BIBLIOGRAPHY OF

PUBLICATIONS RELATING TO GROUND WATER

IN CONNECTICUT

by

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Hartford, Connecticut
July 1-2, 1960

Revised July 1, 1960

(PROVISIONAL, SUBJECT TO REVISION)
50-67
INTRODUCTION

The United States Geological Survey is currently investigating the groundwater resources of Connecticut in cooperation with the State Water Commission. As part of this cooperative project, in order to summarize the knowledge already gained about ground water in the State, a bibliography of reports dealing with ground water in Connecticut has been prepared. A compilation entitled "Bibliography and index of publications relating to ground water prepared by the Geological Survey and cooperating agencies", by G. A. Waring and O. E. Meinzer, was issued as U. S. Geological Survey Water-Supply Paper 992 in 1947. The following compilation lists all the papers in Water-Supply Paper 992 that refer to Connecticut plus other short reports not included in the latter.

The first studies of ground water in Connecticut were begun in 1903 by Professor H. E. Gregory of Yale University under the auspices of the U. S. Geological Survey. The early studies were of the reconnaissance type, covering large sections of the State, and were concerned mainly with the relation of the bedrock geology to the water supply. The results were published in several Water-Supply Papers of the Geological Survey. In 1911 a cooperative agreement for the study of the ground-water resources of Connecticut in which each party shared equally in the expenses was made between the Federal Survey and the Connecticut State Geological and Natural History Survey. As a result more detailed studies in smaller areas were undertaken. Active field work covering more than half the State was continued through 1923 under this arrangement and the results published in eight U. S. Geological Survey Water-Supply Papers.

After an eleven year period of inactivity and with the inauguration of the Federal Emergency Relief Commission, detailed studies of ground water in Connecticut were begun again in October 1934 as a project of the Emergency Relief Commission (later the Works Progress Administration). The project was sponsored by the Connecticut State Water Commission, the State Planning Board, and the U. S. Geological Survey. The technical direction of the work was undertaken by the Geological Survey. The project consisted of an inventory and mapping of wells and springs in the State by towns and the recording of weekly observations of water levels in selected wells. The data collected through October 1939 were published in six mimeographed bulletins and one typewritten bulletin by the Works Progress Administration.

In 1939, when it became necessary to curtail the work being carried on by the Works Progress Administration, cooperation was arranged between the Federal Geological Survey and the State Water Commission to continue investigations relative to the over-development of ground-water supplies in the New Haven area. From time to time additional funds have been made available to meet growing demands by the State for data on its ground-water supplies and the present cooperative program between the U. S. Geological Survey and the State Water Commission is a continuation of the original arrangement. It is estimated that about 14 per cent of the State has been covered by recent ground-water surveys and in addition some data are available for another 20 per cent of the State.
Part I, the bibliography, has a total of 57 publications or reports relating to ground water in Connecticut that have been issued through June 1, 1950. A brief abstract is given for each paper. The references are grouped under the agency responsible for publication and are listed chronologically within groups. Each reference has been assigned a number according to the order in which it is listed. An attempt has been made to include references to all material issued by agencies directly concerned with the study of ground water in Connecticut. It was therefore necessary to omit such related material as newspaper articles and project reports of professional engineers. Unintentional omissions possibly have been made, however, and the writer wishes that any such omissions be called to his attention, in order that they may be added at a later date. Information of this nature should be addressed to the U. S. Geological Survey, Ground Water Branch, Post Office Building, Middletown, Connecticut.

To aid in locating a report covering a particular area, an index map is included at the rear of the bibliography. For each town in the State in which water conditions have been investigated the published report covering that town is indicated by a number. The number corresponds to the number assigned that particular report in the bibliography. Most of the reports relating to ground water in Connecticut are now out of print. However, copies are on file at the office of the State Water Commission, Room 317 State Office Building, Hartford; at the office of the U. S. Geological Survey, Room 1, Post Office Building, Middletown, and 203 Post Office Building, Hartford; and at most of the larger libraries in the State.

It should be pointed out again that cooperative investigations of the ground-water resources of Connecticut are currently in progress and that considerable information of recent date has been gathered for areas about the State, a substantial proportion of which has not as yet been published. Much of the data are placed on open file in the office of the Geological Survey, Post Office Building, Middletown, Connecticut and are available either upon request or through examination at Middletown.

Part II, an appendix to the bibliography, is a list of general references dealing with the subject of ground water and a list of publications dealing with the general geology of the State. Also included is a list of the several libraries in the State where publications of the State and Federal Government may be found.

PART I - BIBLIOGRAPHY

PUBLICATIONS ISSUED BY THE FEDERAL GOVERNMENT

United States Geological Survey

(*Denotes those publications prepared in cooperation with the Connecticut Geological and Natural History Survey.*)

1. Contributions to the hydrology of Eastern United States 1903, by H. L. Fuller, geologist in charge; Water-Supply Paper 102, 1904.

Section on Connecticut, by H. E. Gregory, pp 127-168. Contains records of about 470 wells and 84 springs and analyses of 19 well waters and 19 spring waters.


Triassic rocks of the Connecticut Valley as a source of water supply, by M. L. Fuller, pp 95-112. Describes the structure of the Triassic rocks; treatises on the source and quality of water in the rocks and the method of recovering this water; includes analyses of water from 11 wells and 5 springs.


Section on Connecticut, pp 23-24. Gives location by towns, depth, diameter, yield, water level, and other available information concerning 26 wells ranging in depth from 400 to 6,004 feet.


Describes the physiography and geology, and the circulation, quantity, temperature, quality, and contaminate of the ground water of the State. Discusses the water in the crystalline rocks, and Triassic sandstones and traps, and the glacial drift. Discusses also the methods of constructing wells and the character and use of the springs. Gives records of wells and springs and analyses of ground waters. Includes detailed descriptions of the towns of Warren, North Haven, and Branford Point.


Covers the towns of Bloomfield, Canaan, East Hartford, East Windsor, Essex, Franklin, Greenwich, Hartford, Manchester, Newington, North Canaan, Old Lyme, Salisbury, Saybrook, Stamford, South Windsor, West Brook, West Hartford, Wethersfield, Windham, and Windsor. Discusses the origin, circulation, quantity, and quality of the waters in stratified and unstratified drift, crystalline rocks, traps, Paleozoic limestones, and Triassic sandstones. Discusses ground water for municipal use and the construction of drilled, driven, and dug wells, and infiltration galleries. Describes the municipal pumping plants at Brookline, Mass., Brooklyn, N. Y., and Plainfield, N. J. Describes the ground-water conditions in detail, by towns. Contains numerous tables of well data and water analyses, and includes maps showing water-bearing formations, depths to water, locations of wells, and woodlands.

Discusses the water in glacial drift and crystalline rocks, ground water for private and municipal uses, and methods of developing ground-water supplies. Describes the municipal pumping plants at Brookline, Mass., Brooklyn, N. Y., and Plainfield, N. J. Describes in detail the water-bearing formations and water supplies in the towns of Ansonia, Beacon Falls, Middlebury, Naugatuck, Oxford, Seymour, Thomaston, Waterbury, and Watertown. Contains tables of well data and water analyses and includes a map showing areas underlain by stratified drift, rock outcrops, woodlands, and locations of wells and springs.


Covers parts of Hartford, New Haven, and Middlesex Counties, Connecticut. Describes occurrence and availability of ground-water supplies, methods of well construction, and quality of ground water. Contains descriptions of towns with reference to geology, surface water, ground water, records of wells and springs, and water analyses. Includes maps showing areal geology, extent of glacial deposits, and forested areas.


Covers parts of Litchfield, New Haven, and Hartford Counties, Conn. Discusses physiography, geology, water-bearing formations, artesian conditions, springs, means of recovery of ground water, ground water as a source of public supply, and quality of water. Describes towns individually with reference to local aquifers, quality of water, public water supply, and well and spring records. Includes tables of analyses and a geologic map.


Covers parts of Fairfield and Hartford Counties, Conn. Discusses the physiography, geology, water-bearing formations, artesian conditions, springs, means of recovery of ground water, ground water for public supplies, and quality of water. Describes the towns individually with reference to local aquifers, quality of water, public water supply, and well and spring records. Includes tables of analyses and geologic map of the area.


Discusses the subject of coastal ground water, with special reference to the New Haven, Conn. area. Describes the geology, physiography, and ground-water conditions in the New Haven coastal area, with a discussion of the Ghyben-Herschberg theory of fresh and salt water relationships, contamination by salt water, effects of pumping and tides on contamination, and the nature of the fresh and salt water contact. Includes a geologic map, water analyses, descriptions of wells, springs, and pumping plants in the New Haven area, and a bibliography of coastal ground water.

Covers New Haven County and part of Middlesex County, Conn. Discusses the geology and physiography of the area and the ground-water resources with respect to occurrence, quality, and methods of recovery. Describes the public water supplies and gives records of wells and springs in the several towns, with water analyses. Includes a geologic map.


Describes the geography and geology of the Pomperaug Basin and the ground-water resources of the towns of Bethlehem, Southbury, and Woodbury, Conn. Discusses the methods of making a ground-water inventory with regard to precipitation, evaporation, and surface-water and ground-water runoff; gives a monthly inventory 1913-16. Includes a discussion of relation of water table fluctuations to ground-water storage. Contains geologic map.


Section on Conn. by W. H. Brothwell, pp 35-39. Reviews history of ground-water investigations in the State. Discusses observation well programs carried out by Works Progress Administration.


Section on Conn. pp 48-49. Discusses Works Progress Administration program for 1938 and lists reports published by that program.


Section on Conn., New Haven County, by J. G. Ferris, pp 56-63. Discusses details of ground-water investigation in New Haven area and contains records of water levels in 24 wells.


Sections on Conn. by Jean Lowry, pp 6-17. Briefly discusses ground-water conditions in New Haven during 1943. Contains records of water levels in 21 wells.


Section on Conn. by Jean Lowry, pp 5-22. Outlines ground-water studies made in Connecticut during 1944. Briefly discusses geology and ground-water conditions in Waterbury. Contains records of water levels in 51 wells in Connecticut by counties.


Section on Conn., by R. V. Cushman, pp 5-17. Outlines program for 1946. Contains records of water level in 45 wells in Connecticut by counties.

25. Lists and analyses of the mineral springs of the United States (a preliminary study) by A. C. Poale: Bull. 32, 1886.

On p. 25 lists 16 mineral springs in Connecticut, all classed as weakly mineralized and comparatively unimportant.

   Section on Connecticut, p 44. Lists by owner and location 9 deep wells drilled in the State in 1904.


   Section on Connecticut, p 44-45. Lists by owner and location 12 deep wells drilled in the State in 1905.


   Discusses geology, ground-water occurrence, and industrial usage of ground water in Middletown. Describes the public-supply system and gives tables of reservoir data and daily withdrawals. Suggests areas for future development of ground-water supplies.


   Discusses geology, ground-water conditions, and the use of ground water by industrial plants in the area. Discusses the contamination of well water by acid industrial wastes and suggests method for further study.


   Reviews geology and ground-water conditions in the area and contains a further discussion of contamination by acid industrial wastes. Includes a geologic map showing well locations, and a comparative hydrograph of water levels.

31. Ground-water conditions at the site of the proposed Fairfield County Jail Farm, Fairfield, Connecticut, by J. J. Miles, Jr. December 1946. 6 pp. (Typewritten)

   Discusses geology and ground-water conditions in the vicinity of proposed site. Includes a map showing location of site and topography.


   Discusses geology and ground-water conditions in New Milford, Conn.

33. Ground-water conditions at the site of a proposed Fairfield County Jail Farm, Trumbull, Connecticut, by R. V. Cushman. December 1947. 6 pp. (Typewritten)

   Discusses geology and ground-water conditions in vicinity of proposed site. Includes a map showing location of site and topography.
Works Progress Administration for Connecticut

(The following bulletins were prepared in cooperation with the Connecticut State Water Commission)

34. Record of wells, springs, and ground-water levels in the towns of Bridgeport, Easton, Fairfield, Stratford, and Trumbull, Conn., by R. M. Leggette and others; Connecticut Ground-Water Survey Bull. GW-1, Hartford, Conn., November 1938. 242 pp. (Mimeographed.)

Gives the owners, elevations above sea level, types, depths, diameters, depths to bedrock, water levels, chloride determinations, and maps showing the locations of 1,873 wells in 5 towns in southwestern Connecticut.

35. Record of wells, springs, and ground-water levels in the towns of Branford, Chester, Clinton, Essex, Guilford, Haddam, Killingworth, Madison, North Branford, Old Saybrook, Saybrook, and Westbrook, Conn., by R. M. Leggette and others; Connecticut Ground-Water Survey Bull. GW-2, Hartford, Conn., 1938. 340 pp. (Mimeographed.)

Gives tabulated data on 2,624 wells in the 12 towns. Includes maps showing the location of wells and springs.

36. Record of wells, springs, and ground-water levels in the towns of Bethany, East Haven, Hamden, Milford, North Haven, Orange, West Haven, and Woodbridge, Conn., by R. M. Leggette and others; Connecticut Ground-Water Survey Bull. GW-3, Hartford, Conn., 1938. 247 pp. (Mimeographed.)

Gives tabulated data on 1,847 wells in the 8 towns named. Includes maps showing the location of wells and springs.

37. Record of wells, springs, and ground-water levels in the towns of Berlin, Cromwell, Durham, Meriden, Middlefield, Middletown, Portland, and Wallingford, Conn., by R. M. Leggette and others; Connecticut Ground-Water Survey Bull. GW-4, Hartford, Conn., 1938. 170 pp. (Mimeographed.)

Gives tabulated data on 1,158 wells in the 8 towns named. Includes maps showing the location of wells and springs.


Gives tabulated data on 3,042 wells in the 8 towns named. Includes maps showing the location of wells and springs.


PUBLICATIONS ISSUED BY THE STATE OF CONNECTICUT

State Water Commission

41. Report on the water resources of Connecticut to the Governor, 1930.
Contains recommendations of the Commission regarding proposed study of the State's water resources and a draft of an act creating a State Water Conservation Commission.

Contains a description of the ground-water investigation being conducted in the New Haven area, one of the most critical in the State with respect to ground-water supply.

Summarizes the progress of ground-water studies in Connecticut during biennium.

Summarizes the progress of ground-water studies in Connecticut during biennium.


Discussos the work done on ground water in Connecticut since 1903 and gives recommendations for future study; contains a list of publications on ground water.

State Department of Health


Contains a tabulation of various public and semi-public water supplies in Connecticut, including those obtained from ground water, with information as to ownership, date of inauguration of supply, sources of supply, extent of service, estimated population supplied, source of pressure, and types of treatment. Also listed are averages over a five year period of laboratory determinations on all water samples collected from the various supplies.


Contains up-to-date information similar to that given in first edition.


Contains up-to-date information similar to that given in previous issues.

State Board of Agriculture


Journal Articles


Describes contamination of wells near the Connecticut coast by sea water, and the relation of topography and geology to the wells. Explains the law of equilibrium of salt and fresh water, as developed by Ghyben and later by Herzborg. Discusses the effects of pumping, the season, and the tides, on the saline contamination.

Contains statistics relative to the various public water supplies of Connecticut, including ground water supplies, covering the year ending December 31, 1927. Tabulation lists ownership, date of inauguration, estimated population, supplied, source of supply, source of pressure, types of treatment, and extent of service.


The two general sources of ground-water supply in New England are the bedrock, which is suitable for small individual supplies, and the glacial sand and gravel, which are adaptable to large supplies. Outlines the theory of formation of sand and gravel bodies by glaciation. By means of correlation between iron content of well water and the areas of older drift refutes the belief that the last or late Wisconsin ice covered all New England. Contains maps showing the position and extent of the Wisconsin ice according to two theories.


Gives data on a study of ground-water conditions in the New Haven area, with graphs showing the relation between ground-water level, pumpage, and precipitation. Most of the ground water is from glacial drift. Increased pumpage for industrial uses has caused some increase in the infiltration of salt water.


PART II - APPENDIX

Selected References on Ground-Water Hydrology


ALDENDA

PUBLICATIONS ISSUED BY THE U. S. GEOLOGICAL SURVEY

58. Memorandum on ground-water conditions in Middletown, Connecticut; by
R. V. Cushman: Typewritten report in open files of U. S.

Describes the occurrence of ground water in glacial outwash
and till, alluvium, and bedrock. The distribution of the glacial
deposits and the alluvium are shown on a map.

PUBLICATIONS ISSUED BY STATE OF CONNECTICUT

59. Statement on ground water in Connecticut, by R. V. Cushman;
Conn. Devel. Comm. Reference Manual of Indian Location Factors,

A brief discussion of occurrence, availability, and quality
of ground water in Connecticut. Gives estopped yields of wells
in the several aquifers. Map shows promising areas for moderate
to large ground-water development.

60. Ground water in Connecticut; chapter in Water Resources of
to the General Assembly, 6 p., 2 tables, 3 figs., 1957.

Discusses the history of cooperative ground-water investiga-
tions in Connecticut. Discusses briefly the occurrence,
availability, and quality of ground water in Connecticut. Gives
estopped yields of wells in the several aquifers and incorporates
a map showing promising areas for moderate to large ground-
water development. Gives estimated use of ground water in 1956
and indicates areas of concentrated withdrawal.

Discuss effect of rock type, geologic structure, topography, well depth, and type of overburden on the yield of wells in bedrock. Averages of data for rock wells in southern New England are summarized in five tables.

A map shows the generalized bedrock geology of southern New England (scale about 1:1,600,000).


The principal water-bearing units in the 640-sq-mi area are sands and gravels of glacifluvial and glaciolacustrine deposits. Yields range from 50 to 600 gpm. The bedrock and ground moraine generally will yield small supplies averaging 10 to 15 gpm but sandstone and shale beds yield up to 150 gpm to a few wells. The distribution of the principal water-bearing units and the topography of the buried bedrock surface are shown on maps.


General References on the Geology of Connecticut


Libraries Containing Public Documents

1. Connecticut State Library, 231 Capitol Avenue, Hartford, Conn.

2. Hartford Public Library, 624 Main Street, Hartford, Conn.

3. Trinity College Library, Summit Street, Hartford, Conn.

4. Wesleyan University Library, Church Street, Middletown, Conn.

5. New Haven Public Library, 133 Elm Street, New Haven, Conn.

6. Yale University Library, High Street, New Haven, Conn.

7. Bridgeport Public Library, 925 Broad Street, Bridgeport, Conn.
