

State of Florida
Florida State Board of Conservation

GEORGE VATHIS, Supervisor



EIGHTH BIENNIAL REPORT
of the
FLORIDA GEOLOGICAL SURVEY

Covering Period
January 1, 1947 through December 31, 1948

HERMAN GUNTER
Director and State Geologist

TALLAHASSEE, FLORIDA
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LETTER OF TRANSMITTAL

Tallahassee, Florida

March 1, 1949

Mr. George Vathis, Supervisor
Florida State Board of Conservation
Tallahassee, Florida

Sir:

Transmitted herewith is the biennial report of the Florida Geological Survey, a Division of the Florida State Board of Conservation. This is the biennial report of the Survey since it became a part of the Department of Conservation by Legislative Act in 1933. You will find in this report a brief review of the activities during the period covered, a statement of the proposed program for the immediate future, summaries of the mineral production for 1946-1947 and the financial statement. The report covers the calendar years 1947-1948. The progress of the Survey has been satisfactory on the whole but we have been handicapped by our inability to secure trained personnel largely because of economic conditions with which the Survey was not prepared to cope. Should the budget for the incoming biennium as approved by the Budget Commission be approved and made available by the Legislature of 1949 the Survey will find itself in much better position for adding to its staff.

Let me add my expression of appreciation of the interest you have shown in the work of this Division and the support you have already given it.

Respectfully submitted,

HERMAN GUNTER, *Director*

Eighth Biennial Report *of the* Florida Geological Survey

INTRODUCTION

SURVEY QUARTERS

During the biennium 1947-1948 the State made much progress in providing more space for a number of its large, crowded and fast growing departments. The Capitol Center Program under consideration for some years was brought closer to realization by the adoption of an official long-ranged plan and the construction of the first three buildings—Caldwell Building caring for the Industrial Commission; the Holland Building providing much needed accommodations for the State Road Department, and the Supreme Court Building, the imposing, dignified gem of the three, in which the Supreme Court of Florida will deliberate. The space vacated by each of these State departments will be taken over by other official agencies that have long been over-crowded. Although this will provide at least immediate relief for certain departments others will remain in as crowded quarters as ever. Among those unaffected so far is the Florida Geological Survey although the ultimate plan includes a building which will care for the Geological Survey and related natural resource departments. In the meantime, however, the Florida State University is continuing to provide convenient office accommodations on the University Campus in the East Lower Dining Hall where the Survey has been located since December, 1939. The Survey itself, however, is growing not only in personnel but also in expanded activities and acquisitions. This is especially noticeable in the significant additions to the already imposing file of well samples, see figure 1. It has therefore been necessary to remove this file of samples from almost 2,000 wells along with some other collections, to a storage space made available through the completion of a quonset hut on University property adjacent to the campus. Even with this relief the Survey needs additional room. The Florida

Geological Survey is not an official part of the University and is housed on the campus only through the courtesy of the Board of Control and the officials of the University. With the phenominally rapid growth and expansion of the University the Survey is fortunate to occupy its present quarters. It is hoped that the Survey can continue to contribute to the University program by expanding its museum and research facilities. This would require adequate housing and in our Seventh Biennial Report, page 6-7, general data on the nature of the building needed by the Survey, are given.

WELL SAMPLE LIBRARY

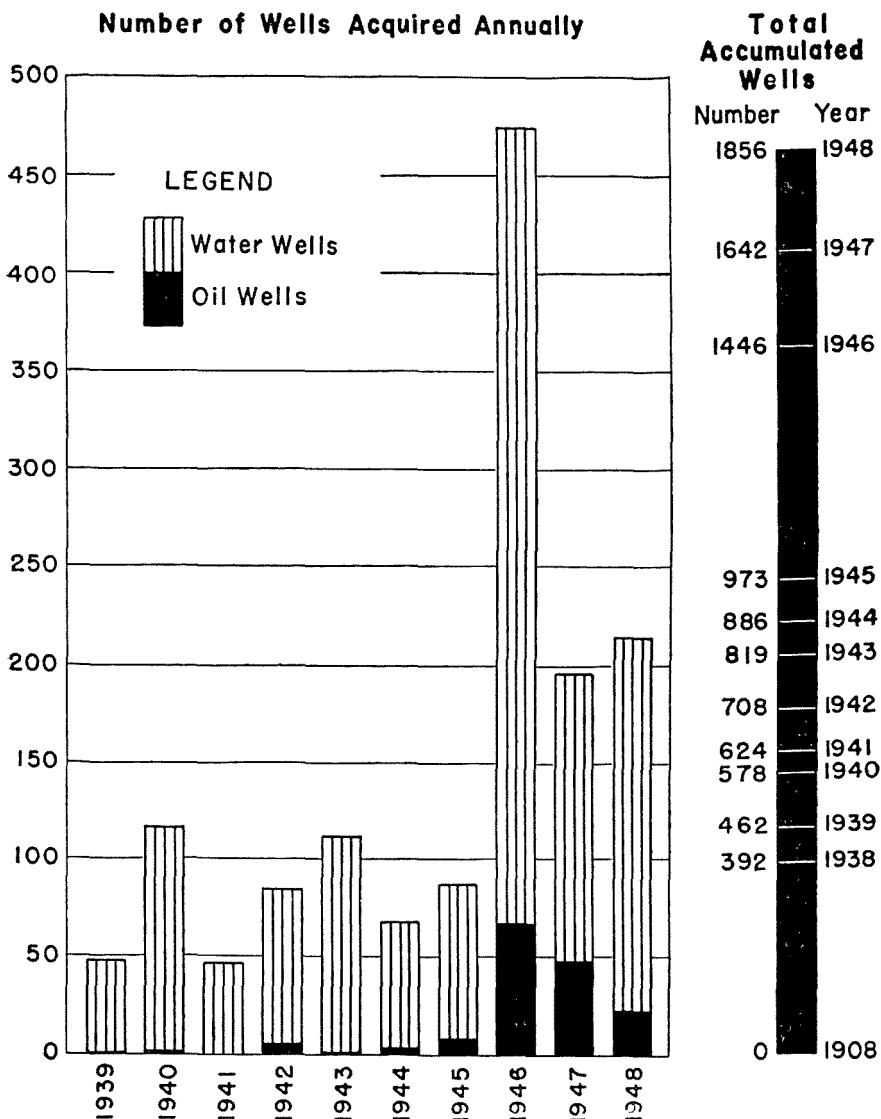


Figure 1—Graph Illustrating Growth of Well Sample Library.

STAFF — 1947-1948

FULL TIME STAFF:

Herman Gunter, D.Sc(Hon.), Director
Robert O. Vernon, Ph.D., Geologist
James L. Calver, Ph.D., Geologist
Hans G. Naegeli, Ph.D., Paleontologist
J. Clarence Simpson, Supervisor of Laboratory.
Harold T. Chittum, Jr., Assistant Geologist (Employed Nov. 1, 1948)
Corinne Little, Secretary
Mary W. Blount, Secretary
Jean Neel, Secretary
Lily Moore, Librarian
John McBride, Janitor

RESEARCH CONSULTANTS:

W. Storrs Cole, Ph.D., Micropaleontologist, Special Research
Alfred G. Fischer, Geologist, Special research in geology and invertebrate paleontology
Wayne E. Moore, Geologist, Research—Geology of Jackson County
Thomas Lins and L. Neal FitzSimons, Assistants to Moore in Jackson County Research

PART TIME STAFF:

Edwin Andrews, Draftsman's Assistant
William C. Henry, Preparator in Micropaleontology
Bernard Eaton, Assistant in Laboratory
Robert Hart, Assistant in Laboratory
Walton Jones, Assistant in Laboratory
DeWitt F. Miller, Jr., Assistant in Laboratory
Jack Wells, Assistant in Laboratory

ACTIVITIES OF THE GEOLOGICAL SURVEY

January 1. 1947-December 31, 1948

The biennium here considered has been one of constant activity. There is a growing interest in the industrial possibilities of Florida and the Survey is endeavoring in every possible way to make known the potentialities of our mineral resources. There seems to be a general consideration of relocation and decentralization of industry from the highly industrialized centers to those areas offering inducements of underdeveloped natural resources and related advantages of

climate, labor and transportation. This is judged from the number of inquiries for information on Florida's mineral raw materials, to such inquiries the Survey gives prompt and full reply by letter, often supplemented by printed reports. Personal calls, too, are made and these take considerable attention and time of the Survey staff. Requests for examination of mineral specimens sent in by citizens of the State receive merited consideration and often the results of such tests suggest that it is advisable to have the properties from which the samples came further examined. In the progress of its routine field work members of the Survey staff examine such deposits and recommend either further prospecting or otherwise advise the land owner on its possibilities of economic development. This service of the Survey has proved advantageous to the citizens.

The increased growth of the cities and towns and the development of the rural areas has created a tremendous demand for data on ground water. With the well organized and increasing file of information obtained through samples from wells in many portions of Florida, the Survey is finding itself in a constantly better position to give helpful and dependable service about this important resource.

INVESTIGATIONS COMPLETED AND IN PROGRESS

COUNTY REPORTS

In 1942 the Survey published Bulletin No. 21 dealing with a detailed geological and structural study of Washington and Holmes counties. It has proved to be a very acceptable and satisfactory form of report and it has been decided to continue the county series of bulletins.

Levy and Citrus Counties: The field work for a report on these two counties has been completed by Dr. R. O. Vernon and the manuscript and accompanying maps are in preparation. It is expected that the report will be ready for printing during the summer of 1949.

As an indication of the completeness and thoroughness of this report there will be included a number of special papers dealing with particular phases of the geology and paleontology

of the area. Among these is a paper on the Ostracoda by Dr. Henry V. Howe, Dean, Arts and Sciences, Louisiana State University, Baton Rouge, and Mr. Alfred G. Fischer, now with the Kansas Geological Survey, will contribute two papers "The Echinoid Fauna of the Eocene Withlacoochee Limestone" and the "Petrology of the Eocene Limestones in and around the Citrus-Levy County Area, Florida."

Jackson County: There is in preparation a report on the geology and mineral resources of Jackson County. The major portion of the field work has been completed by Wayne E. Moore, a graduate student of Cornell University. The manuscript is in preparation and this together with the accompanying maps should be completed this summer.

Dr. James L. Calver has completed very satisfactorily the cumbersome task of abstracting factual data from two unpublished manuscripts which the Survey has had in file for some time. One of these deals with Florida Kaolins and was written by Frank Westendick; the other with Clays of Northern Florida was prepared by Dr. James H. C. Martens. Both Mr. Westendick and Dr. Martens are former employees of the Survey and these data were prepared while they were so employed some years ago. Mr. Westendick prepared his manuscript while employed by the U. S. Bureau of Mines in a co-operative agreement with the Florida Survey. The abstracted factual data from these two manuscripts are being mimeographed and published as Information Circular No. 2. These data should benefit all who may be interested in the locations and characteristics of the high-grade, white-firing kaolins of Florida and the common clays of northern Florida.

Progress is likewise being made on a report dealing with the Mineral Resources of Florida which Dr. Calver will complete in the near future. There is an ever increasing demand for information about the mineral resources of Florida both the developed and the potential and this report will fill the requests for this character of information.

With the continually increasing number of samples that the Survey receives from wells drilled in Florida we are experiencing difficulty in keeping current with their study. It is

hoped, however, that Dr. H. G. Naegeli can prepare some of the results of his studies for publication. Even with progress in geophysics and with the increased dependence placed on electric logs the paleontological determinations are indispensable in analyzing and correlating the rock strata of new fields such as Florida. It is therefore of much practical help to have such data available for distribution.

PUBLICATIONS

During the biennium the following publications have been prepared by members of the department and by members of the U. S. Geological Survey and the U. S. Bureau of Mines in cooperation with the Survey:

Seventh Biennial Report, calendar years 1945-1946, including mineral production statistics for 1944-1945, 1947, 24 pp.

Bulletin 31, Springs of Florida, 1947, 196 pp., 1 pl., 38 figs., 4 tables.

Bulletin 32, Elevations in Florida, 1948, 1158 pp., 2 figs. \$1.50.

Report of Investigations No. 6, Geology and Ground Waters of the Fort Lauderdale Area, Florida, 1948, 42 pp., 12 pls.

Information Circular No. 1, Exploration for Oil and Gas in Florida, 1948, 68 pp., 2 figs., 2 tables.

Information Circular No. 1—Revised, Exploration for Oil and Gas in Florida, 1949, 106 pp., Frontispiece, 2 figs., 2 tablets. \$1.00.

Information Circular No. 2, Florida Kaolins and Clays, 1949, 59 pp., 2 figs. \$.50.

Report of Investigation 4208 (U. S. Bureau of Mines) March 1948, Titanium Minerals in Trail Ridge, Fla. 1948, 21 pp., 19 figs.

A new policy relating to the distribution of the publications of the Survey has been established. For many years there was no charge for any reports issued. Then a small postage and handling charge was instituted. In recent years, however, there has been a constant rise in printing costs and this together with the generally decreasing value of the dollar impelled the Survey to ask the opinion of the Attorney General as to the advisability of making a charge that would partially cover the cost of printing. This proposed policy was approved and a charge is now attached to each new publication based upon the actual cost of printing. The Survey has not applied this ruling retroactively.

PUBLICATIONS IN PREPARATION

A bulletin relating to the geology, structure, stratigraphy and mineral resources of Levy and Citrus counties is approaching completion. The broadening of the scope of the study to areas surrounding these counties, which as the study progressed indicated was essential to a more complete interpretation of problems within the two counties, delayed the completion of the report but it is certain that the final report will be the more satisfactory. It is planned that the publication will appear during the summer.

Progress is also being made on a bulletin dealing with the mineral resources and industries of Florida. There is a general and increasing interest in the mineral resources of Florida and the opportunities that these offer for development and this report should therefore be in demand.

Also in preparation is a detailed county report dealing with Jackson County. This will contain data on the geology, structure and stratigraphy of the county as well as data on the mineral resources and recommendations for their development.

In cooperation with the U. S. Geological Survey there will be issued bulletins on the water resources of the various localities which have been investigated. This work will include a general report on the lakes of Florida, their areal extent, depths, biologic character and the recreational possibilities they offer, as well as general reports covering ground water investigations.

COOPERATION WITH OTHER AGENCIES

The Geological Survey continued its cooperation with federal bureaus, various state departments, municipalities, industries and individuals. In many instances this cooperative program was expanded and extended during the biennium. This mutual exchange of information has added much data to the Survey files, which make it possible for the Survey to render more widespread service and to further the utilization of the State's mineral resources.

United States Geological Survey: Cooperation with the U. S. Geological Survey began early after the Florida Survey was

created but since 1930 it has continued on a more substantial scale without interruption, although at times contributions from the State were much reduced. This cooperation has been mainly in the field of water resources although two volumes on the geology of Florida have been published by the Florida Survey, the texts of which were prepared by members of the U. S. Geological Survey staff. This cooperation has proved most helpful since it furnishes scientifically trained personnel and the equipment needed for the particular investigation, thus saving the State the expense of a large staff and special equipment.

Cooperation is maintained on the basis of equal expenditure of funds, the amount allotted by the Florida Geological Survey being matched by the U. S. Geological Survey. The investigations made are under the supervision of the State Geologist and the Director of the U. S. Geological Survey. During the years 1947-1948 the funds apportioned by Florida to the U. S. Geological Survey for Water Resources Investigations were as follows:

January 1, 1947 to June 30, 1947	
Ground Water	\$12,500.00
Surface Water	1,500.00
Quality of Water	250.00
July 1, 1947 to June 30, 1948	
Ground Water	\$25,000.00
Allocated by Budget Commission from Chapter 24283, Laws of Florida, 1947	
Surface Water	2,500.00
Quality of Water	500.00
July 1, 1948 to December 31, 1948	
Ground Water	7,750.00
From Chapter 24283, Laws of Florida, 1947	
Ground Water	4,000.00
From Florida Geological Survey appropriation	
Surface Water	1,250.00
Quality of Water	250.00

CURRENT APPROPRIATION

July 1, 1947-June 30, 1949

The appropriation under which the Survey is currently operating for the biennium July 1, 1947 to June 30, 1949 is:

	July 1, 1947 to June 30, 1948	July 1, 1948 to June 30, 1949
Salaries	\$50,200.00	\$50,200.00
Expenses	29,800.00	29,800.00
	\$80,000.00	\$80,000.00

The previous biennium appropriation was \$60,825.00 annually, the current appropriation therefore represented an increase of about 30 per cent. This increase was helpful in promoting the work of the Survey but did not include money budgeted to permit undertaking the contemplated expanded ground water investigations. Unless some other financial means were found this important work which had been in progress for numbers of years would have been either suspended or seriously hampered. Consequently, a direct appeal was made to the Budget Commission with the result that \$25,000.00 was allocated from an appropriation under Chapter 24283, Laws of Florida, 1947, creating a Division of Water Survey and Research under the supervision of the State Board of Conservation. This gave needed impetus to the ground water investigation program for the fiscal year July 1, 1947-June 30, 1948 and allowed not only the continuation of the work but also furnished funds to add needed equipment.

The Division of Water Survey and Research was established on August 6, 1947, by the State Board of Conservation. In activating this Division the appropriation for its maintenance was utilized. As a consequence, during the fiscal year beginning July 1, 1948, the full allotment of \$25,000 could not be continued. Recognizing the close relation of the two divisions—Water Survey and Research and Geological Survey—and the desire not to overlap in its functions, it was agreed that the Water Survey and Research would furnish \$15,500 and the Geological Survey \$8,000 from its operating fund, thus making a total of \$23,500 for the fiscal year 1948-1949, a reduction of \$1,500 from the previous year's allotment. It is planned to restore that reduction in another biennium through an appropriation for the Geological Survey.

Probably no phase of the ground-water investigations in cooperation with the Ground Water Branch of U. S. Geological Survey is more important than the program of observation of water levels in wells. Water-level records serve to indicate the extent to which the ground-water reservoirs are being recharged by rainfall in areas known as "recharge areas," and the extent to which they are depleted by heavy pumping, or, as in southern Florida, by the operation of drainage canals. In coastal areas, where ground water is subject to the en-

croachment of sea water, records of water levels are especially needed to indicate whether the hydraulic head of fresh water is sufficient to balance the salt water and thus block the entrance of salt water into the aquifers.

In view of the value of water-level records, a systematic program of observations was begun in 1939 and has gradually expanded as funds have permitted. At the end of 1948, a total of 605 wells were under regular observation. Of this total, 527 wells were being visited at intervals ranging from one each week to once in 6 weeks from direct observation of the water levels. Seventy-eight of the total were equipped with automatic water-stage recorders which gave a continuous record of the water level. The distribution of these recorders over the State is shown on the map, Figure 2 on page 16. Also shown are the proposed locations of 26 additional recorders which were ordered on June 3, 1948, and which will be delivered in March, 1949. Not shown are the 527 wells that are observed directly.

In southern Florida, where the problem of salt-water encroachment is in some places very critical, analyses of ground water for salt content are necessary. In conjunction with water-level observations, periodic water sampling from 336 selected wells is done. Where the rate of movement of sea water into the aquifers is known to be comparatively slow, the sampling interval is semi-annual or annual; where the rate of movement is more rapid the sampling is done monthly. At times, in some areas, when the rate of movement is especially rapid, bi-weekly sampling is done. A total of 12,113 analyses of ground water for salt content were made during the biennium.

The ground-water program includes also investigations of the geology and ground water of the State progressively by counties. These investigations range in duration from a few months to several years, depending on the nature of the problems. Where cities and counties have special problems requiring work that is too detailed or too extensive to be included in the program, the interested cities and counties bear part of the cost of the work. As the investigations are completed, reports giving the results are published by the Florida Geological Survey as part of the planned series of geological bulletins which will ultimately cover the entire State.

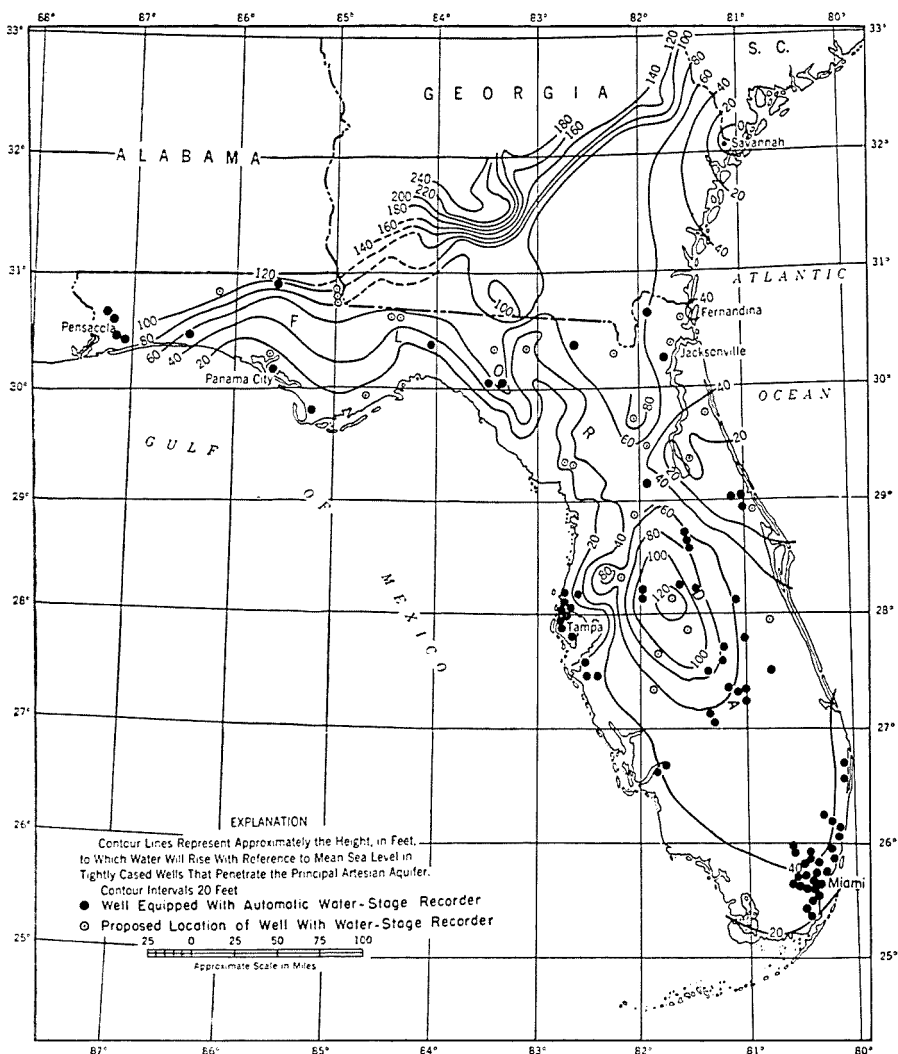


Figure 2—Map Representing The Piezometric Surface in Florida Showing Locations of Wells Equipped with Automatic Water-Stage Recorders.

The surface water program has consisted largely of a continuation of the collection of flow and stage data on Florida springs with emphasis on those where previously obtained records indicated possible changing trends. Florida Geological Survey Bulletin 31 has been used as a basis for this further study. A start has been made on a collection of depth data for the lakes of Florida which will supplement the lake stage information already obtained. At the end of 1948 122 gaging stations were being maintained on 86 rivers, canals, creeks and springs. In addition 74 stations for recording stage, only, were being operated in 46 additional surface water bodies.

Records of water levels in wells and stream-gaging data are published annually in a series of U. S. Geological Survey Water-Supply Papers. These papers may be purchased for a nominal price from the Superintendent of Documents, Washington, D. C.

Division of Water Survey and Research: The Division of Water Survey and Research was created by Chapter 24283, Laws of Florida, 1947, as a division of the State Board of Conservation. On August 6, 1947, Colonel A. G. Matthews was appointed Chief Engineer and cooperation with the Geological Survey was promptly established. Data in the files of the Geological Survey were made available to the Chief Engineer and these have proved most helpful in assisting him to assemble vital information on water resources. The Division has been very active and has published its first annual report for the year ending June 30, 1948, and there has also appeared a comprehensive compilation of rainfall data—Water Survey and Research Paper No. 1—"Observed Rainfall in Florida, Monthly Totals from Beginning of Records to 31 Dec. 1947." Accompanying this large volume is a series of 31 index maps showing the geographic locations of the various rainfall stations. This represents a tremendous amount of very exhaustive search and care in assembling and preparation. The volume will prove a most satisfactory, useful and convenient reference for Florida rainfall information.

It was from the appropriation for the Division of Water Survey and Research that the Geological Survey received \$25,000 during the fiscal year 1947-1948 and \$15,500 during

the fiscal year 1948-1949. This financial assistance made it possible for the Survey to continue and to expand its ground water investigations in cooperation with the U. S. Geological Survey for otherwise this work would have been seriously curtailed or suspended. Throughout its history the Florida Survey has given much attention to the ground waters of the State and has accumulated facts and data upon which our knowledge of the occurrence of this great natural resource is based. Little data relating to the surface water supplies have been assembled, and the Water Survey is currently undertaking this study. There will be no duplication of effort by the two divisions for whatever the Geological Survey accumulates on ground water will be supplemental and additional to that accumulated by the Water Survey and Research on surface waters, the two divisions cooperating with each other to the mutual advantage of both and to the citizens of the State.

United States Bureau of Mines and Bureau of Census: Data on mineral production are gathered by these agencies and the assembled and compiled information, together with the names and addresses of the producers, is sent to the Florida Survey at a great saving in clerical expense. In the event of any delinquents the Florida Survey makes contacts in an effort to get complete statistics. For a summary of mineral production in Florida for 1946 and 1947 and a graph showing the production for the past ten years see pages 27-28 and Figure 3.

The Bureau of Mines, Tuscaloosa Division, Mining Branch, has been especially cooperative. This is the Southern Experiment Station of the Bureau of Mines supervising development in Alabama, Florida, Louisiana and Mississippi. The Florida Survey in applying its knowledge of the history of the geological development of the State concluded that inasmuch as the separation of ilmenite, rutile and zircon from the sands of quiescent or stabilized dune areas east of Jacksonville had proven commercially feasible that a good area for further prospecting would be the Trail Ridge section running from just east of Macclenny, Baker County southerly through the central part of the Peninsula and merging into the well known Lake Region physiographic area and finally losing its identity in southern Florida by joining the flatwoods bordering the prairies of the Everglades. This was suggested to Mr. J. R.

Thoenen, Chief of the Tuscaloosa Branch, as a consequence of which an investigation was started which resulted in the discovery of commercial deposits of these minerals in the vicinity of Starke, Bradford County. One paper—Report of Investigation 4208, published in March 1948, sets forth the details of these explorations. There is now, almost complete, a plant for the removal of these minerals by the duPont interests, located at Camp Blanding. It is expected that operations will begin early in 1949. This splendid cooperation upon the part of the Tuscaloosa Branch of the Bureau of Mines resulting in accelerated development of the titanium mineral industry in Florida deserves merited commendation and thanks of the Florida Survey and appreciation from the citizens of the State.

University of Florida Engineering and Industrial Experiment Station: Cooperation has been maintained with the University of Florida in assisting the development of our clay resources. This has proved mutually advantageous and it is planned to enlarge this cooperation so as to include other raw mineral resources, taking advantage of the opportunities of research now made possible within the State through such cooperation with the Engineering and Industrial Experiment Station.

Florida State University: The Survey has reciprocated in every possible way the courtesies shown us by the officials of the Florida State University. During the past year the course, Introductory Geology, was taught by members of this Department. Student groups, as are all those who visit with us, are welcomed and museum studies are encouraged.

Florida State Board of Health: During the biennium cooperation with the Board of Health has been found mutually advantageous, especially in the field of ground water contamination problems. The Survey has been helpful in giving the Board of Health information on the location and other data on water wells in different parts of the State and in assisting in certain areas that have given trouble in contamination.

Florida State Road Department: This state department has been very helpful in supplying data on bench marks that have been established in connection with Florida's road system; also in giving data on the character of the subsurface

as determined by borings for bridge foundations and approaches and in supplying road profile data.

Florida Forestry and Park Service: Cooperation has been maintained especially in the matter of assisting in periodic inspections of cavern roofs and in water supply development in some park site areas. A short paper on the geology of the Marianna State Park area was prepared by R. O. Vernon for the Park Service. This paper is available through the Park Service and copies are made available to guests at the Marianna State Park.

State Chemist-Florida Department of Agriculture: The Survey is not equipped for making chemical analyses and the State Chemist has courteously obliged in making various analyses of soils, mineral specimens and bituminous materials. The cooperation has been very helpful in determining the exact character of many samples sent in for examination.

BUDGET REQUESTED

For the biennium beginning July 1, 1949, to June 30, 1951, the following budget has been requested:

	July 1, 1949 to June 30, 1950	July 1, 1950 to June 30, 1951
Salaries	\$ 78,500	\$ 78,500
Necessary and Regular Expense	90,500	90,500
	\$169,000	\$169,000

The Survey has experienced the most active biennium since its establishment. While this has been brought about by the interest in the potentialities of Florida as an oil producing State, it is also a reflection of increased interest and development of our mineral industries. The record total mineral production for 1947 indicates this without argument. This has all brought about a very decided increase of demands on the Survey for information and data that have accumulated through the years. The many oil company representatives, geologists, landmen and geophysical crews, have made much of the data available through the Survey. Furthermore the Survey has rendered directly, and through cooperation with the U. S. Geological Survey, much help to different municipalities, corporations and individuals, expressing concern over the

adequacy of our water supplies and their proper development. In every instance the Survey has rendered beneficial service. In order that we may more adequately take care of the additional demands for professional and technical help we have prepared the budget above, which is most conservative. With the additional funds requested made available, it is certain that more effective service can and will be rendered.

OIL PROSPECTING

The Seventh Biennial Report contains a summary of oil exploration activities to March 1947. The intervening two years has witnessed steady exploration progress although no new fields have been discovered. In the Sunniland Field, Collier County, however, five additional producing wells have been brought in, thus totalling nine producing wells in Florida, six of which are flowing and three are pumping. The latest producer was brought in March 11, 1949, and tests were in progress at the time of preparation of this report. This is the Lee Tidewater Cypress Lumber Company "B" No. 2 well of the Humble Oil & Refining Company in the Sunniland Field. The average daily production during the month of February 1949 from eight wells was 1,165 barrels. The total production of oil in Florida from the discovery date September 26, 1943 to February 28, 1949, was 721,142 barrels.

The Survey has issued two mimeographed reports entitled "Exploration for Oil and Gas in Florida." The first of these covered such activities from earliest beginnings to January 1948; the second is a revision of the first with the addition of exploration activities for the calendar year 1948. The following data are therefore given in a summarized form.

From available records many of which lack desirable details it is known that 216 wells have been drilled in Florida as tests for oil or gas up to December 31, 1948. On January 1, 1949, there were five wells drilling. During the year 1948 twenty-five wells were completed and of these three were completed as oil producers. The total footage drilled in 1948 was 196,820 feet equal to 37.28 miles. From these figures it is readily apparent that prospecting for oil in Florida has assumed comparatively large proportions and should additional

wells be brought in and other fields discovered it is difficult to predict the proportions to which this industry will enlarge.

Of the wells completed during this two-year period one deserves particular mention because of the exceptional depth to which it was drilled even though it did not prove productive. This is the State of Florida J. P. Scranton No. 1, Lease No. 373 well of the Gulf Oil Corporation completed April 1, 1947, on Big Pine Key about 30 miles east of Key West, Monroe County. This well was begun November 7, 1945, and activities were stopped April 1, 1947, at a total depth of 15,455 feet, in dense lime with irregular shows of dead oil. This is the deepest test so far drilled in Florida.

It is a satisfaction to record the uniform courteous and business-like manner in which the various oil companies operating in Florida have responded to the rules and regulations of the State Board of Conservation.

The table on page 23 gives pertinent data on the wells that have produced oil in the Sunniland Field. Only one of these has been finally abandoned as a producer, the discovery well, which is now utilized for disposal of brine or salt water.

RECOMMENDATIONS

It is recommended that a policy relating to the administration of the Oil Conservation Act be established. The administration of the law has gone on fairly well since its enactment but should oil be discovered in greater quantity the needed attention could not be given by the Secretary of State and the Florida Geological Survey as is now done. Provision should also be made for the disposition of the funds already collected and accumulated in the State Treasury. A suggestion here would be that they be applied toward the salary of a petroleum engineer whose duty would be to supervise the Oil and Gas Act.

DATA ON PRODUCING WELLS OF THE HUMBLE OIL & REFINING COMPANY IN THE SUNNILAND FIELD, COLLIER COUNTY

Farm Name	Location	Started	Completed	Depth	Producing Zone	Remarks
Gulf Coast Realities Corporation No. 1	1980' W. of E. line, 660' N. of S. line of Sec. 29, T48S, R30E	February 28, 1943	September 26, 1943	11,626	11,600- 11,626	Pumper. Shut down June 15, 1946. Abandoned as producer May 14, 1947. Used for dis- posal salt water. Initial prod. 97 bbls. oil.
Gulf Coast Realities Corporation No. 4	1996' from N. line, 2054' from E. line Sec. 20, T48S, R30E	October 31, 1944	May 7, 1945	11,597	11,560- 11,597	Pumper. Initial prod. 257 bbls.
Gulf Coast Realities Corporation No. 5	Cen. SW $\frac{1}{4}$ of SW $\frac{1}{4}$ of Sec. 20, T48S, R30E	March 2, 1947	May 24, 1947	11,578	11,560- 11,578	Flowed initially. Pumped since June 29, 1945. Initial prod. 518 bbls.
∞ Gulf Coast Realities Corporation No. 6	SW $\frac{1}{4}$ of NE $\frac{1}{4}$ of Sec. 19, T48S, R30E	November 7, 1945	May 1, 1946	11,578	11,556- 11,578	Flows. Initial prod. 225 bbls.
Gulf Coast Realities Corporation No. 8	SW $\frac{1}{4}$ of SE $\frac{1}{4}$ of Sec. 19, T48S, R30E	May 24, 1946	September 3, 1946	11,576	11,564- 11,569	Flowed initially. Pumped since December 1948. Initial prod. 527 bbls.
Gulf Coast Realities Corporation No. 10	Cen. SW $\frac{1}{4}$ of SE $\frac{1}{4}$ of Sec. 20, T48S, R30E	November 1, 1947	January 8, 1948	11,574	11,566- 11,574	Flows. Initial prod. 175 bbls.
Gulf Coast Realities Corporation No. 11	2323' N. from S. line, 660' E. from N. line Sec. 20, T48S, R30E	July 5, 1947	October 14, 1947	11,573	11,550- 11,573	Flows. Initial prod. 120 bbls.
Gulf Coast Realities Corporation No. 13	Cen. NW $\frac{1}{4}$ of NW $\frac{1}{4}$ Sec. 19, T48S, R30E	October 7, 1948	December 25, 1948	11,572½	11,519- 11,572½	Flows. Initial prod. 395 bbls.
Lee Tidewater Cypress Lumber Company "B" 1	660' W. of E. line, 660' N. of S. line Sec. 13, T48S, R29E	May 21, 1948	September 22, 1948	11,588	11,568- 11,588	Flows. Initial prod. 137 bbls.
Lee Tidewater Cypress Lumber Company "B" 2	Cen. SE $\frac{1}{4}$ of NW $\frac{1}{4}$ Sec. 13, T48S, R29E	January 7, 1949	February 11, 1949	11,585	11,564- 11,585	Flows. Testing.

FLORIDA MINERAL INDUSTRY DURING 1946 and 1947

Statistics Collected in Cooperation with the
United States Bureau of Mines

A new high record was attained by Florida's mineral industry during 1946 when the total value of mineral products for the year reached \$31,083,000. This record total was surpassed in 1947 when the industry reported a total value of \$45,992,00 for its products, an increase of approximately 48 percent. Startling new high records were made in the phosphate rock industry and the value of phosphate rock in 1947 was greater than the value of *all* mineral products during the previous year. The growth of the mineral industry is shown graphically in Figure 3 which will illustrate the value of Florida mineral products for the ten year period of 1938-1947 inclusive. From this graph it may be seen that there has been a three fold increase in value of the mineral products of the State from 1940 to 1947.

The principal mineral products for Florida in order of their value, are: Phosphate rock, limestone, cement, and sand and gravel. In 1946, the last year for which statistics are available, Florida ranked first among the states in the United States in the production of phosphate rock, rutile, and zircon; second in the production of ilmenite; and third in the production of both Fuller's earth and peat. Known and indicated reserves for all of the above mentioned products are sufficient to support an expanding industry for many years.

The mineral output and value for the years 1946 and 1947 is shown in the table on page 27.

PRODUCERS REPORTING PRODUCTION IN 1946 AND 1947

Product	Company	Location
CEMENT		
	Florida Portland Cement Division,	
	General Portland Cement Company	Tampa
CLAY		
Used by Producer:		
	Florida Portland Cement Division	Tampa
	Peaden Materials Company	Chipley
	Taylor Brick & Tile Company	Pensacola
Non-Commercial:		
	Florida State Hospital	Chattahoochee

FLINT ROCK**Crushed:**

Coy Thomas Industries Gainesville

FULLER'S EARTH

The Floridin Company, Inc. Quincy

ILMENITE, RUTILE AND ZIRCON

Riz Mineral Company Melbourne

Rutile Mining Company of Florida Jacksonville

KAOLIN

Edgar Plastic Kaolin Company Edgar

United Clay Mines, Inc. Hawthorn

LIME

Dixie Lime Products Company Ocala

Miami Lime and Chemical Company, Inc. Miami

LIMESTONE**Concrete, Road Metal and Screenings:**

Camp Concrete Rock Company Ocala

Central Quarries Company Lakeland

C. Meekins Hollywood

Coral Rock & Sand Company Miami

Crystal River Rock Company Leesburg

Cummer Lime and Manufacturing Co. Ocala and Jacksonville

Dixie Lime Products Company Ocala

E. A. Pynchon North Miami

Florida Lime Products Cimpany Ocala

L. B. McLeod Construction Company Orlando

Levy County Lime Rock Corporation Williston

Miami Crushed Stone Company Miami

Miami Lime & Chemical Company, Inc. Miami

Mills Rock Company of Miami, Inc. Miami

Naranja Rock Company, Inc. Naranja and Miami

Newberry Corporation Jacksonville

Oolite Rock Company Miami

Southeastern Rock Company, Inc. Homestead

S. P. Snyder and Son, Inc. Fort Lauderdale

Troup Brothers Miami

Williston Shell Rock Company Ocala

Wm. P. MacDonald Corporation Auburndale

Railroad Ballast and Aggregate:

Miami Crushed Stone Company Miami

Naranja Rock Company, Inc. Naranja and Miami

Agricultural:

Cummer Lime and Manufacturing Co. Ocala and Jacksonville

Dixie Lime Products Company Ocala

Florida Dolomite Company Pembroke

Florida Lime Products Company Ocala

Other Limestone Uses:

Connell and Shultz Inverness

Cummer Lime and Manufacturing Co. .. Ocala and Jacksonville

F. W. Hildebrand Hobe Sound

Ocala Lime Rock Corporation Ocala

Thompson-Williston Mine Jacksonville

Non-Commercial:

Broward County Highway Department Ft. Lauderdale

Palm Beach County Highway Department West Palm Beach

PETROLEUM

Humble Oil and Refining Co. Sunniland

PHOSPHATE

Hard Rock:

C. & J. Camp, Inc.	Ocala
Dunnellon Phosphate Mining Company	Dunnellon
J. Buttgenbach & Company	Lakeland

Soft:

Colloidal Phosphate Sales Company	Dunnellon
Kellogg Company	Ocala
Coronet Phosphate & Fertilizer Company	Bartow
Loncala Phosphate Company	High Springs
Seaboard Phosphate Company	Dunnellon
Soil Builders, Inc.	Dunnellon
Superior Phosphate Company	Dunnellon

Land Pebble:

American Agricultural Chemical Corporation	Pierson
American Cyanamid Company	Brewster
Coronet Phosphate Company	Plant City
International Minerals and Chemical Company	Mulberry
Pembroke Chemical Corporation	Pembroke
Swift and Company Fertilizer Works	Bartow
The Davison Chemical Company	Bartow
The Phosphate Mining Company	Nichols

SAND AND GRAVEL

Structural Sand:

Alfred Destin Company	Miami Beach
Bailey, Westcott and Bailey, Inc.	Clermont
Campbell & Johnson	Flomaton, Ala.
Central Sand Company	Tavares
Cummer Lime and Manufacturing Co. ..	Ocala and Jacksonville
D. & B. Sand Company	Tampa
Diamond Interlachen Corporation	Jacksonville
Florida Gravel Company	Chattahoochee
Howard Backus	Miami
Keuka Sand Company	Keuka
Lake Wales Concrete Sand Company	Lake Wales
Lake Wales Independent Sand Company	Lake Wales
Lakeland Cement Company	Lakeland
Largo Washed Sand Company	Largo
Maule Industries	Miami
The Davison Chemical Company	Bartow
United Clay Mines Corporation	Hawthorn

Paving Sand:

Central Sand Company	Tavares
Diamond Interlachen Corporation	Jacksonville
Florida Gravel Company	Chattahoochee
Keuka Sand Company	Keuka
Lake Wales Concrete Sand Company	Lake Wales
Ward Gravel Company	Pensacola

Other Sand Uses:

Cummer Lime and Manufacturing Co.	Ocala and Jacksonville
Florida Gravel Company	Chattahoochee
Keuka Sand Company	Keuka
Ward Gravel Company	Pensacola

Non-Commercial Sand:

Clay County Highway Department	Green Cove Springs
Palm Beach County Highway Department	West Palm Beach

Structural Gravel:

Campbell & Johnson Flomaton, Ala.
 Florida Gravel Company Chattahoochee
 Hauser Concrete Company DeLand
 Maule Industries Miami

Paving Gravel:

Edgar Brothers Concrete Products Daytona Beach
 Florida Gravel Company Chattahoochee
 Ward Gravel Company Pensacola

Railroad Ballast and Other Gravel:

Florida Gravel Company Chattahoochee
 Maule Industries Miami
 Ward Gravel Company Pensacola

SUMMARY OF MINERAL PRODUCTION IN 1946 and 1947

Product	1946		1947	
	Quantity	Value	Quantity	Value
Clay (Raw) (short tons)	80,379	\$ 486,791	96,147	\$ 527,976
Natural Gas (M cubic feet)	6,000	193	8,000	258
Peat (short tons)	19,979	81,832	42,300	126,000
Petroleum (barrels)	57,000	*	259,000	*
Phosphate				
Land pebble (long tons)	4,807,563	19,867,339	6,314,077	31,975,858
Soft rock (long tons)	97,067	387,708	88,620	326,064
Hard rock (long tons)	100,881	762,127	79,330	618,330
Total value of phosphate		21,017,174		32,920,252
Sand and Gravel (short tons)	1,534,667	1,320,819	2,067,401	1,880,866
Crushed limestone (short tons)	2,863,070	3,212,135	3,534,010	4,511,894
Miscellaneous*		5,005,456		6,083,838
Total value, eliminating duplications		\$31,093,000		\$45,992,000

* Miscellaneous includes value of: Cement, Heavy Clay Products, Fuller's earth, Kaolin, Lime, Petroleum, Dimensional limestone, Unclassified stone, Titanium concentrates: ilmenite and rutile, and zircon.

Water, Shells, Concrete Blocks, Sandlime Brick statistics not collected.

VALUE OF FLORIDA MINERAL PRODUCTS 1938—1947

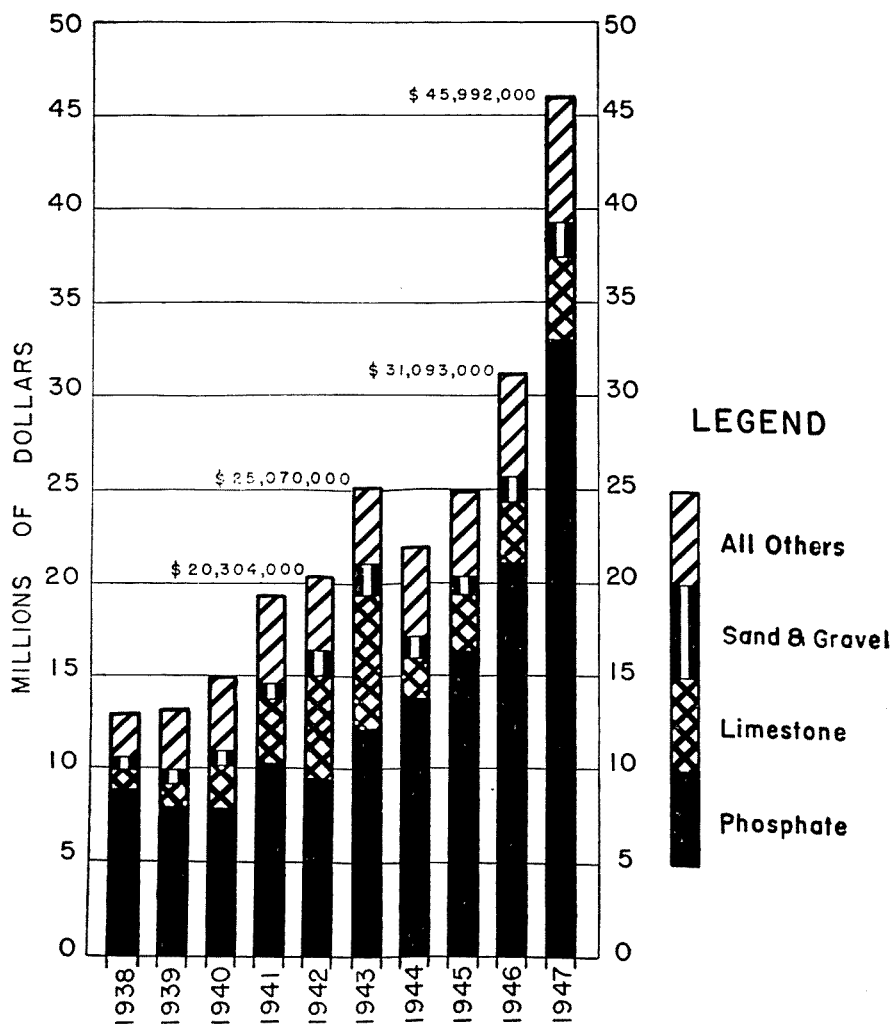


Figure 3—Graph of Total Value of Mineral Production of Florida for the Period 1938 to 1947 inclusive.

FINANCIAL STATEMENT

1947

January 1—December 31

RECEIPTS

Salaries, Balance Jan. 1	\$24,560.85	
General Revenue July 1	37,306.87	
		\$61,867.72
Expenses, Balance Jan 1	12,529.11	
General Revenue July 1	34,693.13	
		47,222.24
Governor's Emergency Fund, Balance		
Jan. 1	10,666.98	
Special fund—Chapter 24,283	24,000.00*	
		34,666.98
		\$143,756.94

DISBURSEMENTS

Salaries		35,717.12	
Expenses			
Travel	2,346.30		
Car trade-in	750.00		
Car operation	1,730.43		
Supplies: Field, Laboratory, Office,			
Library	6,574.04		
Utilities	489.73		
Subscriptions, Dues, Books	557.69		
Postage, Tel. and Tel., Express	951.72		
Printing Publications	7,387.17		
Miscellaneous	421.80		
U.S.G.S. Cooperative Program, F.G.S.			
Ground Water	6,751.74		
Surface Water	2,869.81		
Quality of Water	500.00		
		31,330.43	
U.S.G.S. Cooperative Program			
Governor's Emergency Fund	10,666.98		
Special Fund—Chapter 24,283 ..	7,673.36		
		18,340.34	
Balance in Salary Account Dec. 31	26,150.60		
Balance in Expense Account Dec. 31 ..	15,891.81		
Balance in Special Fund—Chap. 24,283	16,326.64		
		58,369.05	
			\$143,756.94

* \$25,000 was available but U. S. Geological Survey could match only \$24,000.

FINANCIAL STATEMENT

1948

January 1—December 31

RECEIPTS

Salaries, Balance Jan. 1	\$26,150.60	
General Revenue July 1	52,906.48	
		\$79,057.08
Expenses, Balance Jan. 1	15,891.81	
General Revenue July 1	34,724.28	
Refund—Express loss	35.00	
		50,651.09
Special Fund—Chapter 24,283, Balance January 1	16,326.64	
		16,326.64
		\$146,034.81

DISBURSEMENTS

Salaries		39,699.39
Expenses		
Travel	2,245.08	
Car trade-in	1,426.26	
Car operation	1,502.44	
Supplies: Field, Laboratory, Office, Library	3,318.52	
Utilities	207.33	
Subscriptions, Dues, Books	452.65	
Postage, Tel. and Tel., Express	566.32	
Printing publications	8,945.26	
Miscellaneous	849.13	
U.S.G.S. Cooperative Program, F.G.S.		
Ground Water	2,253.69	
Surface Water	2,727.46	
Quality of Water	500.00	
		24,994.14
U.S.G.S. Cooperative program, Special Fund—Chapter 24,283		
Ground Water		16,326.64
Balance in Salary account July 1	8,432.57	
Balance in Expense account July 1	1,944.30	
Balance in Salary account Dec. 31		
(Unreleased)	30,925.12	
Balance in Expense account Dec. 31		
(Unreleased)	23,712.65	
		65,014.64
		\$146,034.81

