

# STATE OF WYOMING

1976



## ANNUAL REPORT of the Geological Survey

July 1, 1975 through June 30, 1976

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## INTRODUCTION

The Wyoming Geological Survey is a State agency located on the University of Wyoming campus, established in 1933 and modified by the Legislature in 1957 and 1969 (Wyoming compiled statutes 9-264.1 to 9-264.10), and modified again in 1975. As designated by law, the Survey has eleven objectives and operates in an effort to provide information and public services concerning the geology and mineral resources of the State. The Survey functions under an Advisory Board as shown on the organizational chart (p. 2)

Since 1969 the activities of the Survey have steadily increased in order to assist with the orderly development of mineral activities in the State and with problems related to potentially impacted areas involving Wyoming's communities and people. In addition, the Survey's staff is now called upon frequently to act in an advisory capacity to State Legislators, Legislative committees, State agencies, and numerous other State and Federal commissions and councils. Furthermore, since the passage of the new land use and industrial plant siting legislation, the Survey's staff is also called upon to assist planning coordinators and officials in practically all of Wyoming's 23 counties. The Survey's principal objective is to supply the kinds of reports, maps, and data, that are needed in order to respond to these obligations as well as to thousands of other requests from the mineral industries and the general public.

Overall operation of the Survey can be summarized into three general categories as:

Services -- Compilation and continuous updating and maintenance of files and libraries of all published material, records, maps, and data relating to the surface and subsurface geology and mineral resources of the State; and distribution of this information upon request to county and state officials, state agencies, the minerals industries, research organizations, and the general public.

Investigations -- Through field investigations that contribute new geological information to the State concerning mineral resources, and other matters or problems that have a practical bearing on Wyoming's communities and people, and by conducting cooperative investigations with other state and federal agencies on problems of mutual concern or interest.

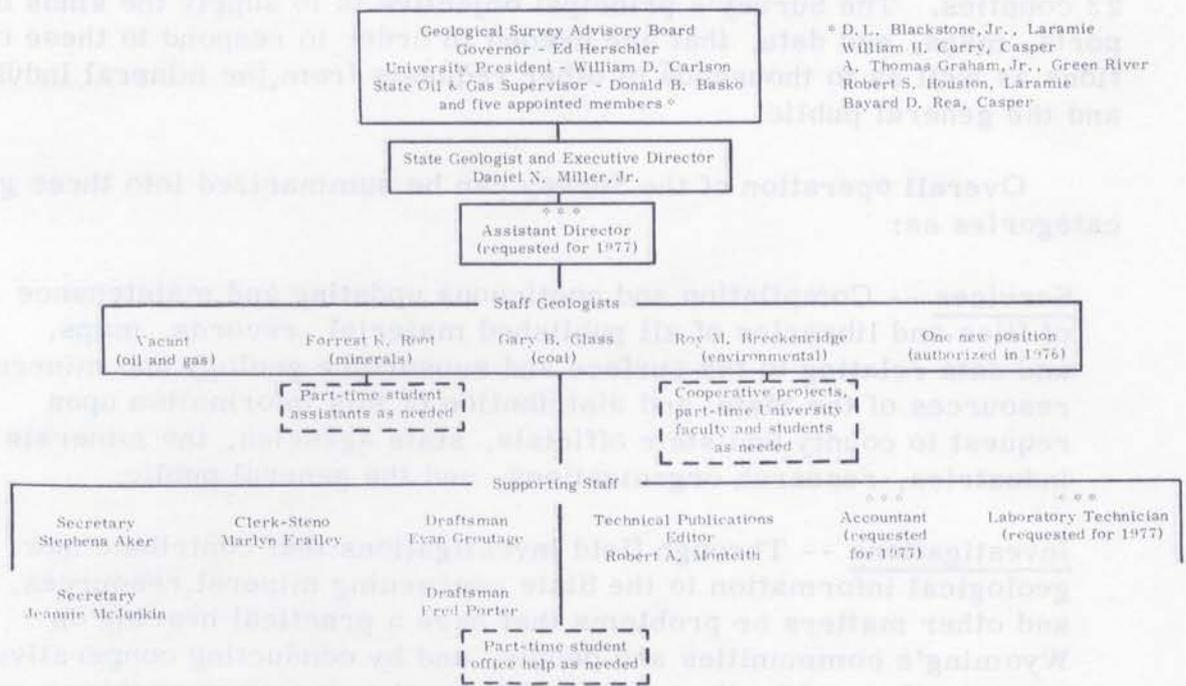
Publications -- By publishing timely and significant reports, maps, books, tables, graphs and charts, in an effort to communicate the results of the investigations to other agencies, the minerals industry, and the public.

## ORGANIZATION

The Geological Survey presently has a staff of twelve consisting of a director, five staff geologists, a technical publications editor, two draftsmen, and three secretaries or clerk-stenos. In addition, the Survey employs a varying number of part-time student help when necessary to assist with investigations and office activities.

The organizational chart on page 2 illustrates the administrative structure of the present staff, and the positions of three additional personnel that are urgently needed, but which were not authorized by the 1976 Legislature.

ORGANIZATIONAL CHART - THE GEOLOGICAL SURVEY OF WYOMING (1976)



\*\*\* Positions urgently needed and requested by the Survey, but rejected by the 1976 Legislature.

## MAJOR ACCOMPLISHMENTS BY PROGRAMS

During the past year the agency operated under four separate budget categories: Administration, Publications, Capital Expenditures, and Cooperative Programs.

### Administration (Budget 01)

The main thrust of the Survey's activity is to provide public service with emphasis on the distribution of information through the publication of reports and maps. The Survey attempts to provide timely and significant information regarding the major facets of Wyoming's geology and its relationship to mineral resources and environmental concerns as described in the following.

Oil and Gas Section (William G. Wendell) - Throughout the year the Oil and Gas Section continued to receive, classify and file substantial amounts of new subsurface information provided by the petroleum industry and directed through the Wyoming Oil & Gas Conservation Commission. All new discoveries are evaluated with respect to State mineral ownership and reported to the Commissioner of Public Lands. All logs, maps, field reports, and production data are filed and made available for public use. During the year the Section responded to approximately 250 telephone, letter or personal inquiries concerning petroleum and natural gas in Wyoming.

A new geologic map of Wyoming's Over-thrust Belt was prepared by Professor D. L. Blackstone, Jr., and the Oil and Gas Section that shows the location of all oil and gas tests and producing fields in portions of Uinta, Lincoln, Sublette and Teton counties.

In addition, the Section completed the Oil and Gas and Geology maps of Johnson County for the County Resource Series report.

Minerals Section (Forrest K. Root) - The Minerals Section functions as a principal source of information on Wyoming uranium, industrial minerals, and metal deposits for industry, other government bodies, and the general public. The section also supervises and conducts independent and cooperative investigations on the characteristics and distribution of mineral deposits of all kinds.

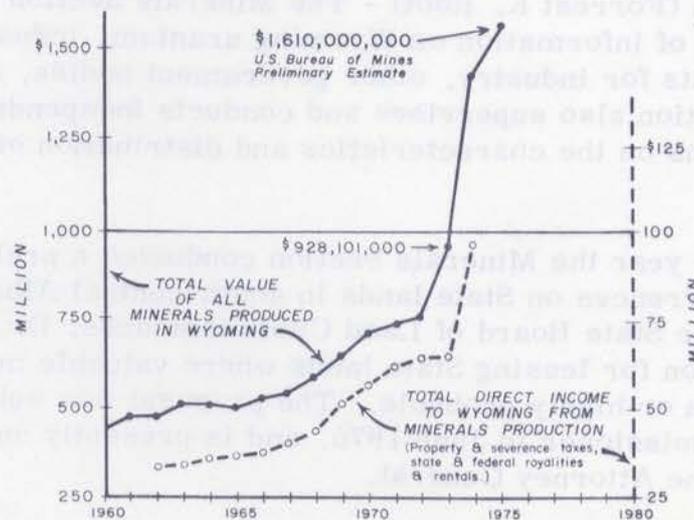
During the year the Minerals Section conducted a preliminary survey of diamond occurrences on State lands in south-central Albany County. At the request of the State Board of Land Commissioners, Dr. Root prepared a recommendation for leasing State lands where valuable mineral deposits are either known or highly probable. The proposal was submitted to the State Land Commissioner in June 1976, and is presently under review by that office and the Attorney General.

The Minerals Section has recommended, and the Survey is now sponsoring, in part, mapping and geochemical sampling projects by University graduate geology students in the Seminole area of Carbon County and the southern Big Horn Mountain area of Johnson County.

During the year the Section prepared the following documents or publications:

- a. Industrial minerals maps for Johnson and Sheridan counties.
- b. Projections of trona industry activity to 1990 as related to ad valorem and severance taxes. Prepared for the Legislative Services Office.
- c. Projections of trona industry activity to 1990 as related to impact problems. Prepared for the State Planning Office.
- d. Projections of uranium mining activity as related to impact problems. Prepared for the State Planning Office.
- e. Preliminary report to State Land Board on diamond-bearing kimberlites on State lands in Albany County.
- f. Program for competitive bonus-bid leasing of State lands with known mineral occurrences. Prepared for the State Land Commissioner.
- g. Jade in Wyoming (pamphlet).

The Section also responded to a great many telephone, letter and personal interview requests for information on mineral occurrences in Wyoming. The graph below provides a relative basis for comparison of overall mineral activity in the State.



The Section has also been involved in several federally financed cooperative field investigations described under the heading "Cooperative Programs".

Coal Section (Gary B. Glass) - The Coal Section responds to all inquiries on coal geology, coal mining, and other coal related matters directed to the Survey. In carrying out its duties the Coal Section conducts field investigations and laboratory analyses, and interprets and publishes information of all kinds for a wide variety of users.

During the year the Section responded to more than 600 telephone and letter inquiries, and was interviewed by 180 individuals seeking advice or information related to coal in Wyoming.

Mr. Glass presented twenty-one talks on coal related activities to industry, professional and academic research groups, and educational and governmental organizations. In addition, the Section completed the following documents and publications:

- a. Analysis and Measured Sections of 54 Wyoming Coal Samples (Report of Investigations No. 11)
- b. Coal Mining in the Bighorn Coal Basin (WGA 1975)
- c. Review of the Western Coal Boom in Wyoming and Montana (Reprint)
- d. Wyoming Coal and its Uses (Information Circular)
- e. State Owned Coal Lands, 1976 (Information Circular)
- f. Wyoming Coal Deposits (Coal Symposium Transactions)
- g. Wyoming Coal Directory, 1976 (Information Circular)
- h. Completed maps on the coal geology of Johnson County for the County Resource Series report.

The Coal Section has also been engaged in a number of cooperative investigations with federal agencies that are described on the following pages under the heading "Cooperative Programs".

Environmental Section (Roy M. Breckenridge) - This Section has responsibility for providing all geological information relating to geohydrology, remotely sensed information and aerial photography, geomorphology, environmental geology, construction materials, and geothermal resources. Responding to hundreds of informal requests (letters, telephone calls and office visits) is routine everyday business in this Section. In addition, Dr. Breckenridge

also serves on several State committees and participates with various groups on short-term study projects.

During the year the State Planning Office initiated an orthophoto mapping agreement with the U. S. Geological Survey. Much of the planning and preliminary work has been done by Dr. Breckenridge and Professor Ron Marrs of the University of Wyoming.

The Section compiled a tabulated card index system for all available earthquake related (seismic) data for Wyoming during the year. They have also been developing, along with the Industrial Siting Administration, a model impact statement form that will be completed in 1976. The Section completed a bibliographic reference list of available information on hot springs in Wyoming. A hot springs sampling and analysis program is now underway. In addition the Section is compiling a geologic hazards map of the State that will define active faults, landslides, flood plains and other natural phenomena of importance to people, communities, counties, and a number of State agencies.

During 1975 the Environmental Section also completed several maps for the Johnson County Resource Report, and published "Geothermal Resources, Present and Future Demand for Power and Legislation in the State of Wyoming".

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The following table shows an approximation of each Section's man-hour time allocations to major categories of work.

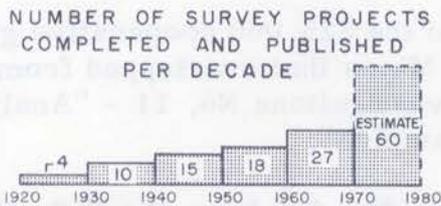
Major Activity Time Allocation Table of each Section

	<u>Oil &amp; Gas</u>	<u>Minerals</u>	<u>Coal</u>	<u>Environmental</u>
Public Service	55%	50%	20%	45%
State Agency Services	-	20	5	25
Federal Agency Services	-	5	5	5
Field and Laboratory Project Investigations	15	10	12	10
Data Organization	25	5	5	10
Report Writing and Editorial Reviews	-	10	43	4
Administration	5	-	10	1

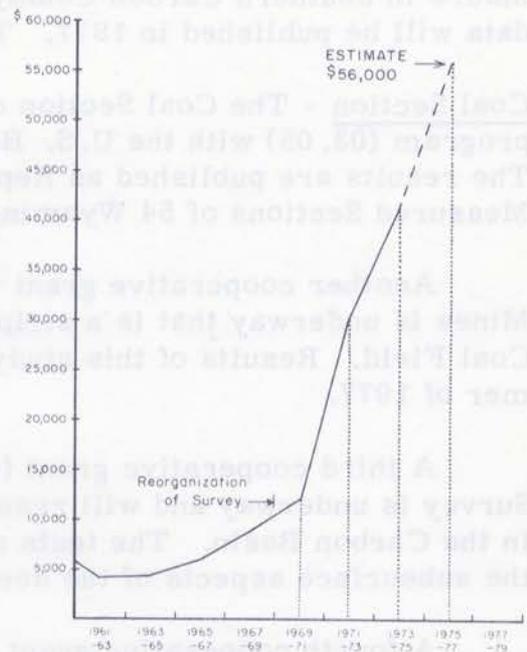
It is evident from the Time Allocation Table that the major accomplishment of the Survey are services to the public and industry, and to State and Federal agencies.

### Publications (Budget 02)

The Publications Section of the Survey consists of Technical Writer-Editor Robert A. Monteith, and one part-time clerk-typist. Nineteen separate circulars, reports and maps were published during the year that exhausted the available funds. The following graphs illustrate the productivity and income derived from the sale of publications.



**CONTENT OF SURVEY PUBLICATIONS (1911 TO 1976)**



**BIENNIAL INCOME FROM SURVEY PUBLICATIONS DEPOSITED IN GENERAL FUND**

In addition to the publications listed in each of the previous Sections, the Survey also published "Caves of Wyoming", and a number of pamphlets and circulars on general interest subjects for the public. Copies of all publications are distributed free to county and public libraries throughout the State.

### Capital Expenditures (Budget 70)

Excavation for the new Wyoming Geological Survey Building began on the University of Wyoming campus in June 1975. The building was completed in August 1976 by Spiegelberg Lumber and Building Company of Laramie, general contractor. Survey staff will have occupancy of the building in September 1976.

Cornerstone and dedication ceremonies are scheduled for September 11, 1976.

Cooperative Programs (Budget 03.05, 03.07,  
03.09, 03.10)

During the year the Survey completed several existing cooperative investigations and initiated new ones as follows:

Oil and Gas Section - None

Minerals Section - The Minerals Section carried on the existing cooperative contracts (03.08 - 03.10) with the U.S. Geological Survey and the University Department of Geology in an effort to evaluate the uranium and gold content in Precambrian conglomerates of the Medicine Bow Range and the Sierra Madre in southern Carbon County. Results thus far are encouraging and the data will be published in 1977. The total grant for the year was \$11,000.

Coal Section - The Coal Section completed the \$25,000 cooperative grant program (03.05) with the U.S. Bureau of Mines that overlapped from 1974. The results are published as Report of Investigations No. 11 - "Analyses and Measured Sections of 54 Wyoming Coal Samples".

Another cooperative grant (03.07) for \$15,000 from the U.S. Bureau of Mines is underway that is a strippable coal resource evaluation of the Hanna Coal Field. Results of this study will be published during the spring or summer of 1977.

A third cooperative grant (03.09) for \$62,000 with the U.S. Geological Survey is underway and will result in the drilling of two 1000-foot core tests in the Carbon Basin. The tests are designed to provide new information on the subsurface aspects of the deep coal resources in that area.

A fourth cooperative grant for \$14,000 financed by the U.S. Bureau of Land Management is being conducted by the University of Wyoming Department of Geology with the Survey as cooperator. This grant is an experimental application of computer technology toward estimation of coal reserves. The Survey is contributing man power and time to this project, but receives no funds.

PROBLEM AREAS AND RECOMMENDATIONS

The Survey has only two serious problems at this time; both involve authorization to hire additional support personnel in the immediate future.

Three additional full-time staff members are needed as described in the 1976-78 Biennium Budget Request (p. 5), as follows:

- a. An Assistant Director to be hired in July 1, 1977, to supervise and manage priority work schedules of all Survey personnel, to organize

and execute State-Federal cooperative contracts, and to represent the Director in his absence. The position requires scientific knowledge as well as administrative capability.

- b. A Laboratory Technologist (Geology) to be hired July 1, 1977, to handle all analytical work on rocks, minerals and ores as required for geological investigations; and to develop permanent files and records that will assist in the interpretation of mineral deposits and geological hazards. Many of the State-Federal cooperative programs require this type of analytical information. A new laboratory and office are available for this position.
- c. Accounting Technician II to be hired in July 1977, to manage all of the agency's accounting, including all cooperative grants from federal agencies. Responsibilities include payroll, vouchering, contractual payments, purchase of supplies and equipment, and complete liaison with the DAFC Budget Division.

Recommendation: That the 1977 Session of the Legislature authorize three additional permanent positions for the Wyoming Geological Survey as described, and appropriate \$53,596 to cover total personal services for 1977-78.

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The second major concern of the Survey is the need to hire three additional part-time student assistants to help the professional staff. The work load on the geological staff continues to increase due to the influx of new geological data and to the expanded demands for services to the public, to State and Federal agencies and to community and county administrators. This approach would allow the staff geologists to have one part-time student assistant who could handle many of the requests from the public, the preparation of routine statistical reports, and preliminary library research.

Recommendation: That an additional \$8500 be appropriated by the Legislature in 1977-78 to pay the part-time salaries of three additional graduate students in Geology in order to assist the professional staff with data organization and routine service functions.

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In conclusion, the work load and service role of the Wyoming Geological Survey continues to expand because of increased mineral activity in the State. The Survey staff are functioning in a productive manner providing the services required by law, and generating new data and information important to the State's future.