canada alone during the past four years.

On this occasion I must limit my remarks on this activity to three projects of direct interest to Canadian petroleum exploration. At the highest level in Canada, the National Science Library has been given a federal directive to develop a national scientific and technical information (STI) system under general direction of the National Librarian. An Advisory Board for STI, restricted mainly to members from industry, has been appointed to direct this work. Practical results of this coordinated program will likely manifest themselves to the petroleum industry through services of the National Science Library, including CAN/SDI.

In the geological community, the National Advisory Committee on Research in the Geological Sciences has approved a recommendation of its Computer Applications Subcommittee to "examine the ways and

means available to systematically develop and implement an (STI) system for the dissemination of geological information in Canada". A report on its findings will be submitted to the National Advisory Committee in 1973 (Sharp, in press).

A somewhat similar study has been undertaken by the Geological Society of America through its Committee on Publications. The Society is reviewing its role and responsibilities in the dissemination of geological information, particularly with regard to providing an improved, modern bibliographical service to its members and the profession at large. A proposal from the Committee on Publications is expected to be made in March 1973, from which Canadian members of GSA, among others, can expect to benefit.

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- Sharp, D.A. (in press) *Subcommittee on computer applications*. In *National Advisory Committee on Research in the Geological Sciences. Twentieth annual report 1969-72* (Canada. Geological Survey. Paper 72-6).

GIS Newsletter

Editor: Robert McAfee, jr., American Society for Information Science, 1140 Connecticut Ave, N.W., Washington, D.C. 20036 (phone: 202/659-3644)

Assistant Editor: Amy Bumberg, Library, U.S. Geological Survey, Washington, D.C. 20242 (phone: 202/343-3864)

Title	Author/Editor	Date	Price	Remarks	Available from
<i>GIS Newsletter</i>	Robert McAfee, jr., editor	1966-	free to members; \$10 annual subscr. & news happenings in geoscience info field	issued 6 times/yr; reports on GIS activities & news happenings in geoscience info field	Editor, ASIS, 1140 Conn. Ave, N.W., Wash DC 20036
<i>Geologic Field Trip Guidebooks of North America; 2nd ed.</i>	GIS Guidebook & Ephemeral Materials Committee, comp.	1971	\$20	union list incorporating monographic titles & locations in 57 participating libraries; revision of 1968 ed.	Phil Wilson Publishing Co., Box 13187, Houston, Tex. 77019
<i>GIS Proceedings, Volume 1 (of 2nd Annual Meeting, 1967)</i>	-	1969	\$2	title: "Handling Geoscience Data and Information"	out of print
<i>GIS Proceedings, Volume 2 (of 6th Annual Meeting, 1971)</i>	Roy W. Graves, editor	1972	free to members; \$2.50 to non-members	title: "Toward the Development of a Geoscience Information System; a Symposium"	GIS Secty, c/o AGI, 2201 M St, N.W., Wash DC 20037
<i>GIS Proceedings, Volume 3 (of 7th Annual Meeting, 1972)</i>	Hartley K. Phinney, jr., editor	Spring 1973	free to members; \$5 to non-members	-	GIS Secty, c/o AGI, 2201 M St, N.W., Wash DC 20037
<i>Directory of Geoscience Libraries; U.S. and Canada</i>	Richard D. Walker, compiler	1968	\$2	lists 230 geoscience collections by State and Province	GIS Secty, c/o AGI, 2201 M St, N.W., Wash DC 20037
<i>A Buying List of 100 Good Geology Books for the High School Library</i>	Mark W. Pangborn, jr., compiler	1967	free	7-page leaflet co-pub. by NAGT; revised reprint pub. in <i>Journal of Geological Education</i> , Apr 1968, v.16, p.65-68	out of print; revised version due Summer 1973
<i>Librarians in Geoscience</i>	Mark W. Pangborn, jr.	Apr. 1967	free	1-page reprint from <i>Geotimes</i> ; includes list of selected accredited library schools	AGI, 2201 M St, N.W., Wash DC 20037
<i>Directory of GIS Members</i>	GIS	1966-	free to members	issued annually; includes geographic & institutional indexes	GIS Secty, c/o AGI, 2201 M St, N.W., Wash DC 20037
<i>Environmental Geology in the Pittsburgh area</i>	Richard D. Thompson, editor	1971	\$3	guidebook for a 1971 GSA Annual Meeting field trip	GIS Secty, c/o AGI, 2201 M St, N.W., Wash DC 20037
<i>Bibliography of Theses in Geology 1964</i>	Dederick C. Ward, III, comp. & ed.	1965	-	titles of theses in geology accepted by U.S. & Canadian universities & colleges; prepared with AGI assistance	AGI
1965-1966		1969	\$7.50	pub. in <i>Geoscience Abstracts</i> , Dec 1965	AGI
1967-1970		Spring 1973	?	255-page book pub. by AGI and GIS	AGI
1971-		July 1972-	-	GSA <i>Special Paper</i> no. 143	GSA, 3300 Penrose Pl, Boulder, Col. 80301
				in monthly GSA <i>Bibliography and Index of Geology</i>	GSA, 3300 Penrose Pl, Boulder, Col. 80301