Information Circular
Number 4

UNIVERSITY OF WISCONSIN
WISCONSIN GEOLOGICAL AND NATURAL HISTORY SURVEY
George F. Hanson, State Geologist

WATER LEVELS IN OBSERVATION WELLS IN WISCONSIN THROUGH 1957

By

R. E. Audini, C. F. Berkstresser, Jr., and D. B. Knowles

U. S. Geological Survey

Prepared by
United States Geological Survey
in cooperation with the
Wisconsin Geological and Natural History Survey

Madison, Wisconsin
1959

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WATER LEVELS IN OBSERVATION WELLS IN WISCONSIN

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INTRODUCTION

Purpose and scope

A fundamental part of the program of ground-water investigations in Wisconsin, begun in 1946 by the United States Geological Survey in cooperation with the Wisconsin Geological and Natural History Survey, is the collection of water-level data. The purpose of collecting water-level data is to determine short-term changes and long-range trends in ground-water levels in wells, and to relate these data to changes in storage in the ground-water reservoirs. This report summarizes water-level trends in Wisconsin through 1957.

In 1934-35, systematic measurements of ground-water levels were begun in a few wells in southwestern Wisconsin by the Soil Conservation Service, U. S. Department of Agriculture, and in central and northeastern Wisconsin by the Wisconsin Conservation Department. In 1946, water-level measurements were made in 77 observation wells by the U. S. Geological Survey in cooperation with the Wisconsin Geological and Natural History Survey.

By 1957, measurements were made in 204 wells in 65 of the 71 counties in the State. Of these wells 26 were equipped with continuous recording gages, 41 were measured weekly, 9 were measured monthly, and 128 were measured quarterly. The distribution of the 204 observation wells is shown in figures 1a-1e, the principal geologic formation tapped by each well is listed in table 1, and the highest and lowest ground-water levels of record are listed in table 2. Hydrographs of water levels in the 166 observation wells with records of three years or longer are shown in figures 13 through 160.

From 1935 through 1955, the water-level data was published in tabular form annually in the U. S. Geological Survey Water-Supply Paper Series, "Water levels and artesian pressure in observation wells in the United States" (Meinzer, Wenzel, and others, 1936-40; Meinzer, Wenzel, and others, 1942-46; Sayre and others, 1947-57). For 1956 and subsequent years, water-level data for a basic Federal network of about 80 wells will be published in tabular form at 5-year intervals.

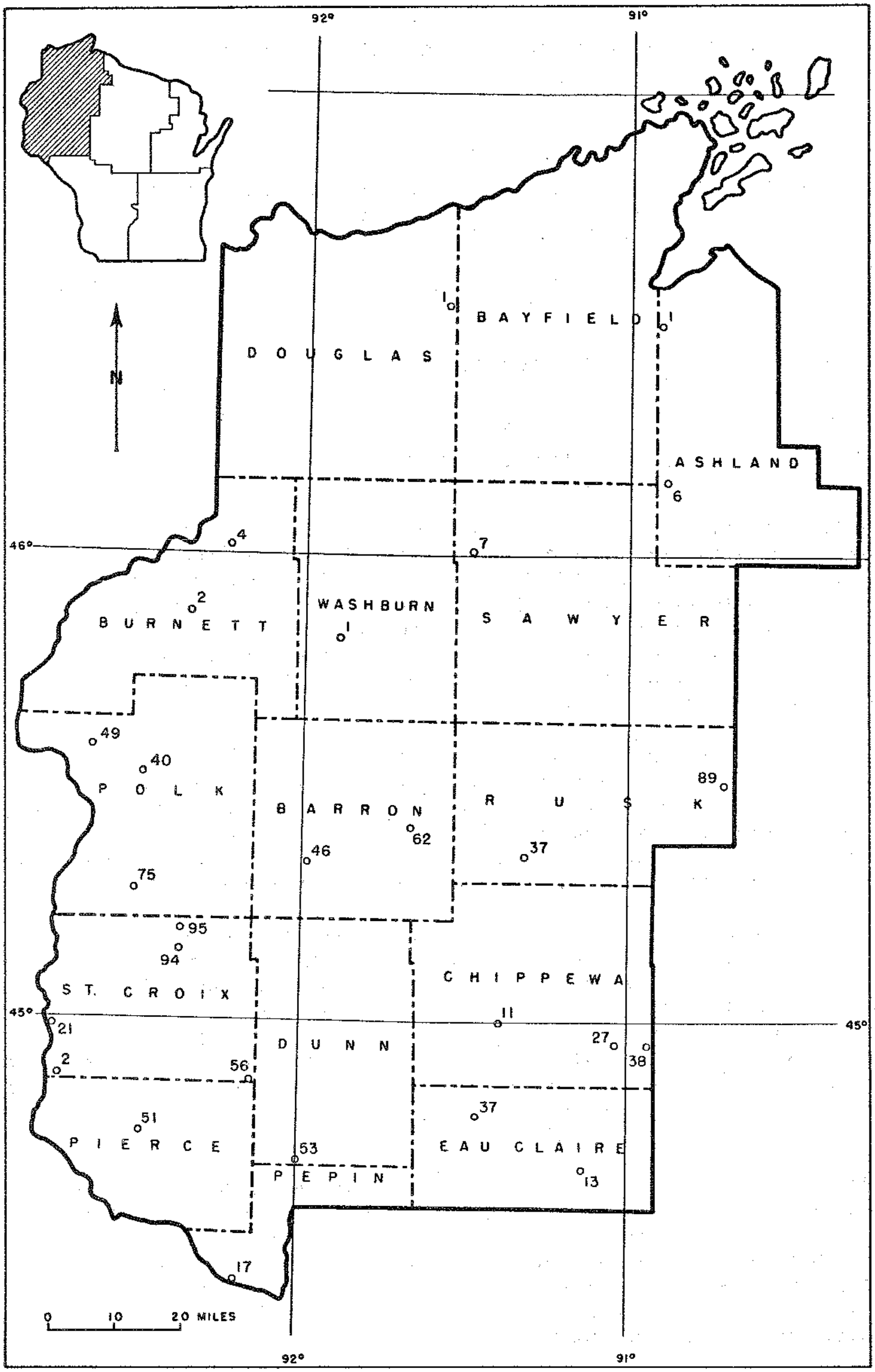


Figure 1a.--Map of northwestern Wisconsin showing locations of observation wells in 1957.

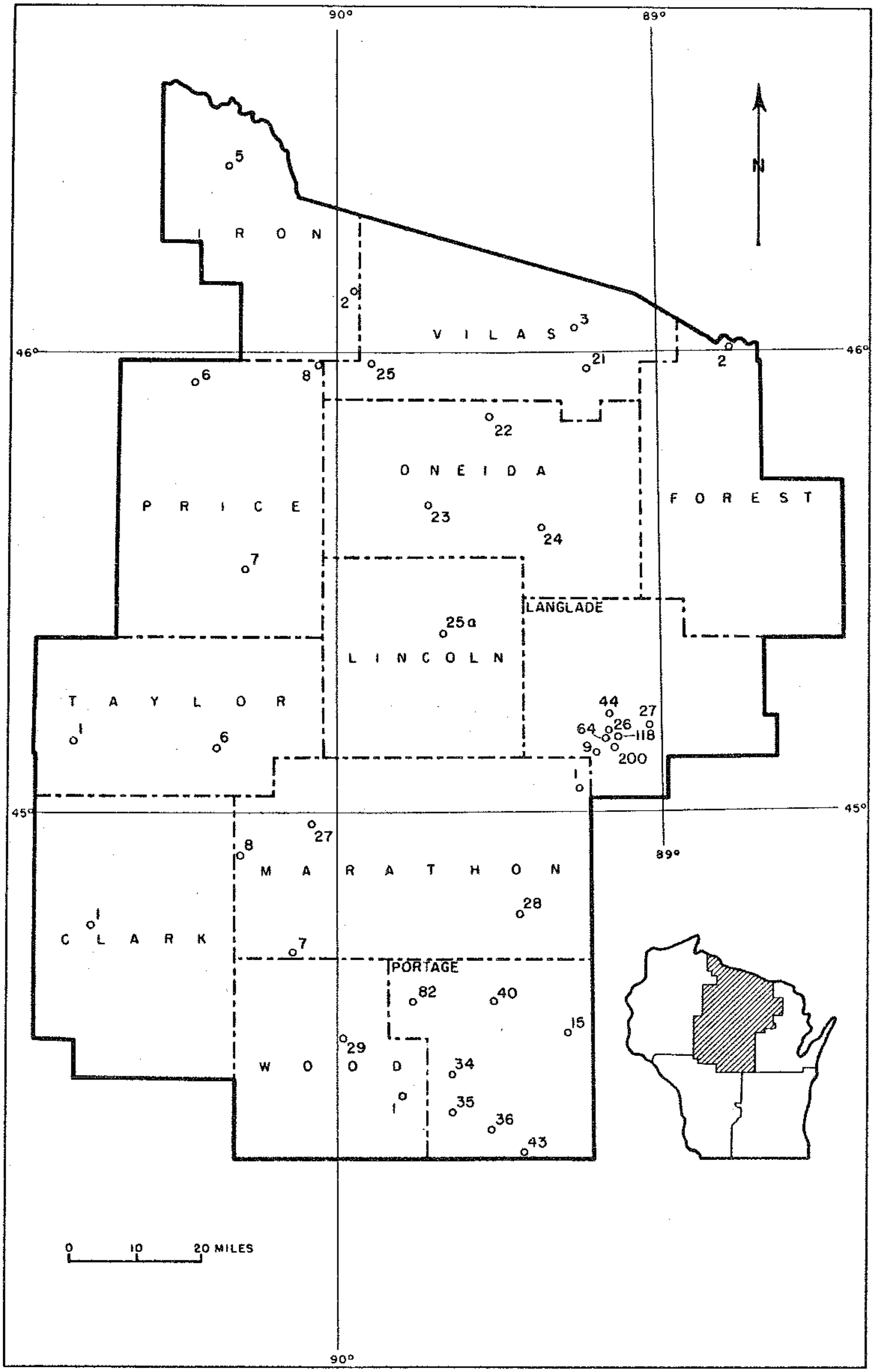


Figure 1b.--Map of north-central Wisconsin showing locations of observation wells in 1957.

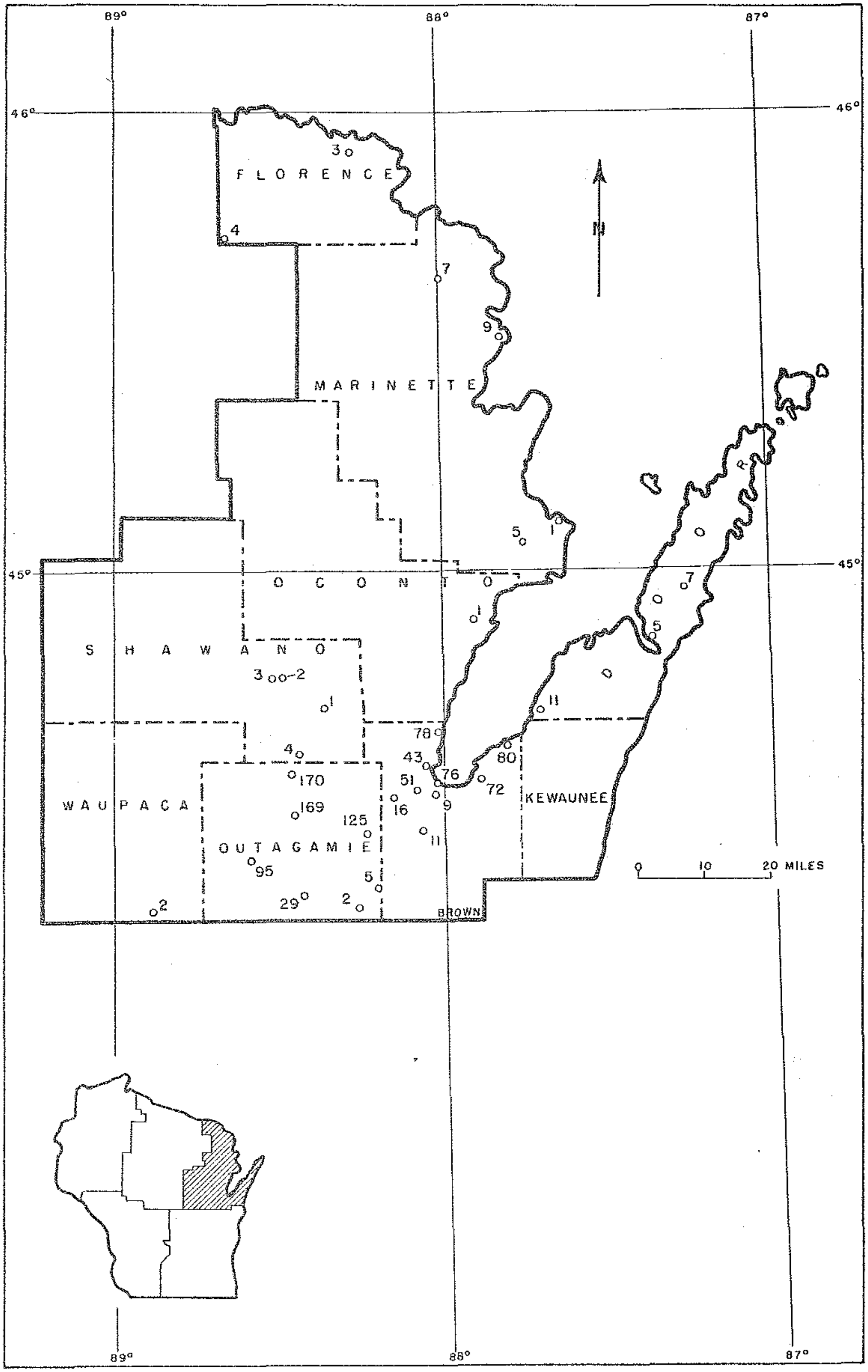


Figure 1c.--Map of northeastern Wisconsin showing locations of observation wells in 1957.

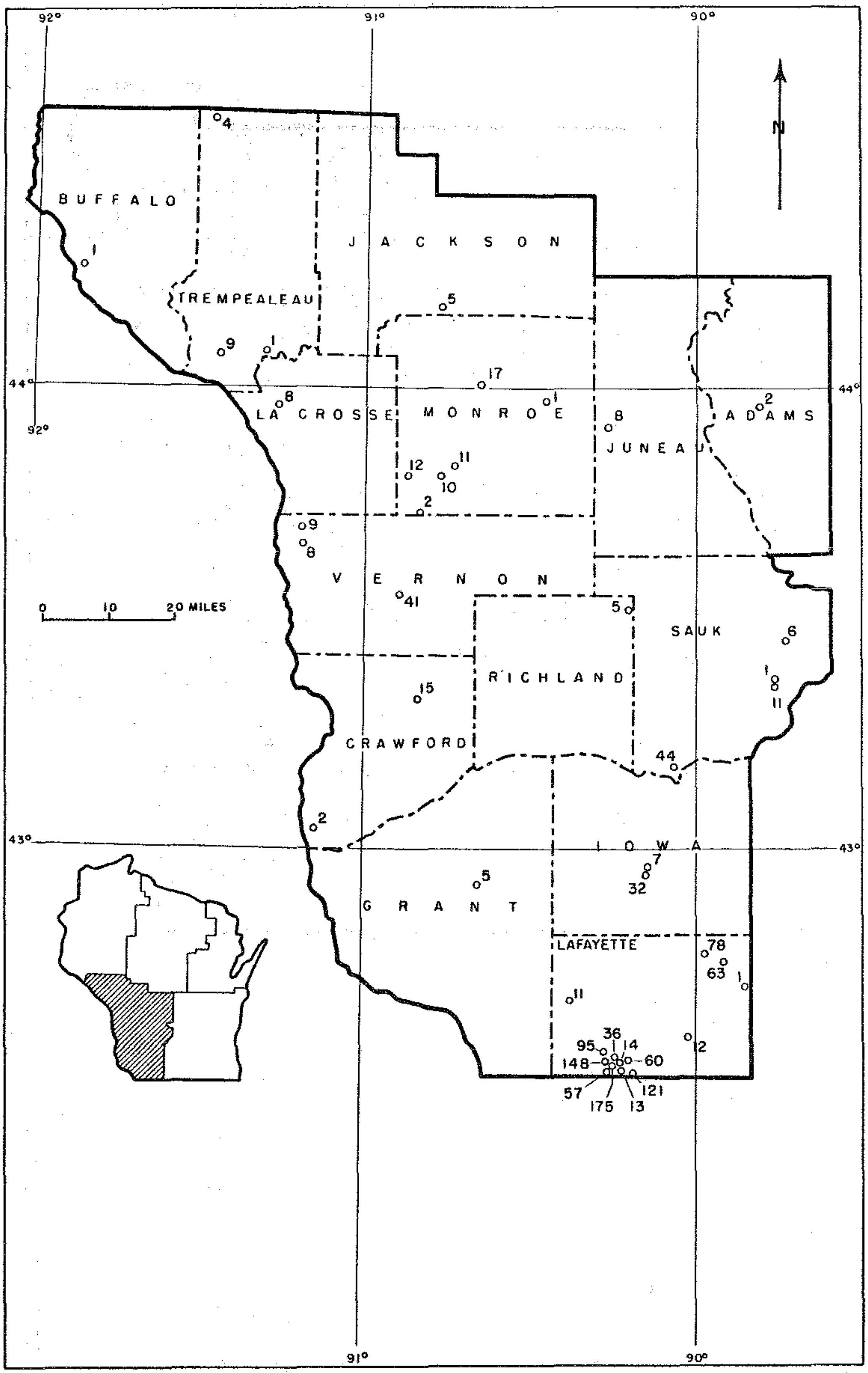


Figure 1d.--Map of southwestern Wisconsin showing locations of observation wells in 1957.

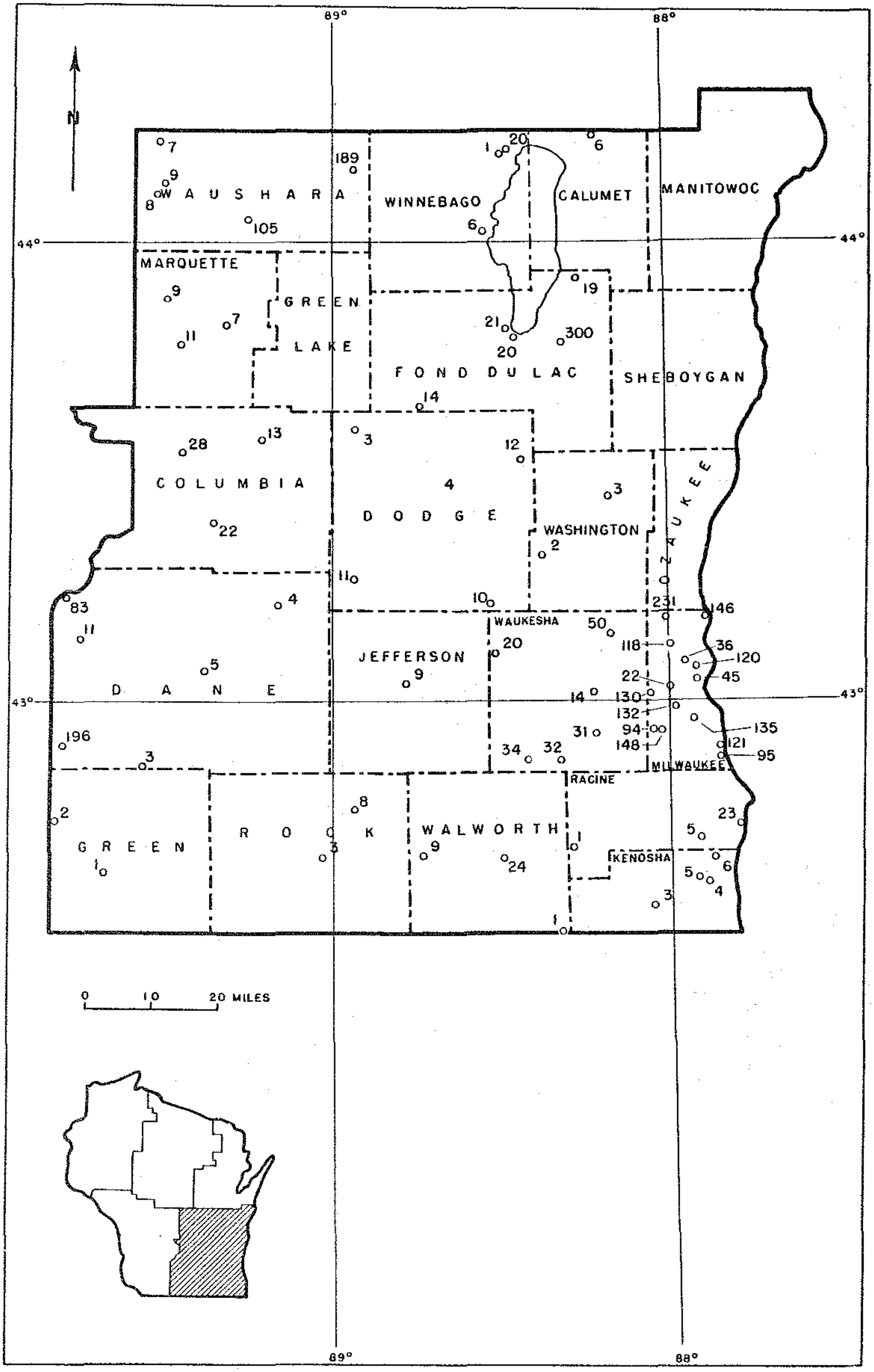


Figure 1e.--Map of southeastern Wisconsin showing locations of observation wells in 1957.

Table 1.--Observation wells in Wisconsin, by principal geologic formation

County	Well	County	Well

Precambrian rocks:

Ashland	As-46/4W/6-1	Florence	Fc-40/18/28-3
Dodge	Dg-9/13/1-11	Portage	Pt-24/6/2-82

Cambrian system:

Barron	Br-33/13W/21-46	Milwaukee	Ml-5/22/24-95 1/
Brown	Bn-23/20/22-11	Milwaukee	Ml-6/21/32-94 1/
Brown	Bn-24/19/35-16	Milwaukee	Ml-7/21/34-22 1/
Brown	Bn-24/20/24-76 1/	Monroe	Mo-15/4W/34-2
Brown	Bn-24/20/25-9	Monroe	Mo-16/4W/32-12
Brown	Bn-24/20/29-51	Monroe	Mo-18/2W/29-17
Brown	Bn-24/21/13-72	Oconto	Oc-28/22/19-1
Brown	Bn-25/22/14-80	Outagamie	Ou-21/17/15-29
Buffalo	Bf-21/12W/29-1	Outagamie	Ou-21/18/24-2
Calumet	Ca-20/19/2-6 1/	Outagamie	Ou-24/17/8-170
Chippewa	Ch-28/5W/1-38	Polk	Pk-32/17W/7-75
Chippewa	Ch-29/5W/31-27	Racine	Ra-3/22/21-5 1/
Clark	Ck-26/3W/4-1	Racine	Ra-3/23/9-23 3/
Columbia	Co-11/9/36-22	Richland	Ri-12/2/12-5
Columbia	Co-12/9/5-28	Rock	Ro-2/12/2-3 1/
Columbia	Co-13/11/29-13	Rock	Ro-4/13/27-8
Crawford	Cr-7/7W/36-2	St. Croix	SC-28/15W/36-56
Crawford	Cr-10/4W/22-15	St. Croix	SC-29/20W/24-21
Dane	Dn-7/9/23-5	Sauk	Sk-10/6/3-1
Dodge	Dg-11/16/5-4 1/	Sauk	Sk-10/6/15-11
Dodge	Dg-12/17/10-12 1/	Sauk	Sk-11/6/1-6
Dunn	Du-26/13W/31-53	Trempealeau	Tr-19/8W/35-1
Eau Claire	EC-27/9W/27-37	Trempealeau	Tr-24/9W/9-4
Fond du Lac	FL-14/15/32-14	Vernon	Ve-13/4W/31-41
Fond du Lac	FL-15/17/3-20 2/	Vernon	Ve-14/7W/14-9
Iowa	Iw-6/3/28-7	Walworth	Ww-1/18/35-1 1/
Jackson	Ja-20/3W/30-5	Walworth	Ww-2/17/4-24
Jefferson	Je-7/14/25-9	Waukesha	Wk-6/19/2-14 1/
Juneau	Ju-17/2/21-8	Waukesha	Wk-7/17/5-20 1/
Kenosha	Ke-2/22/11-6	Waupaca	Wp-21/13/25-2
LaCrosse	LC-17/7W/7-8	Waushara	Ws-20/13/34-189
Marinette	Mt-30/23/19-5 1/	Winnebago	Wi-20/17/20-1 3/
Marinette	Mt-30/24/6-1	Winnebago	Wi-20/17/22-20
Marquette	Mq-16/8/12-9		

1/ Also obtains water from St. Peter sandstone.
2/ Also obtains water from Platteville formation and Galena dolomite.
3/ Also obtains water from Niagara dolomite.

Table 1.--Observation wells in Wisconsin, by principal geologic formation, cont'd.

County	Well	County	Well
Ordovician system:			
Prairie du Chien group:			
Grant	Gr-5/2W/6-5	Shawano	Sh-26/16/2-2
Lafayette	Lf-3/5/25-1	St. Croix	SC-28/19W/31-2
Shawano	Sh-25/17/28-4	St. Croix	SC-31/16W/29-94
St. Peter sandstone:			
Brown	Bn-24/20/2-43	Lafayette	Lf-2/4/33-12 2/
Brown	Bn-25/21/7-78	Lafayette	Lf-4/4/35-78
Dane	Dn-5/6/17-196	Milwaukee	Ml-6/21/11-132 3/
Dane	Dn-5/8/32-3	Milwaukee	Ml-7/21/12-36
Dane	Dn-9/11/34-4	Outagamie	Ou-21/19/4-5
Dodge	Dg-13/13/15-3	Outagamie	Ou-23/19/30-125
Door	Dr-26/23/22-11 4/	Pepin	Pp-23/15W/21-17
Fond du Lac	FL-17/19/30-19	Pierce	Pi-26/17W/7-51
Green	Gn-3/6/18-2	Washington	Wn-11/19/11-3 3/
Kenosha	Ke-1/21/8-3 2/	Waukesha	Wk-5/18/19-34
Lafayette	Lf-1/1/27-182	Winnebago	Wi-18/16/23-6

4/ Also obtains water from sandstone of Cambrian age.

County	Well	County	Well
Platteville formation and Galena dolomite:			
Dodge	Dg-9/17/30-10	Lafayette	Lf-1/2/34-14
Fond du Lac	FL-16/17/33-21	Lafayette	Lf-1/2/35-121
Green	Gn-2/7/21-1	Lafayette	Lf-2/1/4-11
Iowa	Iw-6/3/32-32	Racine	Ra-3/19/32-1
Lafayette	Lf-1/2/17-95	Shawano	Sh-26/16/2-3
Lafayette	Lf-1/2/20-148	Shawano	Sh-26/18/30-1
Lafayette	Lf-1/2/22-36	Walworth	Ww-3/15/33-9
Lafayette	Lf-1/2/23-60	Washington	Wn-10/18/20-2
Lafayette	Lf-1/2/28-175	Waukesha	Wk-5/19/2-31
Lafayette	Lf-1/2/33-57		

Table 1.--Observation wells in Wisconsin, by principal geologic formation, cont'd.

Maquoketa shale:

County	Well	County	Well
Lafayette	Lf-1/2/34-13	Waukesha	Wk-5/18/23-32

Silurian system:

Niagara dolomite:

County	Well	County	Well
Door	Dr-27/26/8-5	Milwaukee	Ml-7/22/17-120
Door	Dr-29/27/30-7	Milwaukee	Ml-7/22/29-45
Fond du Lac	FL-15/18/11-300	Milwaukee	Ml-8/21/3-231
Kenosha	Ke-2/22/27-4	Milwaukee	Ml-8/21/35-118
Milwaukee	Ml-5/22/13-121	Milwaukee	Ml-8/22/4-146
Milwaukee	Ml-6/21/6-130	Waukesha	Wk-8/20/19-50
Milwaukee	Ml-6/21/32-148		

Table 1.--Observation wells in Wisconsin, by principal geologic formation, cont'd.

Quaternary system:

County	Well	County	Well
Adams	Ad-17/6/5-2	Monroe	Mo-17/1W/1-1
Ashland	As-43/4W/32-6	Oneida	On-36/9/9-24
Barron	Br-34/11W/25-62	Oneida	On-37/6/27-23
Burnett	Bt-39/16W/17-2	Oneida	On-39/8/18-22
Burnett	Bt-41/15W/21-4	Outagamie	Ou-22/16/20-95
Chippewa	Ch-29/8W/18-11	Outagamie	Ou-23/17/8-169
Dane	Dn-8/6/26-11	Polk	Pk-35/17W/8-40
Dane	Dn-9/6/28-83	Polk	Pk-36/19W/25-49
Douglas	Ds-47/10W/23-1	Portage	Pt-21/8/10-36
Eau Claire	EC-26/6W/32-13	Portage	Pt-21/9/29-43
Florence	Fc-38/15/31-4	Portage	Pt-22/7/35-35
Forest	Fr-41/14/18-2	Portage	Pt-23/7/34-34
Iron	Ir-42/4/12-2	Portage	Pt-24/8/2-40
Iron	Ir-45/1/2/5	Portage	Pt-24/10/28-15
Kenosha	Ke-2/22/20-5	Price	Pr-35/2/7-7
Lafayette	Lf-3/5/8-63	Price	Pr-40/1W/24-6
Langlade	La-31/10/35-9	Price	Pr-40/3/1-8
Langlade	La-31/11/7-26	Rusk	Ru-33/8W/11-37
Langlade	La-31/11/20-64	Rusk	Ru-35/3W/14-89
Langlade	La-31/11/20-118	St. Croix	SC-31/16W/8-95
Langlade	La-31/11/29-200	Sauk	Sk-8/4/7-44
Langlade	La-31/12/8-27	Sawyer	Sw-41/9W/28-7
Langlade	La-32/11/32-44	Taylor	Ta-31/1/28-6
Lincoln	Ln-34/6/36-25	Taylor	Ta-31/4W/24-1
Marathon	Mr-26/3/33-7	Trempealeau	Tr-19/9W/33-9
Marathon	Mr-27/9/31-28	Vernon	Ve-14/7W/26-8
Marathon	Mr-28/2/18-8	Vilas	Vi-40/5/5-25
Marathon	Mr-29/3/24-27	Vilas	Vi-40/10/10-21
Marathon	Mr-30/10/25-1	Vilas	Vi-41/10/9-3
Marinette	Mt-35/22/18-9	Washburn	Wb-39/12W/31-1
Marinette	Mt-37/20/34-7	Waushara	Ws-18/10/1-105
Marquette	Mq-15/9/17-11	Waushara	Ws-19/8/15-8
Marquette	Mq-16/10/33-7	Waushara	Ws-19/8/15-9
Milwaukee	Ml-6/22/20-135	Waushara	Ws-20/8/10-7
Monroe	Mo-15/3W/5-10	Wood	Wd-22/6/16-1
Monroe	Mo-16/3W/27-11	Wood	Wd-23/4/2-29

Table 2.--Highest and lowest water levels of record in observation wells in Wisconsin.

(Water levels are in feet below or above(+) land surface datum)

County	Well	Records available	Highest water level	Date	Lowest water level	Date
Adams	Ad-17/6/5-2	1952-57	12.96	8-18-52	16.69	5-3-54
Ashland	As-43/4W/32-6	1957				
Ashland	As-46/4W/6-1	1943-45, 1947-55	1.05	4-10-50 3-23-53	4.15	9-27-48
Barron	Br-33/13W/21-46	1956-57	33.79	10-22-56	34.59	12-11-57
Barron	Br-34/11W/25-62	1956-57	40.77	10-25-56	41.45	12-12-57
Brown	Bn-23/20/22-11	1946-57	85.32	5-12-47	170.59	8-22-57
Do.	Bn-24/19/35-16	1947-57	3.98	5-13-47	44.37	11-29-56
Do.	Bn-24/20/2-43	1948-57	7.72	3-18-48	65.28	8-20-57
Do.	Bn-24/20/24-76	1950-57	122.74	12-23-57	248.97	8-30-55
Do.	Bn-24/20/25-9	1947-57	166.42	12-29-57	351.83	8-25-55
Do.	Bn-24/20/29-51	1948-57	111.96	1-28-53	131.29	10-26-55
Do.	Bn-24/21/13-72	1949-55, 1956-57	333.0	2-8-50	281.0	11-28-56
Do.	Bn-25/21/7-78	1949-57	+20.5	9-22-49	+1.8	8-6-57
Do.	Bn-25/22/14-80	1949-57	130.36	10-6-49	158.11	11-6-57
Buffalo	Bf-21/12W/29-1	1947-57	28.48	6-4-52	31.01	1-12-49
Burnett	Bt-39/16W/17-2	1937-57	31.16	7-20-52	34.99	3-25-51
Do.	Bt-41/15W/21-4	1957				
Calumet	Ca-20/19/2-6	1952-57	172.36	4-7-53	188.50	9-24-56
Chippewa	Ch-28/5W/1-38	1956-57	17.42	4-17-57	18.71	12-12-57
Do.	Ch-29/5W/31-27	1956-57				
Do.	Ch-29/8W/18-11	1953-57	38.43	8-11-54	41.80	12-13-57
Clark	Ck-26/3W/4-1	1953-57	64.84	8-13-56	67.80	7-7-54
Columbia	Co-11/9/36-22	1949-57	50.92	10-13-55	56.30	8-5-55
Do.	Co-12/9/5-28	1949, 1951-55, 1957	0.13	4-25-51	2.66	2-6,7-50
Do.	Co-13/11/29-13	1949-57	53.69	3-11-52	60.47	11-3-53
Crawford	Cr-7/7W/36-2	1953-57	+15.	4-21-53	+11.5	11-13-57
Do.	Cr-10/4W/22-15	1957				
Dane	Dn-5/6/17-196	1957				

Table 2.--Highest and lowest water levels of record in observation wells in Wisconsin, cont'd.

(Water levels are in feet below or above(+) land surface datum)

County	Well	Records available	Highest water level	Date	Lowest water level	Date
Dane	Dn-5/8/32-3	1946-57	55.26	7-18-51	68.13	11-13-57
Do.	Dn-7/9/23-5	1946-54, 1956-57	83.60	7-13-54	105.28	7-21-46
Do.	Dn-8/6/26-11	1957				
Do.	Dn-9/6/28-83	1957				
Do.	Dn-9/11/34-4	1946-57	26.64	3-19-52	50.04	3-29-50
Dodge	Dg-9/13/1-11	1946-57	16.24	3-27-52	49.87	3-29,30-50
Do.	Dg-9/17/30-10	1946-57	8.09	5-25-51	11.88	10-29-57
Do.	Dg-11/16/5-4	1947-57	114.10	4-24-55	122.57	9-18-53
Do.	Dg-12/17/10-12	1946-57	38.41	5-3-48	75.80	7-26-50
Do.	Dg-13/13/15-3	1946-57	2.80	4-13-51	13.49	10-13-48
Door	Dr-26/23/22-11	1950-57	42.16	9-20-50	60.63	11-6-57
Do.	Dr-27/26/8-5	1946-57	+2.40	4-12-51	19.24	8-7-57
Do.	Dr-29/27/30-7	1946-57	12.18	5-24-47	52.40	12-7-49
Douglas	Ds-47/10W/23-1	1937-41, 1944-57	25.51	3-3-53	29.59	7-29-39
Dunn	Du-26/13W/31-53	1956-57	33.68	12-11-57	34.52	8-21-57
Eau Claire	EC-26/6W/32-13	1951-57	10.86	4-26-56	14.98	11-29-51
Do.	EC-27/9W/27-37	1956-57	74.67	4-19-57	75.80	12-13-57
Florence	Fc-38/15/31-4	1957				
Do.	Fc-40/18/28-3	1957				
Fond du Lac	FL-14/15/32-14	1953-55, 1957	26.84	11-22-54	36.72	9-19-57
Do.	FL-15/17/3-20	1950-57	61.77	4-22-52	85.09	7-29-54
Do.	FL-15/18/11-300	1956-57	2.03	9-6-56	7.46	11-5-57
Do.	FL-16/17/33-21	1950-57	27.28	6-2-53	35.86	8-31-54
Do.	FL-17/19/30-19	1948-57	132.75	1-8-48	147.44	3-14-55
Forest	Fr-41/14/18-2	1948-57	7.96	4-29-54	11.88	5-16-49
Grant	Gr-5/2W/6-5	1946-57	8.90	7-16-47	17.33	2-28-50
Green	Gn-2/7/21-1	1946-57	50.33	5-20-48	68.63	1-21-57
Do.	Gn-3/6/18-2	1946-57	123.91	1-14-53	137.47	7-23-57

Table 2.--Highest and lowest water levels of record in observation wells in Wisconsin, cont'd.

(Water levels are in feet below or above(+) land surface datum)

County	Well	Records available	Highest water level	Date	Lowest water level	Date
Iowa	Iw-6/3/28-7	1957				
Do.	Iw-6/3/32-32	1957				
Iron	Ir-42/4/12-2	1957				
Do.	Ir-45/1/2-5	1957				
Jackson	Ja-20/3W/30-5	1953-57	16.99	8-21-54	21.38	2-21-57
Jefferson	Je-7/14/25-9	1946-57	15.16	2-28-49	49.59	8-29-57
Juneau	Ju-17/2/21-8	1949-57	5.12	8-21-54	9.80	3-3-50
Kenosha	Ke-1/21/8-3	1946-57	95.80	12-3-47	127.87	10-31-57
Do.	Ke-2/22/11-6	1946-57	21.10	12-3-47	56.40	10-30-57
Do.	Ke-2/22/20-5	1946-57	.41	5-10-48	20.14	11-13-57
Do.	Ke-2/22/27-4	1946-57	73.70	4-16-52	83.40	8-7-56
La Crosse	LC-17/7W/7-8	1953-57	47.0	5-10-55	55.0	6-30-53
Lafayette	Lf-1/2/17-95	1953-57	78.98	11-23-54	84.51	12-18-56 1-23-57
Do.	Lf-1/2/20-148	1955-57	62.34	11-18-57	147.40	3-1,2-55
Do.	Lf-1/2/22-36	1951-57	249.0	10-26-51	319.43	12-31-57
Do.	Lf-1/2/23-60	1952-57	0.00	7-13-57	106.20	2-12,13-55
Do.	Lf-1/2/28-175	1955	298.37	5-27-55	321.49	12-30,31-57
Do.	Lf-1/2/33-57	1952-57	63.67	4-29-52	94.74	12-16-57
Do.	Lf-1/2/34-13	1951-57	6.28	7-23-57	20.36	1-25-54
Do.	Lf-1/2/34-14	1951-57	129.25	8-6-51	186.72	2-2-55
Do.	Lf-1/2/35-121	1953-57	69.17	7-1-55	78.72	4-14-57
Do.	Lf-2/1/4-11	1947-57	23.40	7-16-47	37.69	4-24-57
Do.	Lf-2/4/33-12	1947-57	20.17	6-16-47	39.26	2-14-56
Do.	Lf-3/5/8-63	1952-57	1.06	2-11-54	3.95	7-20-54
Do.	Lf-3/5/25-1	1946-57	16.00	6-15-47	23.44	8-8-56
Do.	Lf-4/4/35-78	1953-57	8.52	4-21-55	19.49	2-5-57

Table 2.--Highest and lowest water levels of record in observation wells in Wisconsin, cont'd.

(Water levels are in feet below or above(+) land surface datum)

County	Well	Records available	Highest water level	Date	Lowest water level	Date
Langlade	La-31/10/35-9	1948-57	10.29	7-1-52	15.15	3-5-51
Do.	La-31/11/7-26	1944-57	3.42	6-2-45	10.98	1-5-54
Do.	La-31/11/20-64	1948-57	12.84	5-12-52	16.46	1-31-49
Do.	La-31/11/20-118	1942-57	6.88	7-19-43	13.84	2-28-49
Do.	La-31/11/29-200	1948-57	+1.03	3-23-53	6.82	2-22-51
Do.	La-31/12/8-27	1948, 1952-57	79.51	6-24-48	84.11	7-1-52
Do.	La-32/11/32-44	1948-57	20.53	7-1-52	24.07	3-22-50
Lincoln	Ln-34/6/36-25a	1944-57	7.65	7-22-52	9.86	8-20-57
Marathon	Mr-26/3/33-7	1950-57	16.92	6-12-50	32.36	12-17-57
Do.	Mr-27/9/31-28	1944-57	17.30	9-10-45	24.84	3-26-51
Do.	Mr-28/2/18-8	1953-57	1.42	4-8-53	6.20	11-19-53
Do.	Mr-29/3/24-27	1944-57	2.76	6-13-55	9.98	4-5-50
Do.	Mr-30/10/25-1	1948-57	31.47	4-30-48	38.30	11-30-57
Marinette	Mt-30/23/19-5	1947-57	14.28	12-26-57	28.25	8-20-55
Do.	Mt-30/24/6-1	1946-57	4.98	4-27-48	44.33	8-8-57
Do.	Mt-35/22/18-9	1950-57	7.67	4-18-51 5-3-51 6-1-51	10.67	10-31-52
Do.	Mt-37/20/34-7	1939-57	19.37	4-27,30-39	23.26	11-2-48
Marquette	Mq-15/9/17-11	1950-57	0.57	5-3-54	3.88	10-13-55
Do.	Mq-16/8/12-9	1949-57	15.06	5-20-52	17.38	5-15-56
Do.	Mq-16/10/33-7	1949-57	30.78	5-20-52	34.90	4-14-56
Milwaukee	Ml-5/22/13-121	1946-57	56.46	8-9-46	68.42	12-24-57
Do.	Ml-5/22/24-95	1952-57	116.15	5-5-52	132.15	10-30-57
Do.	Ml-6/21/6-130	1946-57	55.52	6-3-47	65.69	7-30-57
Do.	Ml-6/21/11-132	1946-57	190.96	6-5-47	264.25	11-17-57
Do.	Ml-6/21/32-94	1946-57	199.97	7-10-46	261.12	10-30-57
Do.	Ml-6/21/32-148	1946-57	25.44	5-3-51	34.85	12-31-56

Table 2.--Highest and lowest water levels of record in observation wells in Wisconsin, cont'd.

(Water levels are in feet below or above(+) land surface datum)

County	Well	Records available	Highest water level	Date	Lowest water level	Date
Milwaukee	Ml-6/22/20-135	1946-57	6.54	4-7-48	12.06	12-27-46
Do.	Ml-7/21/12-36	1946-57	134.26	6-25-47	213.39	9-1-55
Do.	Ml-7/21/34-22	1939-57	141.	4-39	326.	11-57
Do.	Ml-7/22/17-120	1946-49, 1951-57	81.82	5-20-46	102.85	10-3-55
Do.	Ml-7/22/29-45	1946-57	42.50	3-7-56	154.93	7-29-49
Do.	Ml-8/21/3-231	1949-57	8.86	4-21-52	12.97	11-2-53
Do.	Ml-8/21/35-118	1946-57	25.11	4-21-52	48.00	1-30-57
Do.	Ml-8/22/4-146	1946-57	58.70	6-20-46	79.46	7-30-57
Monroe	Mo-15/3W/5-10	1934-57	1.80	4-27-51	11.09	8-27-49
Do.	Mo-15/4W/34-2	1934-57	5.06	6-26-52	15.83	3-11-40
Do.	Mo-16/3W/27-11	1934-57	3.90	6-29-47	7.53	6-7-50
Do.	Mo-16/4W/32-12	1934-57	26.61	4-21-53	28.03	2-5-41
Do.	Mo-17/1W/1-1	1947-57	1.39	3-28-52	5.72	9-29-49
Do.	Mo-18/2W/29-17	1949-57	1.78	7-1-52	6.56	4-15-57
Oconto	Oc-28/22/19-1	1946-57	Flowing	12-3-47	17.25	8-22-46
				1-5-48		
				9-22-49		
				12-8-49		
				7-10-51		
Oneida	On-36/9/9-24	1944-57	18.89	8-29-51	22.20	3-20-49
Do.	On-37/6/27-23	1944-57	27.31	8-18-52	32.96	7-25-49
Do.	On-39/8/18-22	1944-57	13.04	12-20-51	19.29	4-9-49
Outagamie	Ou-21/17/15-29	1951-57	54.84	11-24-55	61.11	7-21-55
Do.	Ou-21/18/24-2	1946-57	6.44	5-7-47	49.33	8-22-57
Do.	Ou-21/19/4-5	1947-57	18.27	3-29-48	38.77	11-5-57
Do.	Ou-22/16/20-95	1952-57	6.36	4-26-55	10.24	1-8-54
Do.	Ou-23/17/8-169	1953-57	9.22	4-27-55	19.02	7-10-57

Table 2.--Highest and lowest water levels of record in observation wells in Wisconsin, cont'd.

(Water levels are in feet below or above(+) land surface datum)

County	Well	Records available	Highest water level	Date	Lowest water level	Date
Outagamie	Ou-23/19/30-125	1953-57	31.97	4-27-55	38.67	8-24-55
Do.	Ou-24/17/8-170	1953-57	4.84	4-26-55	9.82	3-4-54
Pepin	Pp-23/15W/21-17	1957				
Pierce	Pi-26/17W/7-51	1957				
Polk	Pk-32/17W/7-75	1957				
Do.	Pk-35/17W/8-40	1957				
Do.	Pk-36/19W/25-49	1957				
Portage	Pt-21/8/10-36	1950-57	1.48	4-14-51	6.82	8-16-52
Do.	Pt-21/9/29-43	1950-57	27.53	8-28-52	34.47	2-20-57
Do.	Pt-22/7/35-35	1950-57	0.99	4-9-51	5.95	12-1-52
Do.	Pt-23/7/34-34	1950-57	14.46	7-22,29-51 5-11-52	18.80	4-11-54
Do.	Pt-24/6/2-82	1951-57	0.85	4-2-52	6.44	2-1-54 2-20-57
Do.	Pt-24/8/2-40	1950-57	3.66	5-2-51	11.09	3-2-54
Do.	Pt-24/10/28-15	1950-57	33.50	7-10-52	37.79	10-17-57
Price	Pr-35/2/7-7	1957				
Do.	Pr-40/1W/24-6	1937-57	+0.41	6-29-46	5.67	10-31-48
Do.	Pr-40/3/1-8	1957				
Racine	Ra-3/19/32-1	1946-57	23.10	4-5-56	37.05	9-3-47
Do.	Ra-3/22/21-5	1946-57	109.00	7-29-46	147.94	10-30-57
Do.	Ra-3/23/9-23	1952-57	5.27	8-20-52	22.38	10-30-57
Richland	Ri-12/2/12-5	1953-57	30.20	8-24-54	31.92	3-5-55
Rock	Ro-2/12/2-3	1947-57	54.47	4-16-52	59.07	9-29-48
Do.	Ro-4/13/27-8	1952-57	58.26	12-11-52	69.35	10-31-57
Rusk	Ru-33/8W/11-37	1956-57	13.00	4-18-57	13.80	10-17-56
Do.	Ru-35/3W/14-89	1957				

Table 2.--Highest and lowest water levels of record in observation wells in Wisconsin, cont'd.

(Water levels are in feet below or above(+) land surface datum)

County	Well	Records available	Highest water level	Date	Lowest water level	Date
St. Croix	SC-28/15W/36-56	1957				
Do.	SC-28/19W/31-2	1947-57	46.44	10-17-47	53.34	2-20-57
Do.	SC-29/20W/24-21	1957				
Do.	SC-31/16W/8-95	1957				
Do.	SC-31/16W/29-94	1957				
Sauk	Sk-8/4/7-44	1957				
Do.	Sk-10/6/3-1	1946-57	58.45	5-20-53	85.30	5-11-51
Do.	Sk-10/6/15-11	1948-57	82.06	7-2-53	89.80	8-23-57
Do.	Sk-11/6/1-6	1946-57	+5.79	1-3-53	0.94	3-7-53
Sawyer	Sw-41/9W/28-7	1937-57	14.81	5-8-54	17.31	10-23-48
Shawano	Sh-25/17/28-4	1947-57	3.66	4-10-52	9.07	1-11-56 3-23-56
Do.	Sh-26/16/2-2	1947-57	35.49	6-13-52	54.43	11-7-57
Do.	Sh-26/16/2-3	1947-57	+0.80	4-14-51	16.11	11-11,12, 13-57
Do.	Sh-26/18/30-1	1947-57	53.47	12-6-51	64.60	1-11-56
Taylor	Ta-31/1/28-6	1957				
Do.	Ta-31/4W/24-1	1957				
Trempealeau	Tr-19/8W/35-1	1947-57	133.18	1-13-55	142.39	9-28-49
Do.	Tr-19/9W/33-9	1953-57	49.22	7-11-56	53.39	12-11-57
Do.	Tr-24/9W/9-4	1953-57	13.79	1-13-55	16.78	8-21-57
Vernon	Ve-13/4W/31-41	1957				
Do.	Ve-14/7W/14-9	1934-36, 1939-57	45.47	8-10-54	49.39	4-8-42
Do.	Ve-14/7W/26-8	1939-57	44.00	2-26-44	51.52	1-8-42
Vilas	Vi-40/5/5-25	1957				
Do.	Vi-40/10/10-21	1944-57	12.25	5-31-54	16.86	3-21-49
Do.	Vi-41/10/9-3	1937-42, 1948-57	9.01	7-14-51	12.93	11-23-57
Walworth	Ww-1/18/35-1	1946-57	24.98	5-12-48	32.15	8-24-55
Do.	Ww-2/17/4-24	1952-57	251.16	1-25-54	265.65	1-19-56
Do.	Ww-3/15/33-9	1947-57	73.60	8-21-52	79.61	10-31-57

Table 2.--Highest and lowest water levels of record in observation wells in Wisconsin, cont'd.

(Water levels are in feet below or above(+) land surface datum)

County	Well	Records available	Highest water level	Date	Lowest water level	Date
Washburn	Wb-39/12W/31-1	1948-57	2.83	8-10-53	6.20	5-18-53
Washington	Wn-10/18/20-2	1946-57	29.41	5-5-48	49.91	1-10-50
Do.	Wn-11/19/11-3	1946-57	12.32	12-12-51	19.88	8-14-47
Waukesha	Wk-5/18/19-34	1947-57	32.48	4-16-52	41.05	8-31-55
Do.	Wk-5/18/23-32	1947-57	43.98	8-19-52	49.05	2-23-55
Do.	Wk-5/19/2-31	1947-57	129.02	8-4-52	136.60	12-20-57
Do.	Wk-6/19/2-14	1946-57	249.86	7-6-47	340.69	8-24-57
Do.	Wk-7/17/5-20	1946-57	25.70	7-3-47	35.57	7-29-57
Do.	Wk-8/20/19-50	1952-57	8.85	4-7-52	16.58	10-30-57
Waupaca	Wp-21/13/25-2	1950-57	10.81	4-23-51	15.91	2-23-54
Waushara	Ws-18/10/1-105	1956-57	2.32	5-10-56	5.89	11-7,15-57
Do.	Ws-19/8/15-8	1951-57	7.14	5-11-52	13.02	5-13-57
Do.	Ws-19/8/15-9	1951-57	15.03	5-14-52	19.96	12-31-57
Do.	Ws-20/8/10-7	1950-57	9.71	4-28-52	14.99	4-12-54
Do.	Ws-20/13/34-189	1957				
Winnebago	Wi-18/16/23-6	1950-57	27.25	4-13-51	36.08	10-26-55
Do.	Wi-20/17/20-1	1946-57	38.05	4-16-47	66.15	9-1-55
Do.	Wi-20/17/22-20	1952-54, 1956-57	55.36	11-19-54	88.80	10-23-56
Wood	Wd-22/6/16-1	1950-53, 1957	2.10	7-8-51	7.64	8-22-57
Do.	Wd-23/4/2-29	1944-57	2.86	4-23-51	13.99	2-15-54

Hydrologic data -- water levels, charts from recording gages, hydrographs, chemical analyses and temperatures of water, and logs and other data on wells -- are available for consultation at the Wisconsin Geological and Natural History Survey and the U. S. Geological Survey, 115 and 116 Science Hall, University of Wisconsin, Madison 6, Wisconsin.

A selected bibliography of reports containing information on the geology and ground-water resources of Wisconsin is appended to this report.

The water-level program is planned cooperatively with George F. Hanson, State Geologist, and is under the direct supervision of C.L.R. Holt, Jr., District Geologist of the U. S. Geological Survey in charge of ground-water investigations in Wisconsin.

Climate

The climate of Wisconsin is characterized by warm humid summers and cold winters. The average annual precipitation and mean annual temperature for 1931-55, based on U. S. Weather Bureau records, are shown in figure 2. About two-thirds of the annual precipitation falls during the growing season, which averages 110 to 135 days in the northern part of the state and 135 to 160 days in the southern part (U. S. Dept. of Agriculture, 1941, p. 1191-1200). The average monthly temperature is below freezing 3 to 5 months a year.

Ground Water

Ground water is one phase of the hydrologic cycle, which also includes precipitation, stream flow, evaporation and transpiration by plants. Precipitation, the source of all fresh water, falls principally as rain or snow on the land surface and runs off as surface streams, is evaporated, or seeps into the soil. A part of the water that percolates into the ground replenishes soil moisture and is later evaporated by circulating air in the soil or returned to the atmosphere by the transpiration of plants; a part descends to the zone of saturation and becomes ground water. All openings in the zone of saturation are filled with water, and it is the water in this zone that can be obtained by wells and that flows from springs.

Ground water moves from higher to lower levels and generally, but not necessarily, down the dip of the bedding. Movement of water may be in any direction depending upon differences in head. In order to have continued movement, there must be a change in the quantity of water stored in the aquifer or there must be discharge from the aquifer. Recharge adds water to storage; if no ground water were discharged, the reservoir would soon become full. This situation is avoided by natural discharge through evapotranspiration and flow through seeps and springs to streams and lakes. The rate of movement is dependent upon the hydraulic gradient (rate of change of pressure head per unit of distance of flow at a given point and in a given direction) and the permeability of the aquifer. The permeability of a rock is a measure of its capacity to transmit water under a hydraulic gradient. Permeable rock zones through which ground water moves freely enough to supply wells are called aquifers.

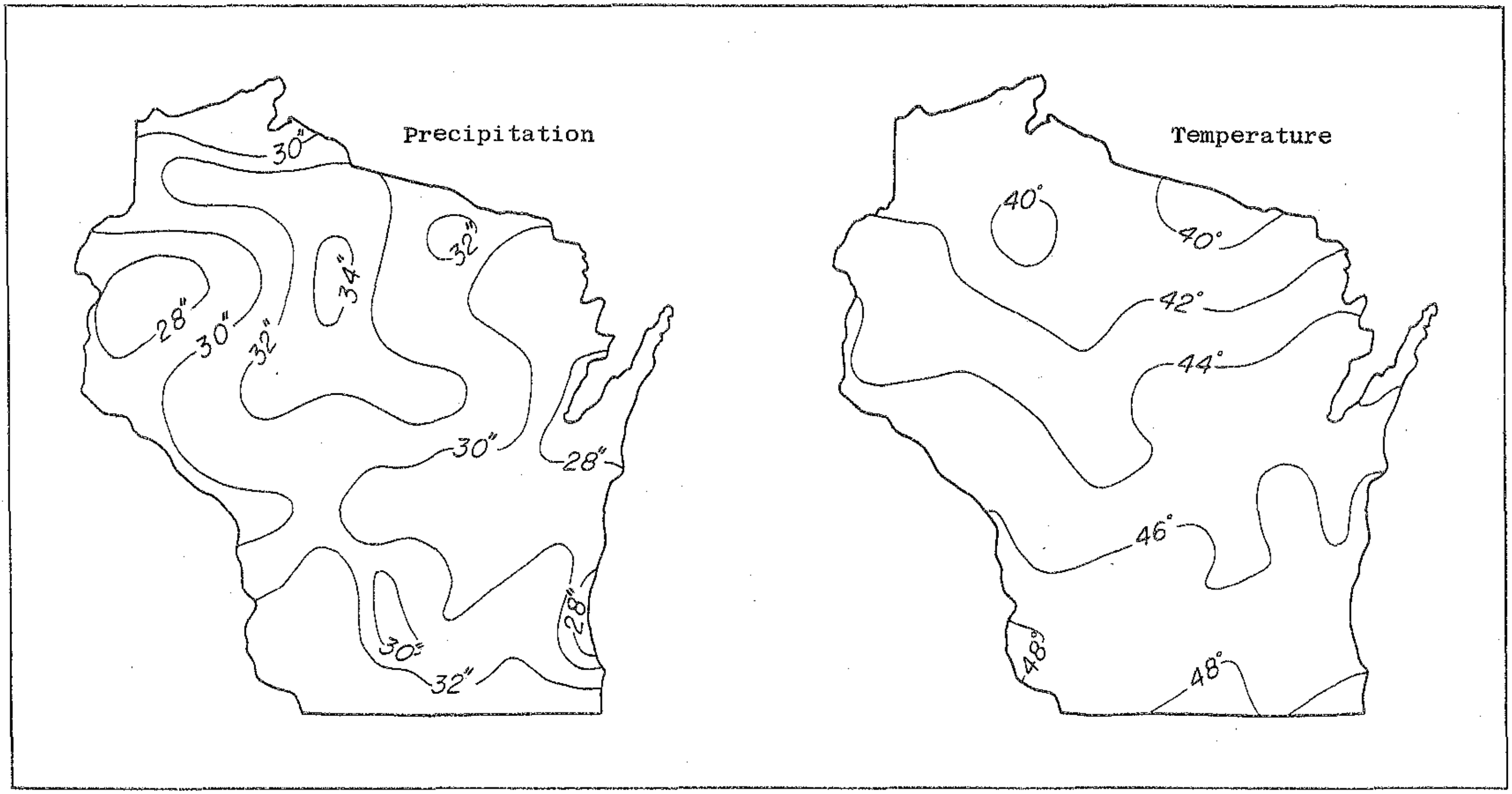


Figure 2.--Map of Wisconsin showing average annual precipitation and mean annual temperature for 1931-55.

The water table is the upper surface of the zone of saturation, except where that surface is formed by a bed of relatively impermeable material which confines the water under artesian pressure. Unconfined water in the zone of saturation moves slowly through the rocks in a direction determined by the slope of the water table. The water table is not a level or stationary surface; variations from place to place and time to time in its shape and altitude occur as a result of such factors as variations in the permeability and structure of the rocks, variations in the rate of withdrawal of water from wells and springs, and variations in precipitation which affect the rate of recharge.

Water in an aquifer under artesian pressure is restricted in direction of movement by relatively impermeable overlying and underlying rocks. Recharge seeps into the aquifer where it is at or near the land surface and moves down gradient to become confined between relatively impermeable rocks.

When a well penetrates a confined aquifer, downdip from its intake area, hydrostatic pressure causes the water to rise above the bottom of the confining layer. The imaginary surface to which water will rise in artesian wells is called the piezometric surface. An artesian well will flow if the piezometric surface is above the land surface.

A discussion of the source, occurrence, movement and use of ground water in Wisconsin are given in Wisconsin Geological Survey Information Circular No. 1, "Some effects of precipitation on ground water in Wisconsin," by William J. Drescher and in Wisconsin Geological Survey Information Circular No. 3, "Ground water in Wisconsin," by William J. Drescher.

Geology

Figure 3 is a geologic map of the State showing the formations that would be exposed if the surficial material were removed. The geologic formations and their water-bearing characteristics are listed in table 3.

The geology of an area influences the occurrence and availability of ground water and the nature of fluctuations of water levels in wells. It affects the topography and, thus, the proportion of runoff and recharge. In general, the runoff will be greater, and the recharge less, in an area of steep hills and well-defined valleys than in a level area or one of gently rolling hills.

The geology determines the permeability of the rocks and their storage capacity. A well sorted sand will generally have more available storage space and be more permeable than a silty and clayey sand or well-cemented sandstone. In limestones or dolomites, the available storage commonly depends upon the amount of solution of the rock that has taken place along fractures, and the permeability is largely controlled by the alignment of fractures. The permeability is generally greater along bedding planes than across the bedding.

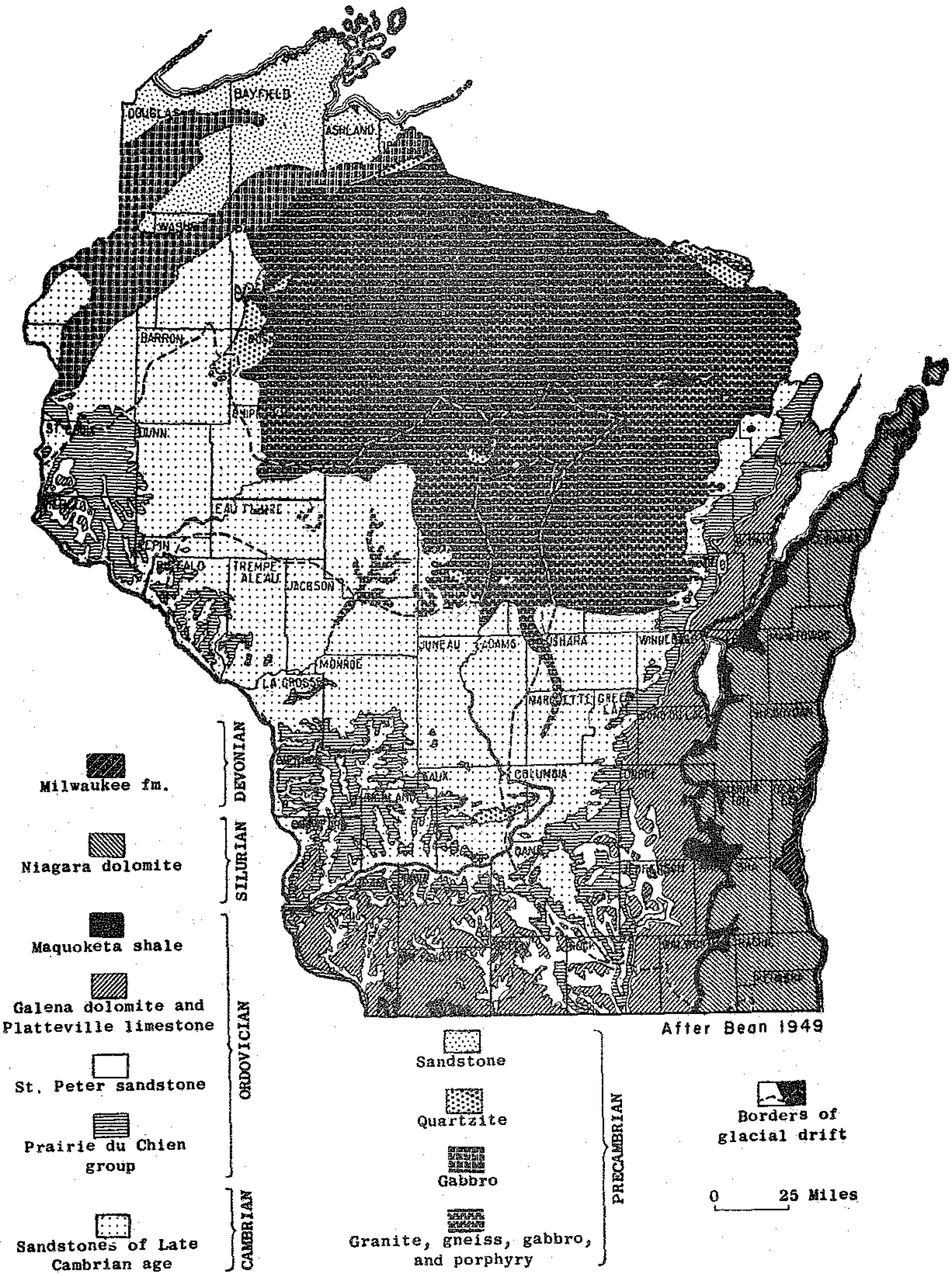


Figure 3.--Map of Wisconsin showing bedrock geology.

Table 3.--Geologic section for the State of Wisconsin

System	Stratigraphic unit	Thickness (feet)	Character	Water-bearing characteristics
Quaternary 1/	Recent alluvium Pleistocene deposits	0-100 0-500	Sand, gravel, peat, muck, marl. Boulder clay, silt, sand, gravel.	Small to large yields from sand and gravel.
Cretaceous or Tertiary 1/	Windrow formation	0-25	Gravel.	Unimportant.
Mississippian 1/	Unnamed unit	0-55	Black carbonaceous shale.	Not water yielding.
Devonian	Milwaukee formation Thiensville formation } 2/	160	Shale, dolomite, limestone.	Yields small amounts of water.
Silurian	Waubakee dolomite Niagara dolomite } 2/	300-825	White to gray dolomite, some coral reefs. Crevices and solution channels locally abundant.	Yields small to moderate amounts of water.
Ordovician	Maquoketa shale Neda formation	50-540	Dolomitic shale. Some beds of dolomite up to 40 feet thick.	Usually not an aquifer. Yields small amounts locally.
	Galena dolomite Decorah shale Platteville formation } 2/	200-350	Dolomite and limestone. Some shale (Decorah). Sandy at base.	Yields small supplies, principally in areas where not overlain by shale.
	St. Peter sandstone	0-330 (Missing in places)	Sandstone, fine to medium grained, white to light gray to pink, dolomitic in places, cross-bedded. Red shale near base in some places.	Yields small to moderate amounts of water.
	Prairie du Chien group (Includes Shakopee dolomite and Oneota dolomite.)	0-200 (Missing in places)	Dolomite. Sandy in some zones.	Yields small to moderate amounts of water.
Cambrian	Trempealeau formation Franconia sandstone Dresbach sandstone Eau Claire sandstone Mount Simon sandstone } 2/	0-1000+	Fine to coarse-grained sandstone, dolomitic, some shale and dolomite beds. Eau Claire and Franconia often shaly.	Yields small to large amounts of water depending upon permeability and thickness. Each formation may be an aquifer but usually considered in aggregate.
Precambrian	3/		Sandstone, quartzite, slate, granite, and other crystalline rocks.	Water in sandstone may be highly mineralized. Other rock types yield small amounts of water where creviced or weathered.

After Drescher (1956, p. 14)

1/ Not shown on map of bedrock geology (fig. 3).
2/ Not separated on map of bedrock geology.
3/ Shown by principal lithology on map of bedrock geology.

Well-numbering system

A system of letters and numbers is used to designate a well (fig. 4). The county designation is derived from the county name (table 4); for example, the prefix Ad indicates the well is in Adams County, the prefix Mo indicates the well is in Monroe County, etc. The township designation within the county is based on the Federal system of land subdivision, and consists of the township, range, and section numbers. The letter W, following the range number indicates the well is located west of the principal meridian; the absence of a letter following the range number indicates the well is located east of the principal meridian (fig. 4). The last numerals are assigned in the order that the wells were inventoried in the county. For example, well Mo-15/4W/34-2 is located in Monroe County; is in township 15 north, range 4 west, section 34; and was the second well inventoried in the county.

Only the serial numbers of the wells are shown on the location maps (figs. 1a-1e) and the township designation is omitted in text references.

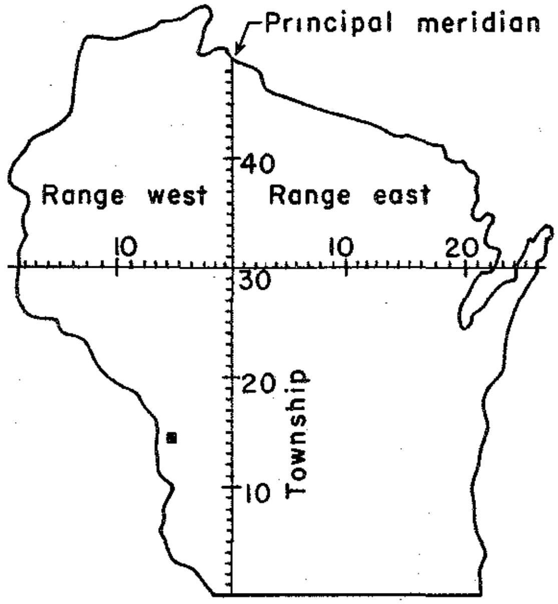
Acknowledgements

Special acknowledgement is made to the Wisconsin Conservation Department for measuring water levels in 14 observation wells. Acknowledgement is also made to the citizens, industries, and local and state agencies for making available many of the observation wells. Appreciation is expressed to local observers who measured water levels and maintained recording gages on a few of the observation wells.

WATER LEVELS AND THEIR SIGNIFICANCE

A fluctuation of water levels in a well indicates that the ground-water reservoir is adjusting to changes in storage because of variations in recharge and discharge. When recharge exceeds discharge, water levels in wells rise, and when discharge exceeds recharge, water levels decline. A knowledge of these fluctuations is necessary to determine water-level trends and changes in ground-water storage. Other factors that affect water levels, such as atmospheric pressure, earthquakes, earth and ocean tide, and changes in surface loading, generally have only a temporary effect and indicate only a slight change in the actual quantity of water stored in the aquifer.

Water levels in wells in artesian (confined) aquifers are many times more sensitive to changes in storage than are water levels in wells in water-table aquifers. A change in water level of many feet in an artesian well may represent the same change in storage as a change in water level of a fraction of a foot in a water-table well.



Federal system of land subdivision in Wisconsin

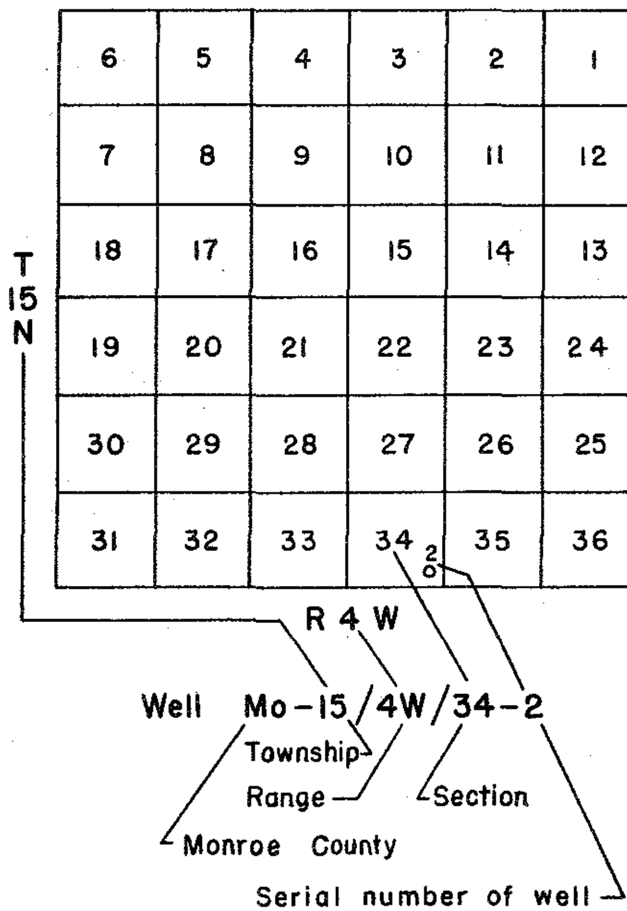


Figure 4.--Well-numbering system in Wisconsin.

Table 4.--Wisconsin county names and prefixes for well-numbering system.

County	Prefix	County	Prefix
Adams	Ad	Marathon	Mr
Ashland	As	Marinette	Mt
Barron	Br	Marquette	Mq
Bayfield	Ba	Milwaukee	Ml
Brown	Bn	Monroe	Mo
Buffalo	Bf	Oconto	Oc
Burnett	Bt	Oneida	On
Calumet	Ca	Outagamie	Ou
Chippewa	Ch	Ozaukee	Oz
Clark	Ck	Pepin	Pp
Columbia	Co	Pierce	Pi
Crawford	Cr	Polk	Pk
Dane	Dn	Portage	Pt
Dodge	Dg	Price	Pr
Door	Dr	Racine	Ra
Douglas	Ds	Richland	Ri
Dunn	Du	Rock	Ro
Eau Claire	EC	Rusk	Ru
Florence	Fc	St. Croix	SC
Fond du Lac	FL	Sauk	Sk
Forest	Fr	Sawyer	Sw
Grant	Gr	Shawano	Sh
Green	Gn	Sheboygan	Sb
Green Lake	GL	Taylor	Ta
Iowa	Iw	Trempealeau	Tr
Iron	Ir	Vernon	Ve
Jackson	Ja	Vilas	Vi
Jefferson	Je	Walworth	Ww
Juneau	Ju	Washburn	Wb
Kenosha	Ke	Washington	Wn
Kewaunee	Kw	Waukesha	Wk
La Crosse	LC	Waupaca	Wp
Lafayette	Lf	Waushara	Ws
Langlade	La	Winnebago	Wi
Lincoln	Ln	Wood	Wd
Manitowoc	Mn		

Recharge and natural discharge

The water levels rise in most wells in Wisconsin in the spring, owing to thawing of the frost zone which permits recharge from melting snow and ice and from rainfall. The levels then gradually decline during the growing season because the natural discharge exceeds the recharge. During this season, vegetation removes moisture from the soil. Soil moisture must be replenished by precipitation before water can recharge the zone of saturation. Small amounts of precipitation cause little, if any, recharge to ground water. Larger amounts of precipitation may cause a rise in water level or temporarily interrupt the normal seasonal decline. Water levels often rise in the fall after vegetation has been killed by the frost. They then decline until the following spring, because natural discharge continues while recharge is retarded or prevented by the frost zone in the soil.

Short-term fluctuations reflect intermittent pumping or local day to day variations in recharge and natural discharge. The fluctuations occur within minutes or at most within a few days and have only a local effect upon water levels and ground-water storage.

Seasonal fluctuations reflect variations in recharge and natural discharge. An example of seasonal fluctuations is shown in the hydrograph of well Ws-7 (fig. 5) in Waushara County. The greatest rise in water levels occurs in the spring owing to snow melt and precipitation. The levels decline during the summer when there is little recharge from precipitation, and when natural discharge by spring flow, evaporation, and transpiration is large. In general, only heavy rains contribute significant recharge with a resultant rise in water level. Water levels continue to decline during the winter, because spring flow continues and recharge is negligible when frost is in the ground.

Other examples of seasonal fluctuations in water levels caused by variations in precipitation are shown in the hydrographs of Door County wells Dr-5 (fig. 39) and Dr-7 (fig. 40), Milwaukee County wells Ml-148 (fig. 91), Ml-45 (Fig. 96), Ml-231 (fig. 97), and Ml-118 (fig. 98), Vilas County well Vi-21 (fig. 141) and Waukesha County well Wk-50 (fig. 154A). The water level in well Dr-7 declines to approximately the same stage each year because the well is near an area of natural discharge.

The stages of most of the lakes in Wisconsin conform closely to the water levels in wells adjacent to the lakes. These lakes exist where the land surface is lower than the water table and are discharge areas for ground water. Transpiration by plants and evaporation from the surface of the lakes on hot windy days may cause significant water losses that result in declining lake levels.

Long-range fluctuations reflect differences between recharge and natural discharge from year to year. Such fluctuations are shown in the hydrographs of most of the wells in this report. The relationship of

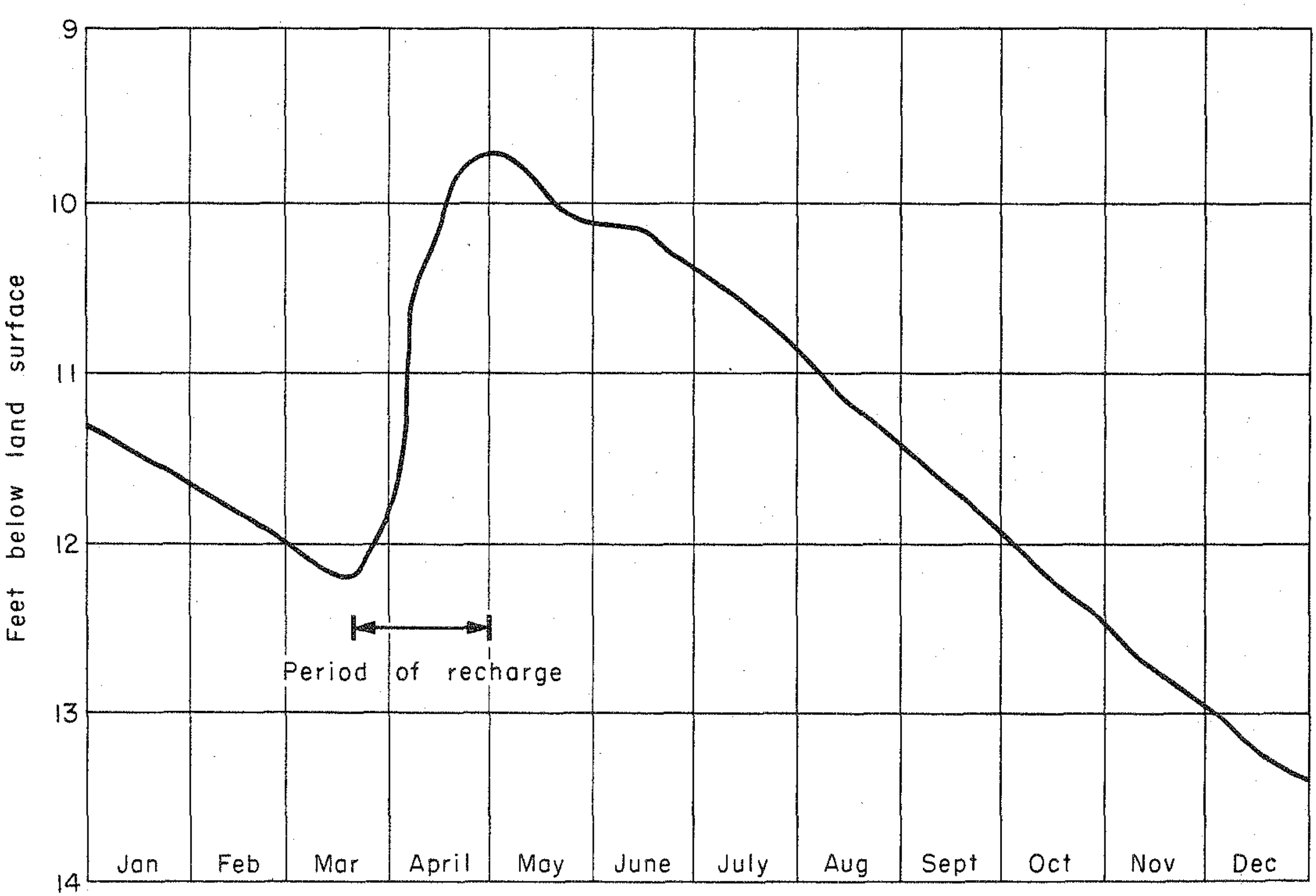


Figure 5.--Hydrograph of well Ws-20/8/10-7, Waushara County for 1952.

precipitation to water levels is well shown in the hydrograph of well Mo-2 in Monroe County (fig. 6). The water level declines during years of below-average precipitation and rises in years of above-average precipitation reflecting changes in storage in the ground-water reservoir. The average level for the 24 years of record (1934-57) is 10.65 feet below lsd (land surface datum). The water level was low when measurements began in 1934, declined to the lowest (18.71) of record in 1935, after which it gradually rose, fluctuating seasonally, to about average in 1943-44 and slightly above average in 1945-48. The level began a persistent decline in the spring of 1949 that continued to the spring of 1951 when it was far below average, after which the level rose sharply, fluctuating slightly, to the highest (5.06) of record in 1952. In 1952-57, the water level declined gradually and was about 4 feet below average at the end of 1957. Yearly fluctuations in water level are generally about 2 to 3 feet, although the fluctuation was about 5 to 7 feet in 1937, 1941, and 1949 and about 4 feet in 1956 and 1957.

Other examples of long-range fluctuations in water levels owing to changes from year to year in recharge and natural discharge are shown in the hydrographs of wells Dn-4 (fig. 32) in Dane County and Gn-1 (fig. 47) in Green County.

The water level in well Dn-4 was near average in 1946-48, declined gradually because of below-average precipitation to the lowest (50.04) of record in 1950, after which it rose steadily in response to recharge from the above-average precipitation to the highest (26.64) of record in 1952. The level declined gradually but remained near average in 1953 and the early part of 1954, recovered to substantially above average in the summer of 1955, after which, because of below-average precipitation, it declined gradually, but persistently, to a near record low in 1957. The decline in water level was temporarily interrupted in the summer of 1957 when above-average precipitation caused a rise of about 4 feet.

The water level in well Gn-1 was slightly below average in 1946, rose in response to above-average precipitation to the highest level (50.33) of record in 1948, declined to near average in 1949-50, rose to substantially above average in 1951-52, after which the water level gradually declined, fluctuating in response to local variations in recharge, to the lowest of record (68.63) in the spring of 1957. The decline in water level was temporarily halted in the spring and summer of 1957 by above-average precipitation which caused a rise in water level of about 10 feet.

In central and southern Wisconsin, water levels in wells generally declined in 1946-49, rose to record-high levels in 1951-52, and declined to record-low or near record-low levels in 1957. In northwestern Wisconsin ground-water levels were average or slightly above average in 1953-57.

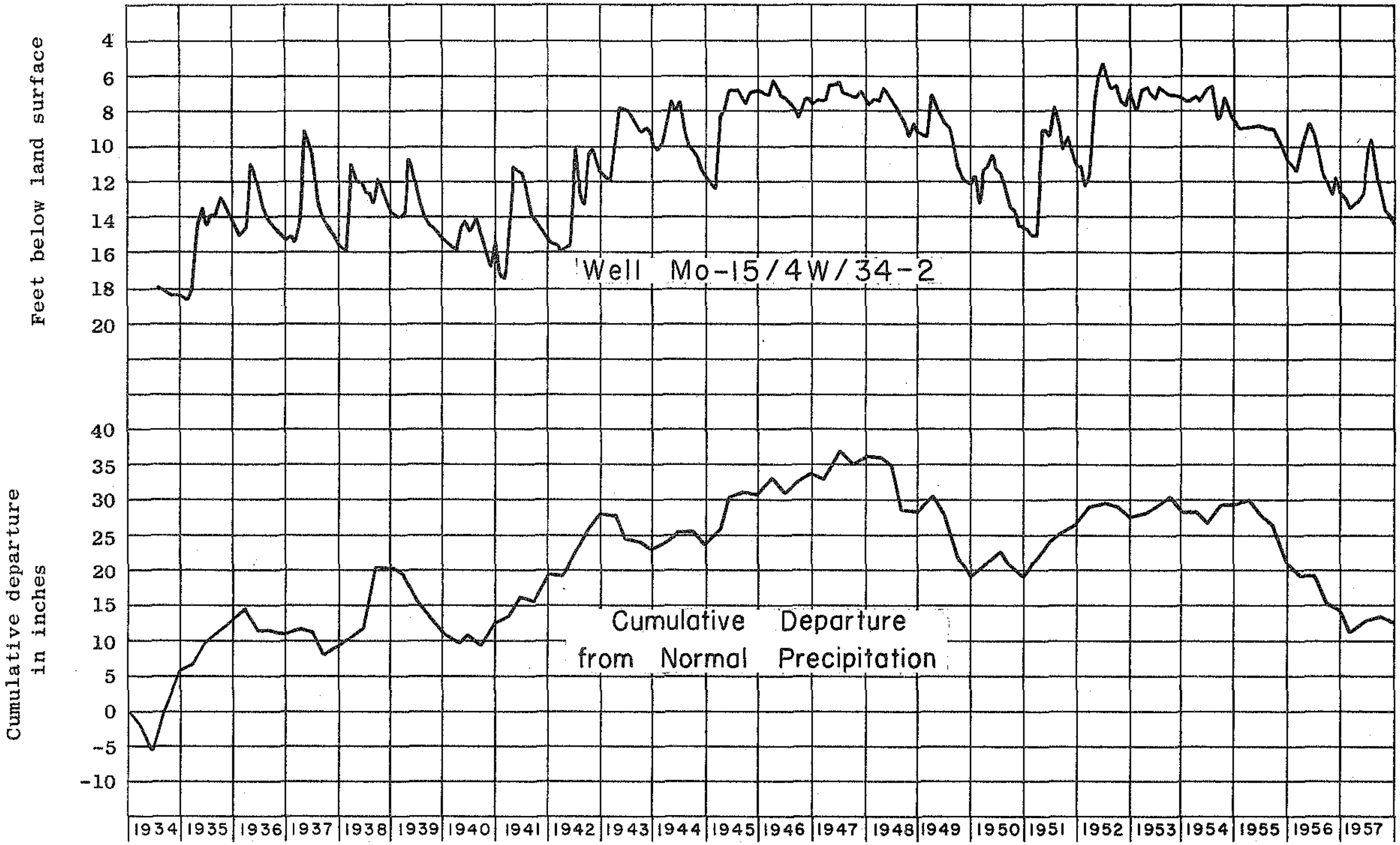


Figure 6.--Hydrograph of well Mo-15/4W/34-2 near Cashton, Monroe County, and graph showing cumulative departure from normal precipitation at LaCrosse, based on U. S. Weather Bureau records.

Artificial discharge

The discharge of water by pumping from wells or pits causes an initial rapid decline in water levels in the pumping well and in nearby wells with a resultant decrease in ground-water storage. As pumping continues the water levels in these wells continue to decline but at a diminishing rate until sufficient recharge water has been intercepted to prevent further decline. When pumping stops the water levels at first rise rapidly and then at a diminishing rate until they are at or near the pre-pumping levels.

The increase in air temperature during the late spring and summer causes increased pumpage of ground water for cooling, domestic use, and irrigation, and results in a local or regional decline in water levels. Similarly the decrease in air temperature during the fall, winter, and early spring months causes a reduction in pumpage and a recovery in water levels. Examples of such fluctuations are shown in the hydrographs of wells Je-9 (fig. 50) in Jefferson County, Mt-1 (fig. 81) in Marinette County, and Oc-1 (fig. 106) in Oconto County.

Large declines in water level have occurred in the heavily-pumped Milwaukee-Waukesha and Green Bay areas and smaller, but significant, declines have been recorded in a few other areas of municipal and industrial pumpage.

The levels in most observation wells in the Green Bay area were at record-low or near record-low stages in August 1957 when the city of Green Bay began using water from Lake Michigan, but the cessation of pumping from the municipal wells after August 1957, resulted in a recovery to record-high or near record-high levels in the spring of 1959.

The increasing pumpage of ground water by industries and municipalities, and for irrigation has created concern about declining water levels. In most of the State, however, serious declines in water levels have not occurred. Even in the areas of heavy pumping much additional ground water can be obtained from properly spaced wells without depleting the supply.

Fond du Lac area

The first deep wells at Fond du Lac were drilled into sandstones of Cambrian age and flowed naturally. Weidman and Schultz (1915, p. 333) reported the static water levels were 25 to 50 feet above the level of Lake Winnebago. As the demands for water for municipal and industrial use increased during later years, additional deep wells were drilled and the wells ceased to flow. Prior to 1945, the municipal wells were concentrated within an area of about one-half square mile near the municipal pumping plant. The wells that have been drilled since 1945 are spaced one-half mile or more apart.

Ground-water conditions in the area are described in a report "Geology and ground-water resources of Fond du Lac County, Wisconsin," by T. G. Newport. Pending publication, this report may be consulted at 116 Science Hall, University of Wisconsin.

The increasing pumpage of water at Fond du Lac, chiefly for municipal use, created a gradually expanding and deepening cone of depression in the piezometric surface. In 1951, nonpumping water levels in well FL-9 (city well 11), near the center of pumping, had declined to as much as 127 feet below land surface; and by 1957, to as much as 175 feet below land surface (fig. 9). The maximum decline in the artesian pressure has been about 200 feet since the first deep wells were drilled in 1885. The extent of the cone of depression in the Fond du Lac area in 1956 is shown in figure 7.

The water level in well FL-8 (city well 10) approximately one mile northeast of the center of pumping, while fluctuating seasonally, declined about 5 feet from 1951 to 1955 (fig. 8). In 1955, the water level declined rapidly about 40 feet to the top of the pump bowls owing to an increase in the rate of pumping. In 1956 and 1957, the rate of pumping was reduced to maintain the pumping level at the top of the pump bowls. The hydrograph for well FL-9 (city well 11) near the center of pumping, shows no net decline in water level in 1951 and 1952 (fig. 9). Since 1952, the water level has declined about 60 feet owing to a high rate of pumping. The hydrograph for well FL-32 (city well 13) approximately one mile north of the center of pumping, shows a decline of about 30 feet from 1951 to 1957 (fig. 10). The rate of pumping gradually declined from 700 gpm (gallons per minute) in 1951 to 550 gpm in 1957. The hydrograph for well FL-59 (city well 14) approximately one mile east of the center of pumping, shows a decline of approximately 45 feet from 1953 to 1956, but had only a small decline in 1956 and 1957 (fig. 11). The small decline of the water levels in 1956 and 1957 is because of a reduction in the rate of pumping. The hydrographs of well FL-20 (fig. 44A) approximately ½ mile northwest of the center of pumping, and well FL-21 (fig. 44B), in North Fond du Lac, show that the water levels rose from 1950 to 1953. Precipitation was above average and temperature was below average during the summer months, resulting in a decrease in pumpage of water for cooling purposes and for sprinkling. From 1953 to 1956, water levels gradually declined in response to an increase in pumpage. Water levels rose in the latter part of 1956 and fluctuated only slightly in 1957 owing to a slight reduction in pumpage.

The hydrograph of well FL-19 (fig. 45A, 13 miles northeast of Fond du Lac shows a decline in water level of 13 feet from 1948 through 1957. This hydrograph correlates closely with hydrographs of wells in the Fond du Lac area (figs. 8-11 and 44).

Green Bay area

The Green Bay area in Brown County includes the cities of Green Bay and DePere, and the towns of Preble, Allouez, Ashwaubenon, and Howard. Ground-water conditions in the Green Bay area are described in U. S. Geological Water-Supply Paper 1190, "Ground-water conditions in artesian aquifers in Brown County, Wisconsin," by W. J. Drescher.

The most important water-bearing beds underlying the area are the sandstones of Cambrian and Ordovician ages. These units were considered by Drescher (1953, p. 9) to form a single aquifer, which he called the sandstone aquifer. Ground-water withdrawals from the sandstone aquifer

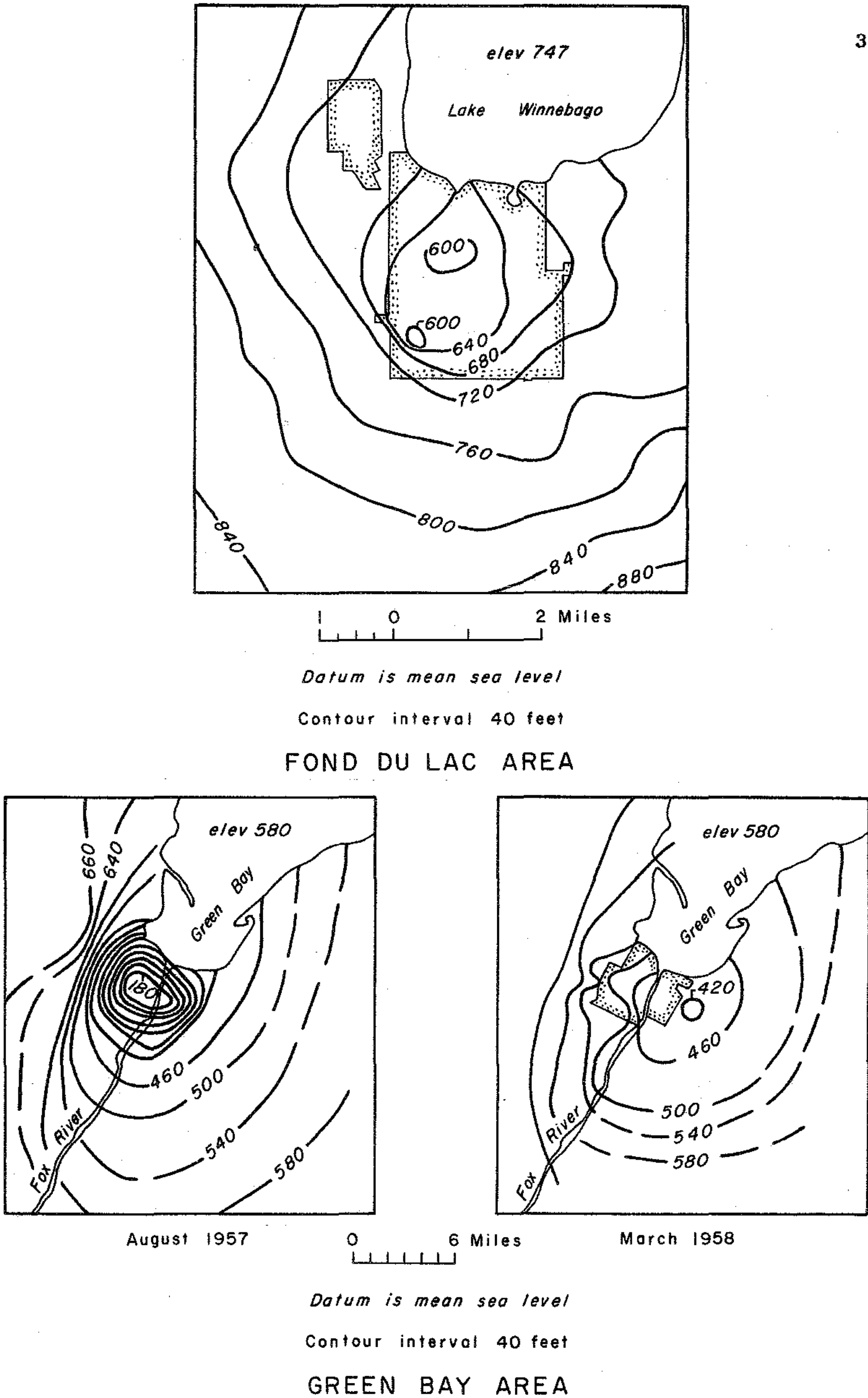


Figure 7.--Maps showing contours on the piezometric surface in the Fond du Lac area in August 1956 and in the Green Bay area in August 1957 and March 1958.

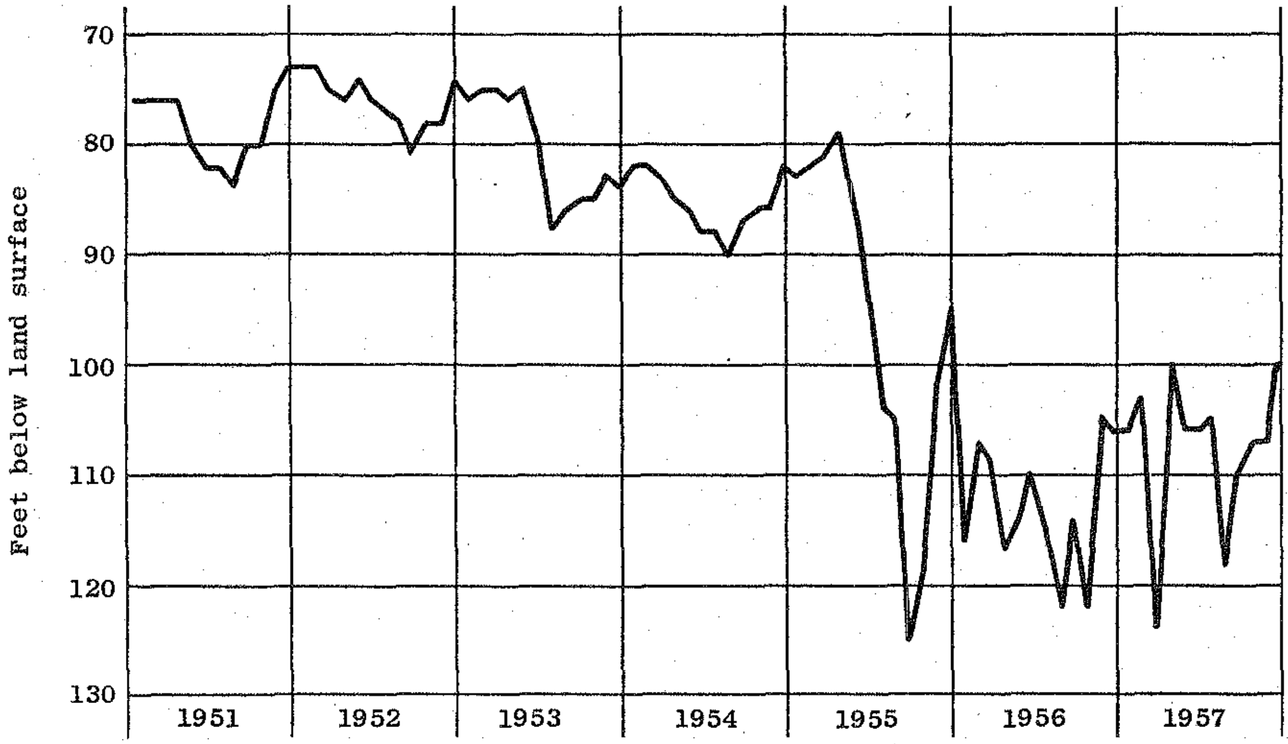


Figure 8.--Hydrograph of well FL-15/17/11-8.

Fond du Lac Co. City of Fond du Lac. NW¼NW¼ sec. 11, T. 15 N., R. 17 E. Drilled public-supply artesian well in sandstone of Cambrian age, diam 20 in, reported depth 885 ft, cased to 108. Lsd, 753 ft above msl. MP, center of airline gage, 2.0 ft above lsd. Measured monthly. All plotted.

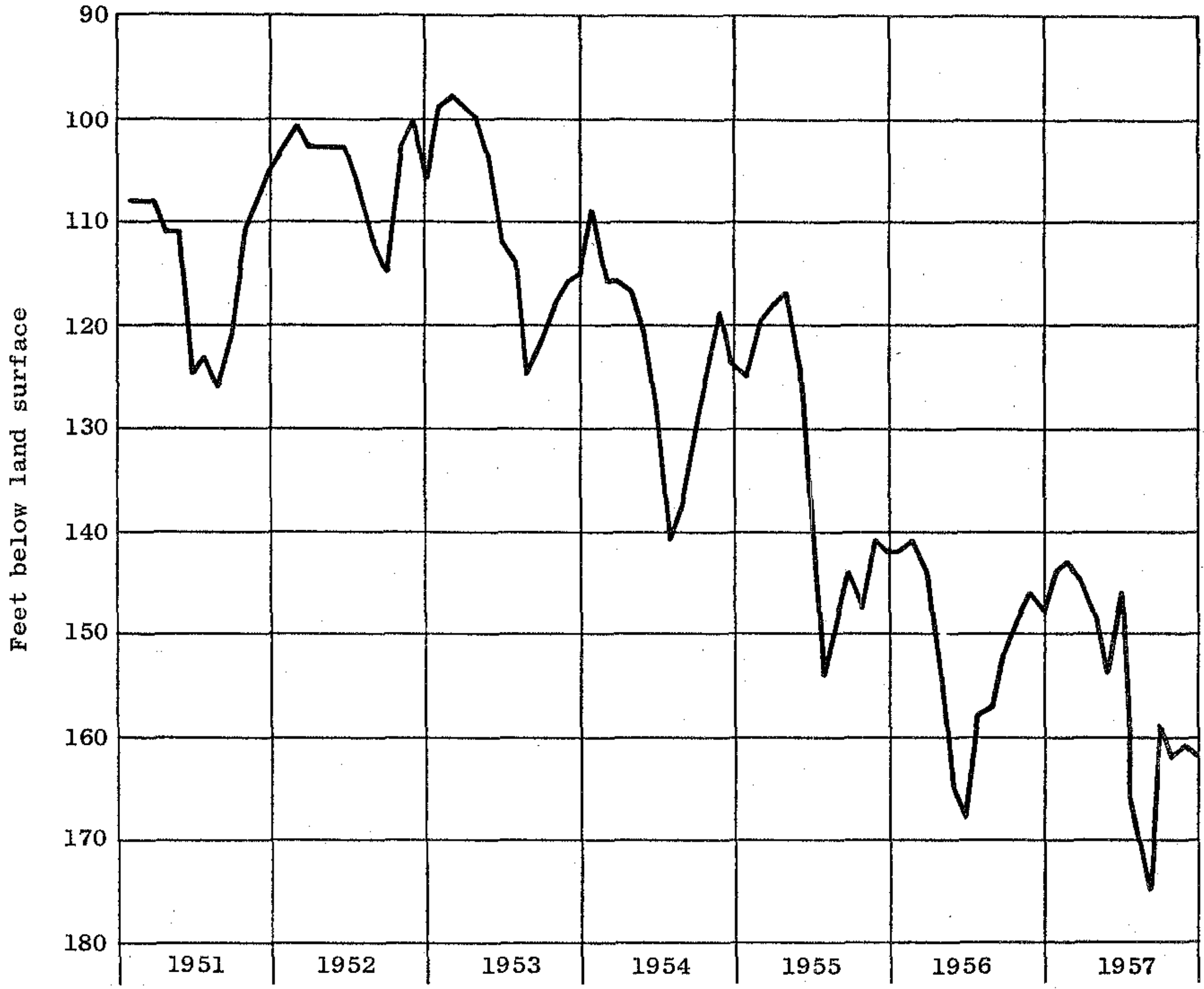


Figure 9.--Hydrograph of well FL-15/17/10-9.

Fond du Lac Co. City of Fond du Lac. $SW\frac{1}{4}NW\frac{1}{4}$ sec. 10, T. 15 N., R. 17 E. Drilled public-supply artesian well in sandstone of Cambrian age, diam 16 in, reported depth 760 ft, cased to 142. Lsd, 752 ft above msl. MP, center of airline gage, 2.0 ft above lsd. Measured monthly. All plotted.

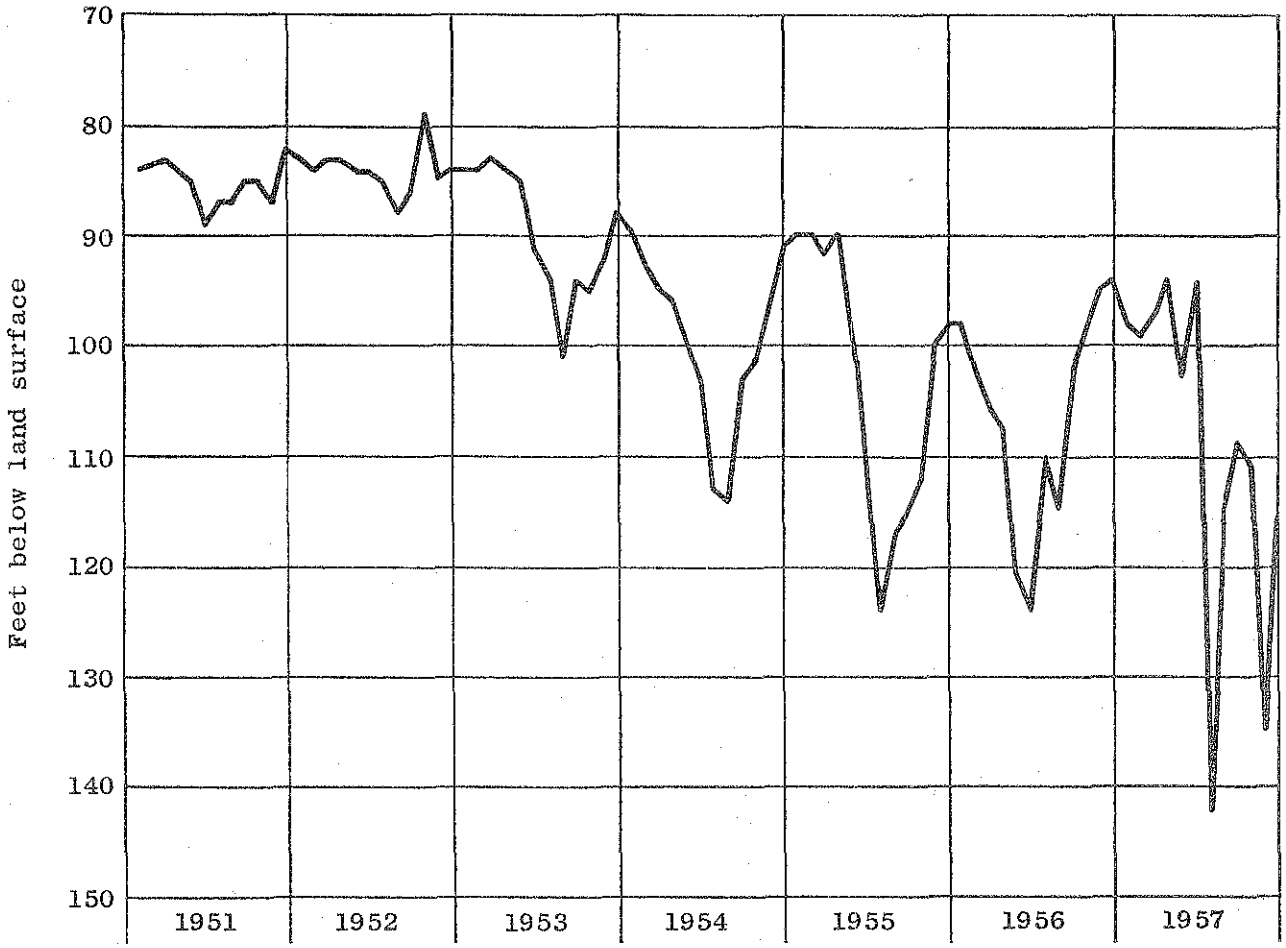


Figure 10.--Hydrograph of well FL-15/17/3-32.

Fond du Lac Co. City of Fond du Lac. NW¼SE¼ sec. 3, T. 15 N., R. 17 E. Drilled public-supply artesian well in sandstone of Cambrian age, diam 16 in, reported depth 790 ft, cased to 90. Lsd, 750 ft above msl. MP, center of airline gage, 2.0 ft above lsd. Measured monthly. All plotted.

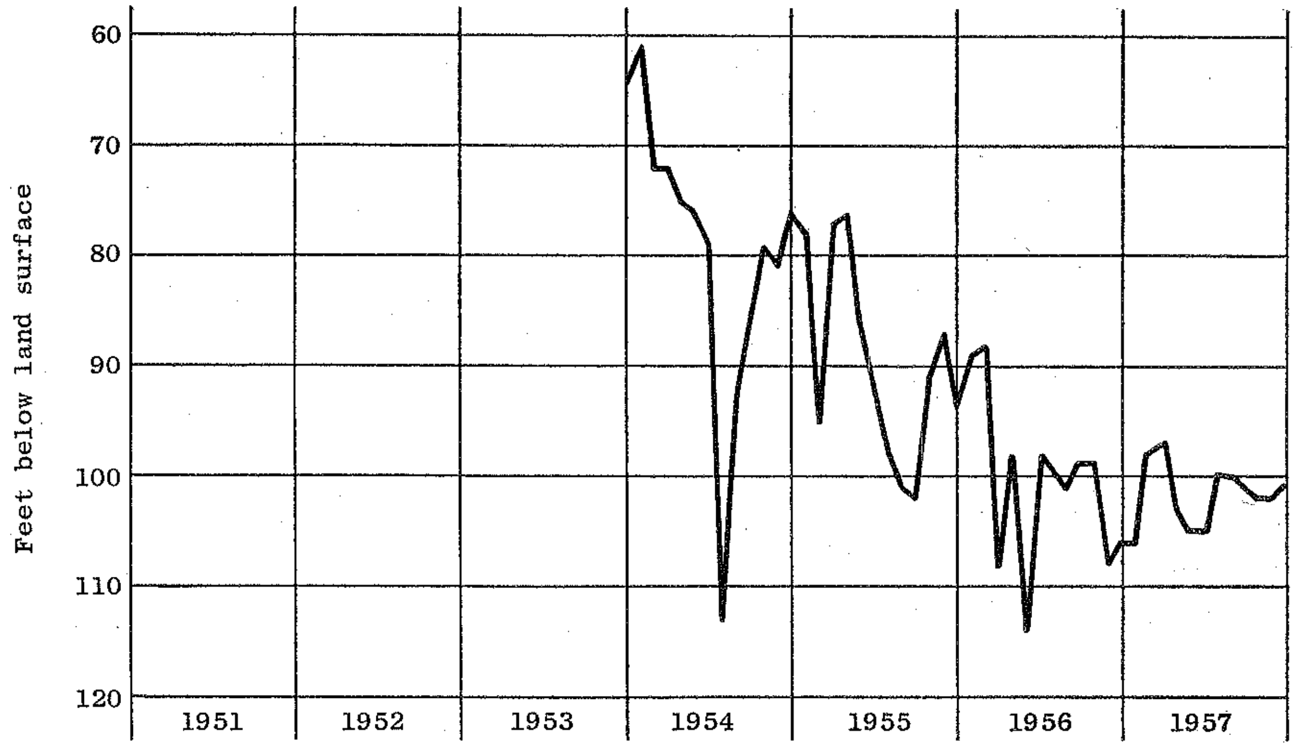


Figure 11.--Hydrograph of well FL-15/17/11-59.

Fond du Lac Co. City of Fond du Lac. NE$\frac{1}{4}$SE$\frac{1}{4}$ sec. 11, T. 15 N., R. 17 E. Drilled public-supply artesian well in sandstone of Cambrian age, diam 24 in, reported depth 835 ft, cased to 155. Lsd, 758 ft above msl. MP, center of airline gage, 1.0 ft above lsd. Measured monthly. All plotted.

in the Green Bay area averaged about 8 mgd (million gallons per day) in 1947, about 10 mgd in 1949, and about 14 mgd in the first half of 1957. From 1949 to 1957, more than half of the total pumpage was by the city of Green Bay and averaged 7.7 mgd. In August 1957, the city of Green Bay began using Lake Michigan as a source of water supply and placed its wells on a standby basis, resulting in a decrease in ground-water withdrawals in the area of about 13 mgd.

When the first deep well in the sandstone aquifer was drilled at DePere in 1886, the static water level was 92 feet above the land surface (Weidman and Schultz, 1915, p. 77). The static water level at Green Bay was reported to be 97 feet above the land surface. By about 1905 water levels had dropped to 28 feet above land surface at DePere and 21 feet at Green Bay. As withdrawals of ground water continued to increase for municipal and industrial use, the levels in wells continued to decline. In well Bn-9, near the center of the cone of depression, nonpumping ground-water levels had declined to about 300 feet below land surface by 1949 and about 350 feet below land surface by 1957 (fig. 19). The piezometric surface of water in the sandstone aquifer in the Green Bay area in August 1957, immediately prior to discontinuing pumping from the city of Green Bay wells, and in March 1958 is shown in figure 7.

Hydrographs of observation wells in the sandstone aquifer in Brown County (figs. 15-23) show a persistent long-range trend of declining water levels to August 1957, as a result of the gradually increasing pumping of ground water by municipalities and industries. From 1947 to 1957, the declines in water levels ranged from about 10 feet in well Bn-51 (fig. 20), located northwest of Green Bay towards the recharge area, to about 75 feet in well Bn-11 (fig. 15) at DePere.

The withdrawals of ground-water in the Green Bay area resulted in declines in water levels at relatively great distances from Green Bay; for example, the level in well Dr-11 (fig. 38) in Door County, 20 miles northeast of Green Bay, declined about 20 feet from 1950 to 1957.

The cessation of pumping from the Green Bay municipal wells in August 1957 resulted in a rapid recovery in water levels. The greatest rise in water level occurred in well Bn-9, near the center of pumping, which had recovered about 170 feet by December 1957 (fig. 19) and about 250 feet by March 1959. Smaller rises in water levels in other observation wells were recorded, depending on the distances from the municipal wells.

Below-normal temperatures in August-October, 1952 resulted in lower rates of withdrawal in 1952 than in 1951. The lower rates of withdrawal are reflected by higher water levels in wells Bn-9 (fig. 19), Bn-11 (fig. 15), Bn-16 (fig. 16), Bn-51 (fig. 20), and Bn-76 (fig. 18). Below normal temperatures in the summer of 1956 also resulted in lower rates of withdrawals and slightly higher water levels in some observation wells than in the summer of 1955.

Madison area

The most important aquifer in the Madison area is the sandstone of Cambrian age. The pumpage in the area is mostly by the Madison municipal wells and averaged 15 mgd in 1957.

In 1882 water levels in deep wells in the Madison area were reported to be 5 to 15 feet above the level of Lake Mendota (Weidman and Schultz, 1915, p. 291). A gradual increase in pumpage from wells caused a gradual decline of water levels.

In 1958 a cone of depression (fig. 12), about one mile in diameter, was located about half a mile northeast of the State Capitol and was caused by the intensive pumping of 4 closely-spaced municipal wells in that area. The depth to water in the center of the cone was approximately 65 feet below the level of Lake Mendota in January 1958.

The rising trend of the water level in well Dn-5 (fig. 31), at the State Capitol, reflects a gradual decrease in pumpage from wells in this area. Large water-level declines have not occurred in wells in most of the Madison area because the wells are spaced approximately one mile apart so that mutual interference is small.

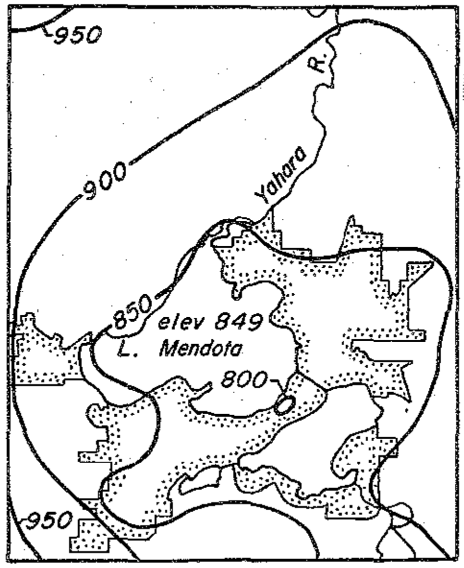
The map of the piezometric surface of water in sandstone of Cambrian age in the Madison area (fig. 12) indicates there is natural discharge of ground water into the Yahara river and Lake Mendota, and shows the effect of pumping from widely-spaced wells.

Milwaukee-Waukesha area

The Milwaukee-Waukesha area includes Milwaukee County and the eastern half of Waukesha County. Ground-water conditions in the area are described in U. S. Geological Survey Water-Supply Paper 1229, "Ground-water conditions in the Milwaukee-Waukesha area, Wisconsin," by F. C. Foley and others.

Sandstones of Cambrian and Ordovician ages and the Niagara dolomite of Silurian age, supply large quantities of water for municipal and industrial use. The sandstone units were considered by Foley and others (1953, p. 28) to form a single aquifer, which they called the sandstone aquifer. The Maquoketa shale of Ordovician age acts as a more or less effective seal between the Niagara dolomite above and the sandstone aquifer below.

Ground-water withdrawals from the sandstone aquifer and the Niagara dolomite were estimated at about 38 mgd in 1949 (Foley and others, 1953, p. 64-67). About 25 mgd was pumped from deep wells in the sandstone aquifer and about 13 mgd was pumped from the Niagara dolomite. By 1957, the pumpage from these aquifers had increased to about 46 mgd. The pumpage from the sandstone aquifer was estimated at about 27 mgd and from the Niagara dolomite at about 19 mgd.



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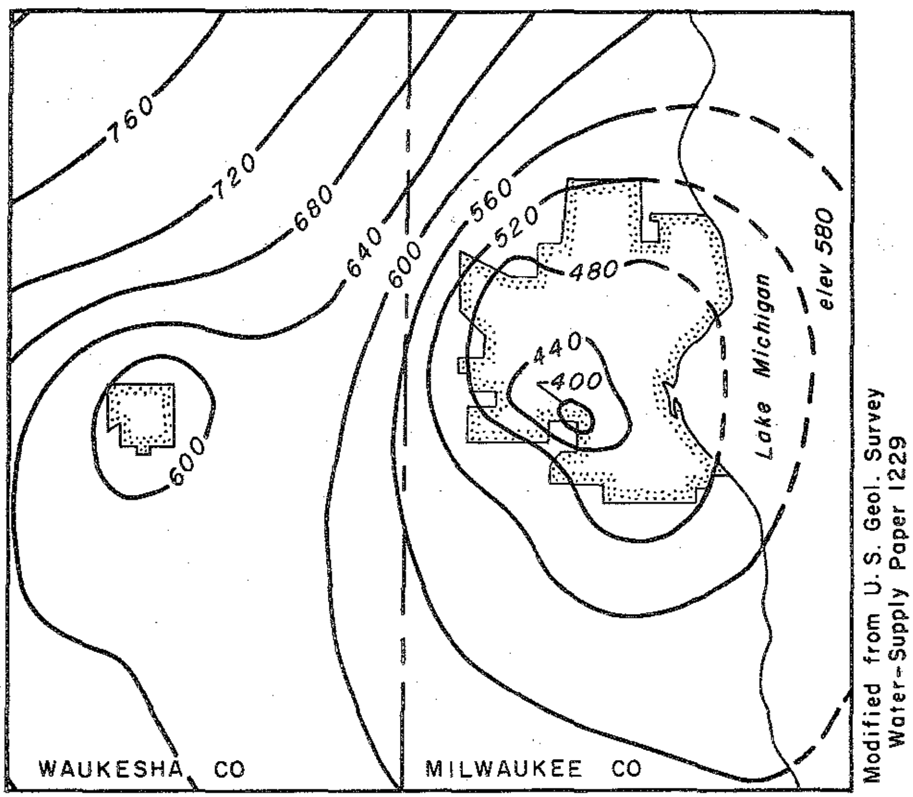
Datum is mean sea level

Contour interval 50 feet

MADISON AREA



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Datum is mean sea level

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MILWAUKEE-WAUKESHA AREA

Figure 12.--Maps showing contours on the piezometric surface in the Madison area in January 1958 and in the Milwaukee-Waukesha area in September 1950.

The gradual increase in the amount of ground water pumped in the area has been accompanied by declining water levels in both the sandstone aquifer and the Niagara dolomite. The piezometric surface of water in the sandstone aquifer in 1950 is shown in figure 12. The deepest part of the cone of depression was in the southwestern part of Milwaukee. In 1950 the center of the cone of depression in the piezometric surface of water in the Niagara dolomite underlaid most of downtown Milwaukee.

The water levels in wells in the sandstone aquifer are lower than water levels in the overlying Niagara dolomite. Water may move downward through wells open in both aquifers from the dolomite into the sandstone. Prior to 1950, well Ml-45 was cased through the Niagara dolomite and open in the sandstone aquifer. In 1946-49 the hydrograph shows water-level fluctuations of the sandstone aquifer (fig. 96). In late 1949 the casing apparently ruptured opposite the Niagara dolomite allowing the well to begin filling with rock debris, which sealed off the water from the sandstone aquifer. In 1950-51 the water level rose almost 100 feet. Since 1951, water-level fluctuations have been representative of water levels in wells in the dolomite aquifer.

Seasonal fluctuations in water levels in wells in the sandstone aquifer caused by seasonal changes in the rates of pumping, are shown in the hydrographs of wells Ml-36 (fig. 93), Ml-94 (fig. 90), and Ml-95 (fig. 87), and well Wk-14 (fig. 152). Water levels are generally lowest in late summer when air temperatures are highest and the pumpage of water is greatest.

The hydrographs of wells Ml-22 (fig. 94), Ml-36 (fig. 93), and Ml-95 (fig. 87), and wells Wk-14 (fig. 152) and Wk-20 (fig. 153) show a long-range downward trend in water levels, caused by gradually increasing pumpage from the sandstone aquifer. The rate of decline ranges from about 8 feet per year in well Ml-22 to about 1 foot per year in well Wk-20. Prior to 1952, water levels in well Wk-20 fluctuated chiefly in response to changes in recharge and natural discharge.

The hydrographs of wells Ml-118 (fig. 98) and Ml-148 (fig. 91) and well Wk-50 (fig. 154A)show long-range fluctuations in water level in response to changes in recharge and natural discharge to the Niagara dolomite and seasonal fluctuations caused by changes in the rates of pumping. The water levels are generally highest in the spring and decline through the summer and fall to the lowest level in the winter. The hydrographs of wells Ml-120 (fig. 95), Ml-121 (fig. 86), Ml-130 (fig. 88), and Ml-146 (fig. 99) show a long-range downward trend in water levels owing to gradually increasing pumpage from the Niagara dolomite and seasonal fluctuations in water levels caused by changes in the rates of pumping. Fron 1946 to 1957, the declines in water levels ranged from about 8 feet in well Ml-130 to about 15 feet in well Ml-120.

Deposits of Pleistocene age mantle older rocks in most of the Milwaukee-Waukesha area. Ground-water withdrawals from the Pleistocene deposits were estimated at about 0.5 mgd in 1949 (Foley and others, 1953, p. 67) and are believed to have been less than 1 mgd in 1957. The hydrograph of well Ml-135 (fig. 92) shows long-range fluctuations in water level in response to changes in recharge and natural discharge and seasonal fluctuations caused by changes in pumping rates.

Central sand plain

In 1957 ground water was pumped for irrigation from about 200 wells and pits in 17 counties. More than 75 percent of the wells were in the central sand plain, and about one-third were in Portage County. As used in this report, the central sand plain includes most of Adams County, the eastern parts of Juneau and Wood Counties, the western parts of Portage and Waushara Counties, central Marathon County, and southwestern Langlade County.

Water levels in wells in the sand and gravel deposits respond rapidly to changes in storage caused by changes in recharge and natural discharge. An example is the hydrograph for 1952 of well Ws-7 (fig. 5) in Waushara County. The water level declined gradually from January to late March and then rose rapidly in late March and April in response to thawing of frost in the ground and recharge by snow melt and precipitation. The net decline in water levels from January 1952 through December 1952 was a result of below-average precipitation.

The long-range fluctuations in water levels in most of the wells reflect changes in storage in response to changes in recharge and natural discharge. An example of such fluctuations in water level are shown in the hydrograph of well Mr-28 (fig. 76) in Marathon County. The water level was the highest of record (17.30) in 1945, after which it declined gradually to the lowest of record (24.84) in the spring of 1951. The water level rose in the latter part of 1951 and 1952, fluctuated only slightly in response to seasonal changes in recharge and natural discharge in 1953-55, and then declined gradually to a near-record low level in 1957.

The long-term downward trends in water levels in observation wells in the central sand plain have been caused by below-average precipitation.

SUMMARY

Water level measurements in Wisconsin were begun in a few wells in 1934. Measurements were made in 1957 in 204 observation wells in 65 counties. Local and regional variations in storage caused by changes in recharge and natural discharge and changes in pumping from wells are reflected in the fluctuations of the water levels.

Water levels are generally highest in the spring, owing to thawing of the frost zone and precipitation, after which they decline through the summer, rise slightly in the fall and decline through the winter. In general, in areas not affected by pumping, water levels gradually rose from 1940 to 1947 and declined from 1947 to 1951. They rose again in 1951 and 1952, after which they declined through 1957.

Large declines in water levels have occurred in the heavily-pumped Milwaukee-Waukesha area, and smaller, but significant, declines have been recorded in a few other areas. In most of the State, however, water levels have not seriously declined. Even in the areas of heavy pumping much additional ground water can be obtained from properly spaced wells.

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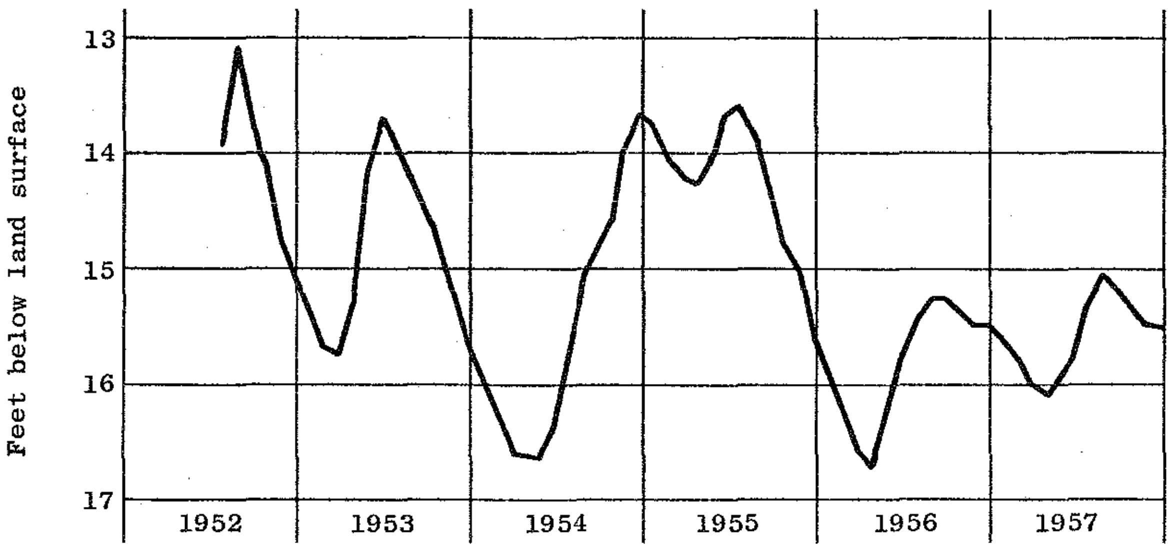

Figure 13.--Hydrograph of well Ad-17/6/5-2.

Adams Co. Wisconsin Conservation Dept. NW¼SW¼ sec. 5, T. 17 N., R. 6 E. Jetted observation water-table well in sand of Pleistocene age, diam 2 in, depth 21 ft, well point 19-21. MP, top of casing, 1.70 ft above lsd. Measured weekly. Lowest monthly plotted.

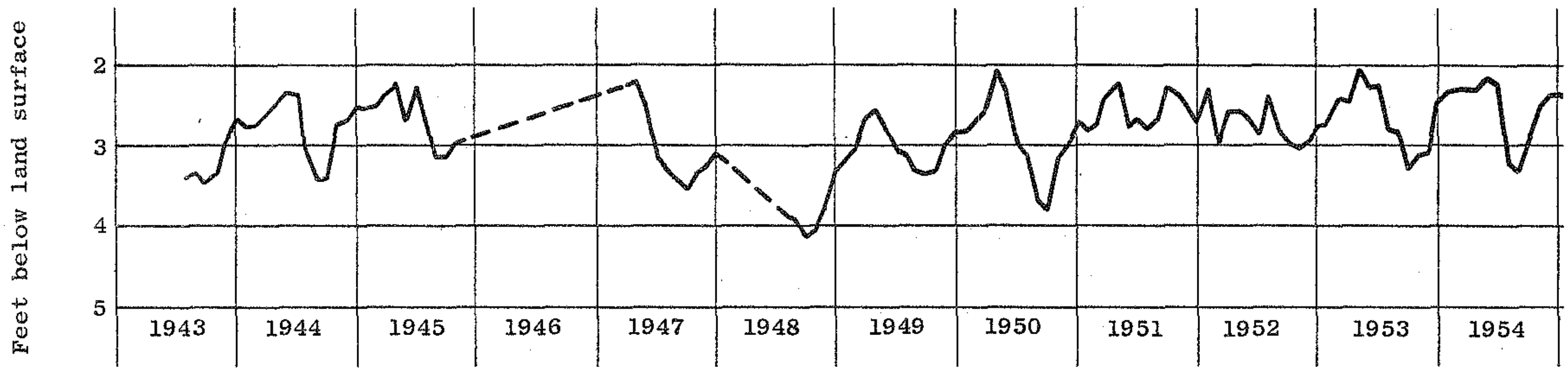

Figure 14.--Hydrograph of well As-46/4W/6-1.

Ashland Co. Lake Superior District Power Co. NE$\frac{1}{4}$NE$\frac{1}{4}$ sec. 6, T. 46 N., R. 4 W. Drilled unused artesian well in Lake Superior sandstone, diam 4 in, reported depth 90 ft, cased to 15. Lsd, 690 ft above msl. MP, top of casing, 0.75 ft above lsd. Measured weekly. Lowest monthly plotted.

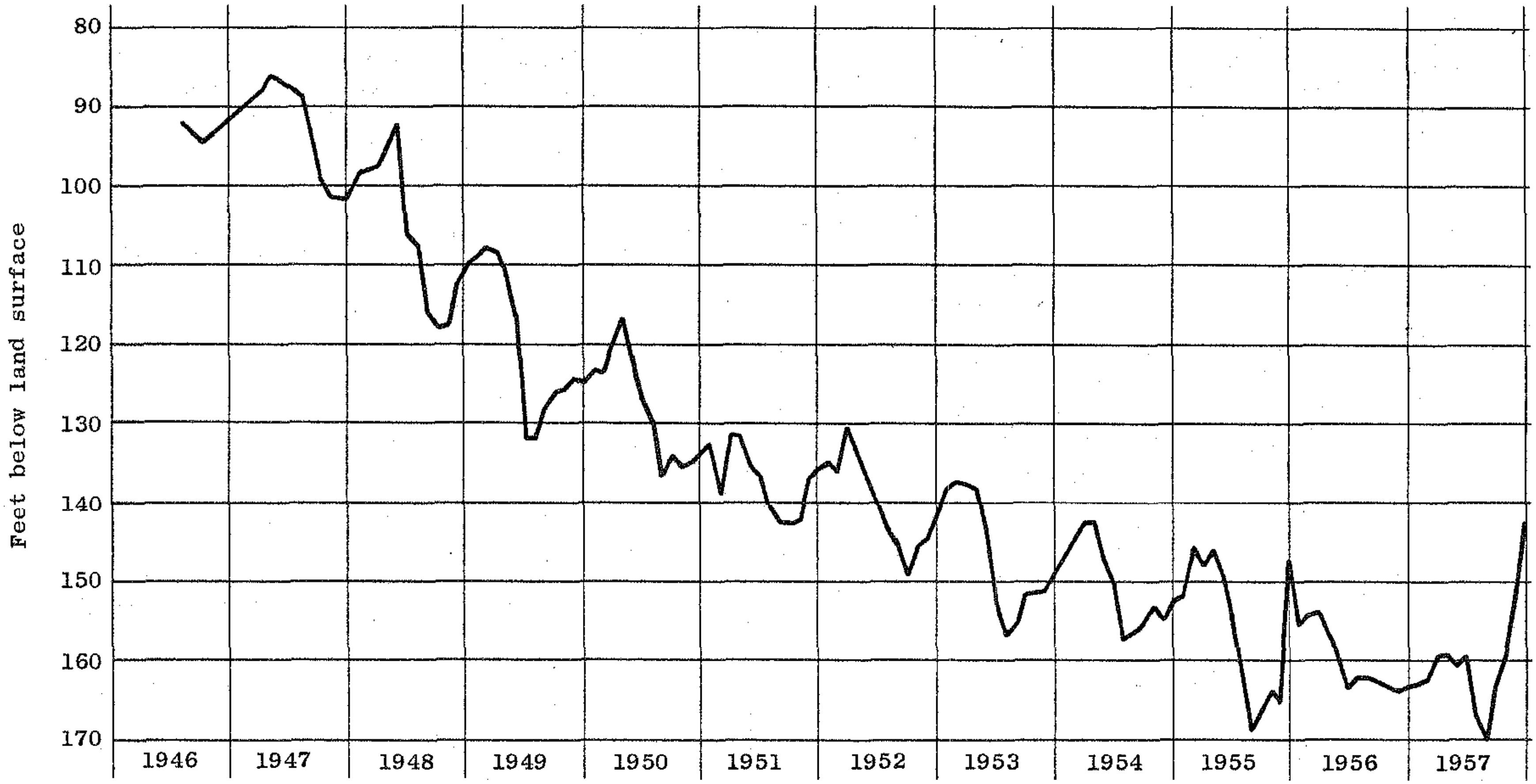

Figure 15.--Hydrograph of well Bn-23/20/22-11.

Brown Co. City of De Pere. Broadway and George Sts. NE$\frac{1}{4}$SW$\frac{1}{4}$ sec. 22, T. 23 N., R. 20 E. Drilled unused artesian well in sandstone of Cambrian age, diam 12 in, reported depth 835 ft. Lsd, 612 ft above msl. MP, 6.0 ft below lsd. Recording gage. Lowest monthly plotted. Measured bimonthly before August 1948.

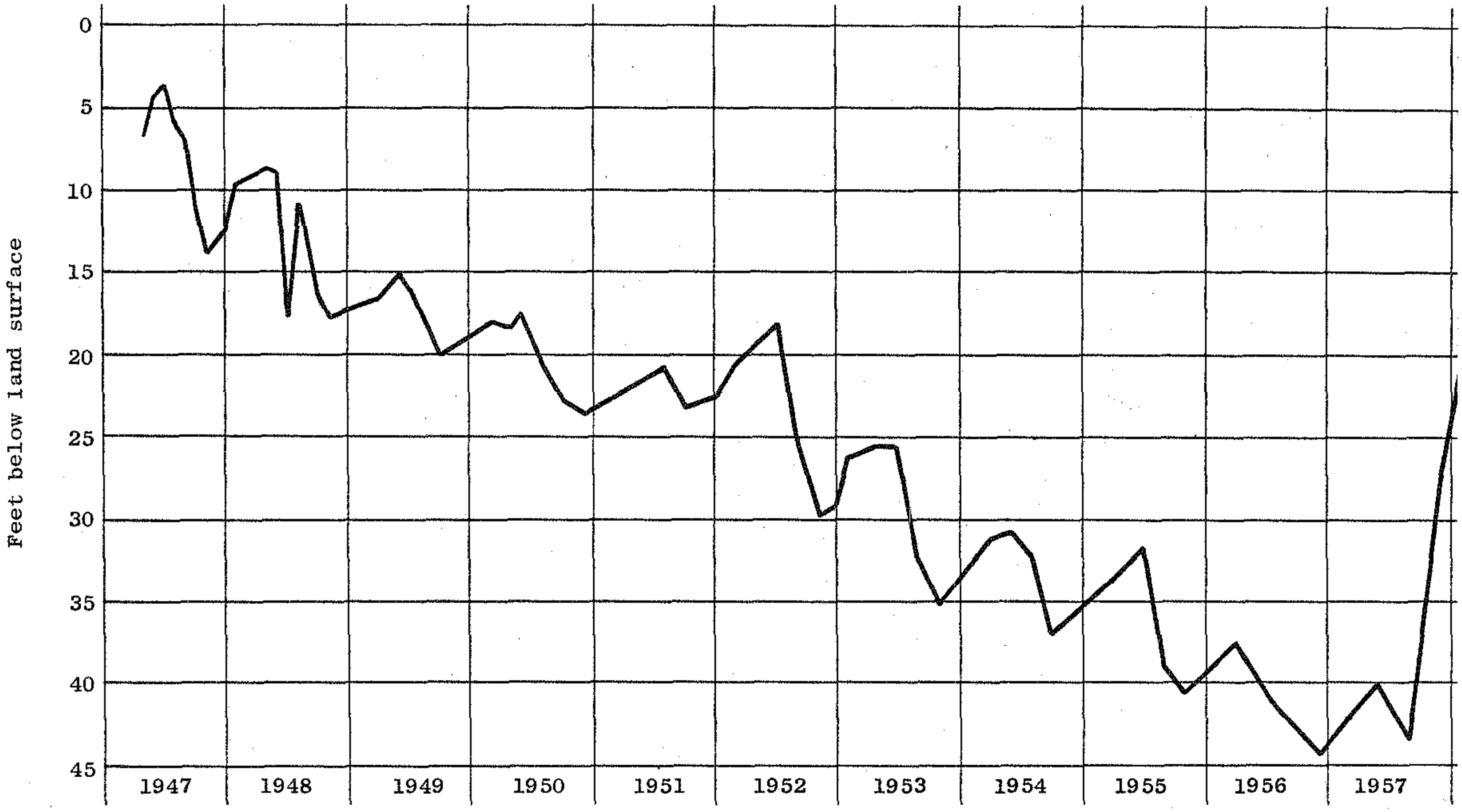

Figure 16.--Hydrograph of well Bn-24/19/35-16.

Brown Co. Frank Vandehei. SE¼NE¼ sec. 35, T. 24 N., R. 19 E. Drilled domestic and stock artesian well in sandstone of Cambrian age, diam 8 in, reported depth 800 ft. Lsd, 659 ft above msl. MP, top of 8 in coupling, 1.0 ft above lsd. Measured bi-monthly. All plotted.

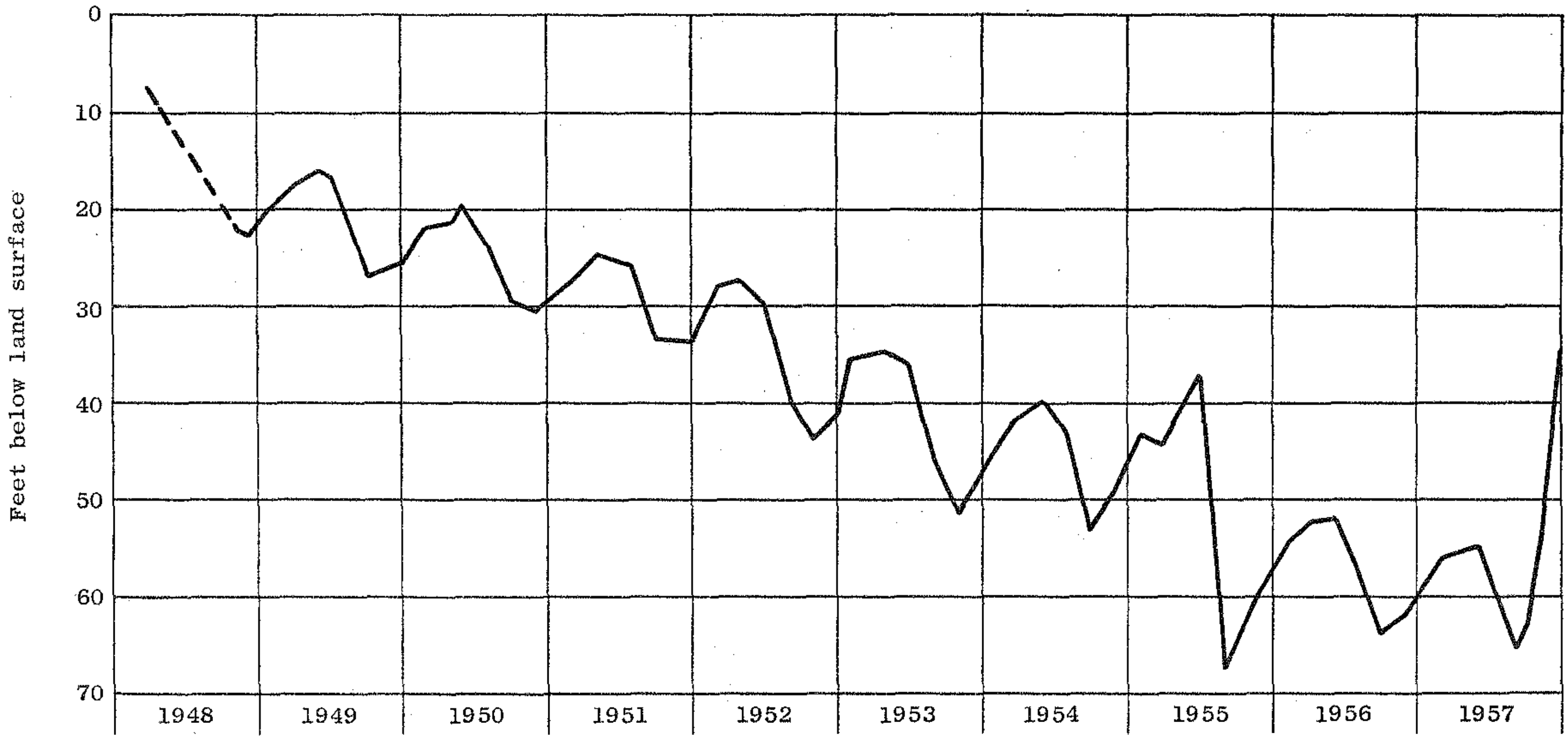

Figure 17.--Hydrograph of well Bn-24/20/2-43.

Brown Co. Harry Nick. SW¼SW¼ sec. 2, T. 24 N., R. 20 E. Drilled unused artesian well in St. Peter sandstone, diam 5 in, depth 297 ft, reported cased to 60. MP, top of 1½-in pipe, 2.00 ft above lsd. Measured bi-monthly. All plotted.

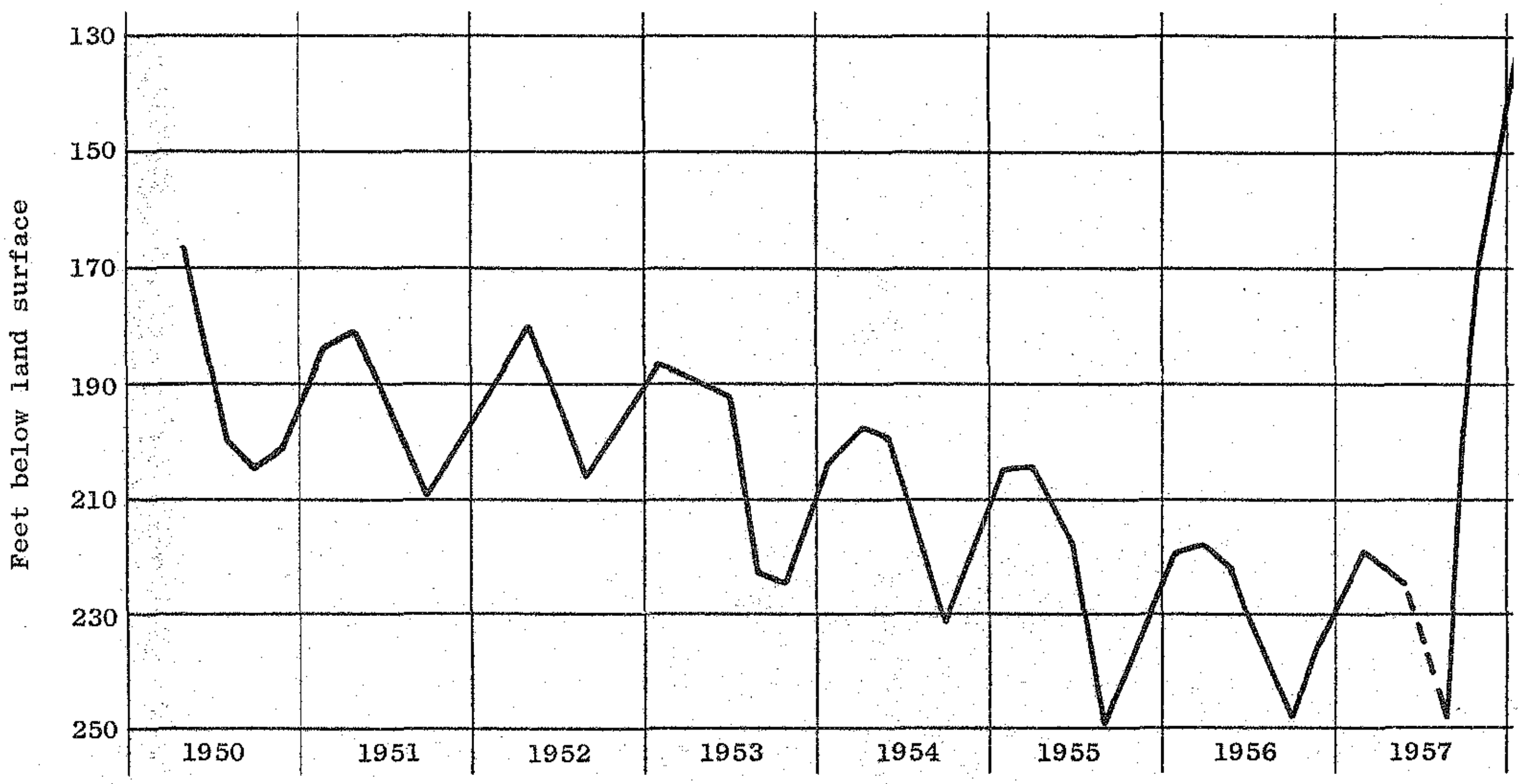

Figure 18.--Hydrograph of well Bn-24/20/24-76.

Brown Co. Wisconsin Public Service Corp. SE$\frac{1}{4}$NE$\frac{1}{4}$ sec. 24, T. 24 N., R. 20 E. Drilled unused artesian well in sandstone of Cambrian age and St. Peter sandstone, diam 5 in, reported depth 500 ft, cased to 150. MP, top of 3-in reduction, 4.00 ft above lsd. Measured bi-monthly. All plotted.

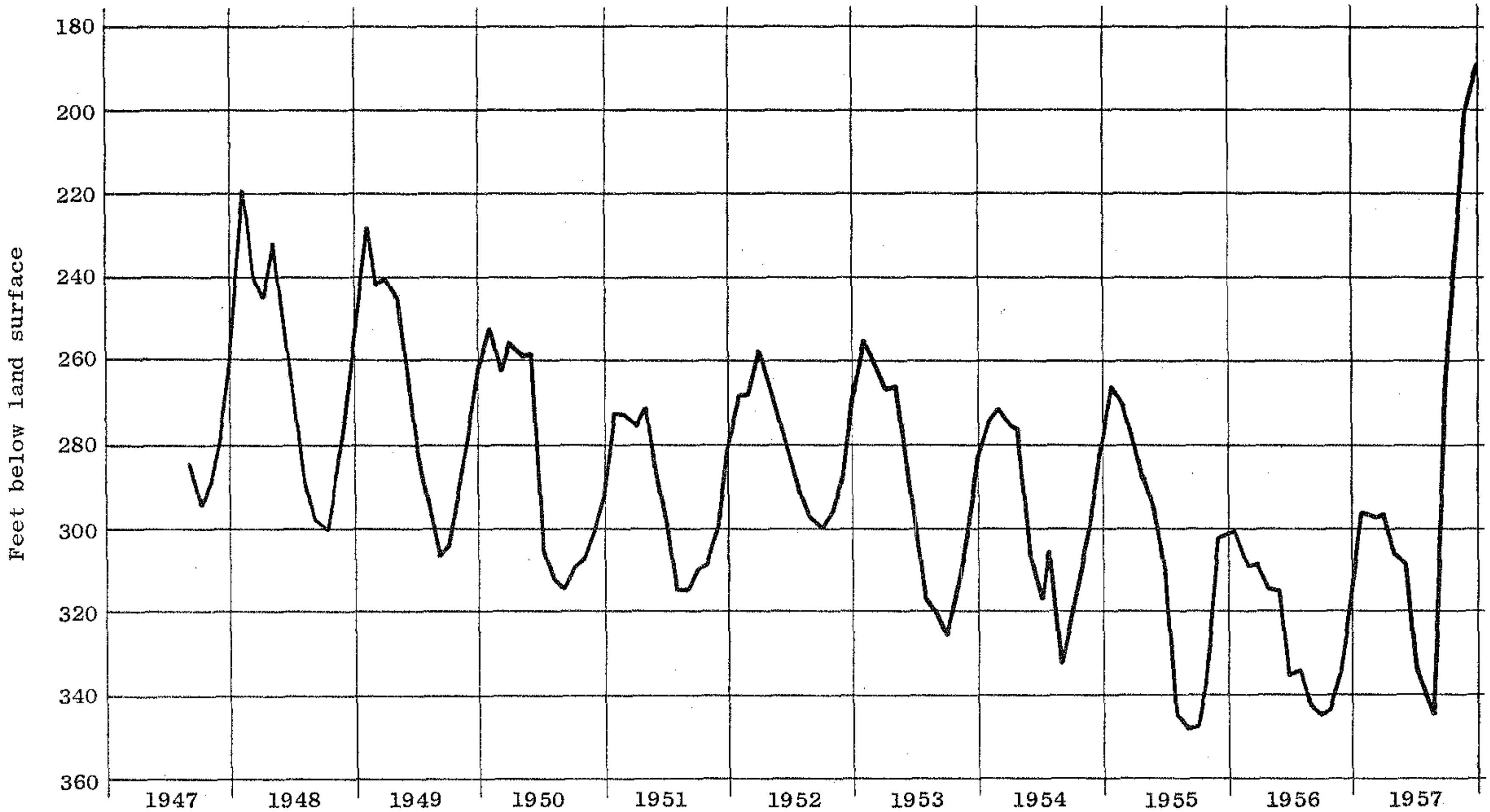

Figure 19.--Hydrograph of well Bn-24/20/25-9.

Brown Co. Larsen Canning Co. 320 North Broadway, Green Bay. SE¼SW¼ sec. 25, T. 24 N., R 20 E. Drilled unused artesian well in sandstone of Cambrian age, diam 8 in, depth 800 ft. Lsd, 590 ft above msl. MP, top of wood recorder base, 5.0 ft below lsd. Recording gage. Lowest monthly plotted.

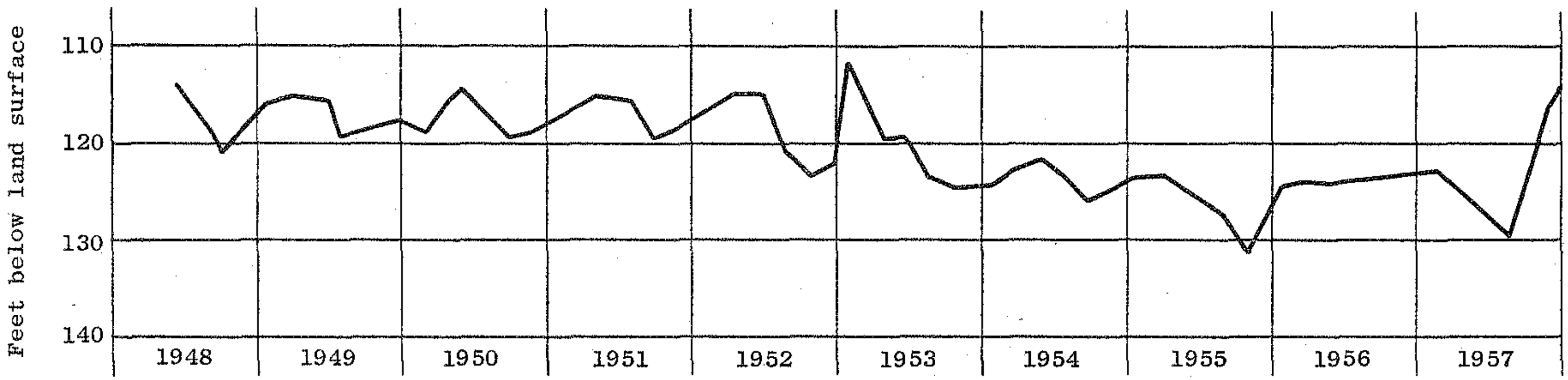

Figure 20.--Hydrograph of well Bn-24/20/29-51.

Brown Co. Larsen Orchards. NW$\frac{1}{4}$NE$\frac{1}{4}$ sec. 29, T. 24 N., R. 20 E. Drilled domestic artesian well in sandstone of Cambrian age, diam 6 in, reported depth 800 ft. Lsd, 698 ft above msl. MP, top of casing, at lsd. Measured bi-monthly. All plotted.

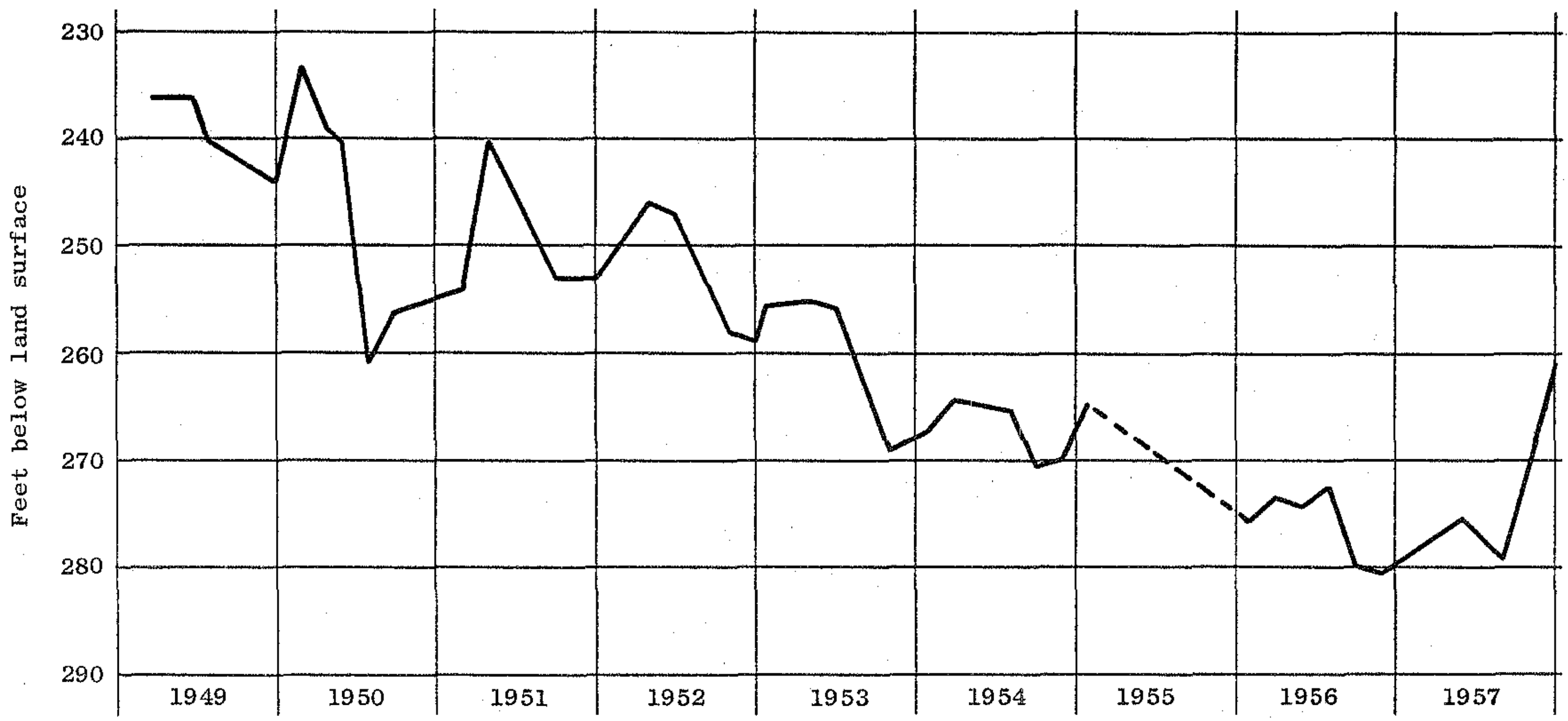

Figure 21.--Hydrograph of well Bn-24/21/13-72.

Brown Co. Gregoire Denis. NE$\frac{1}{4}$SE$\frac{1}{4}$ sec. 13, T. 24 N., R. 21 E. Drilled domestic artesian well in sandstone of Cambrian age, diam 8 to 6 in, reported depth 1,006 ft, cased to 400. Lsd, 735 ft above msl. MP, pump base, 3.0 ft below lsd. Measured bi-monthly. All plotted.

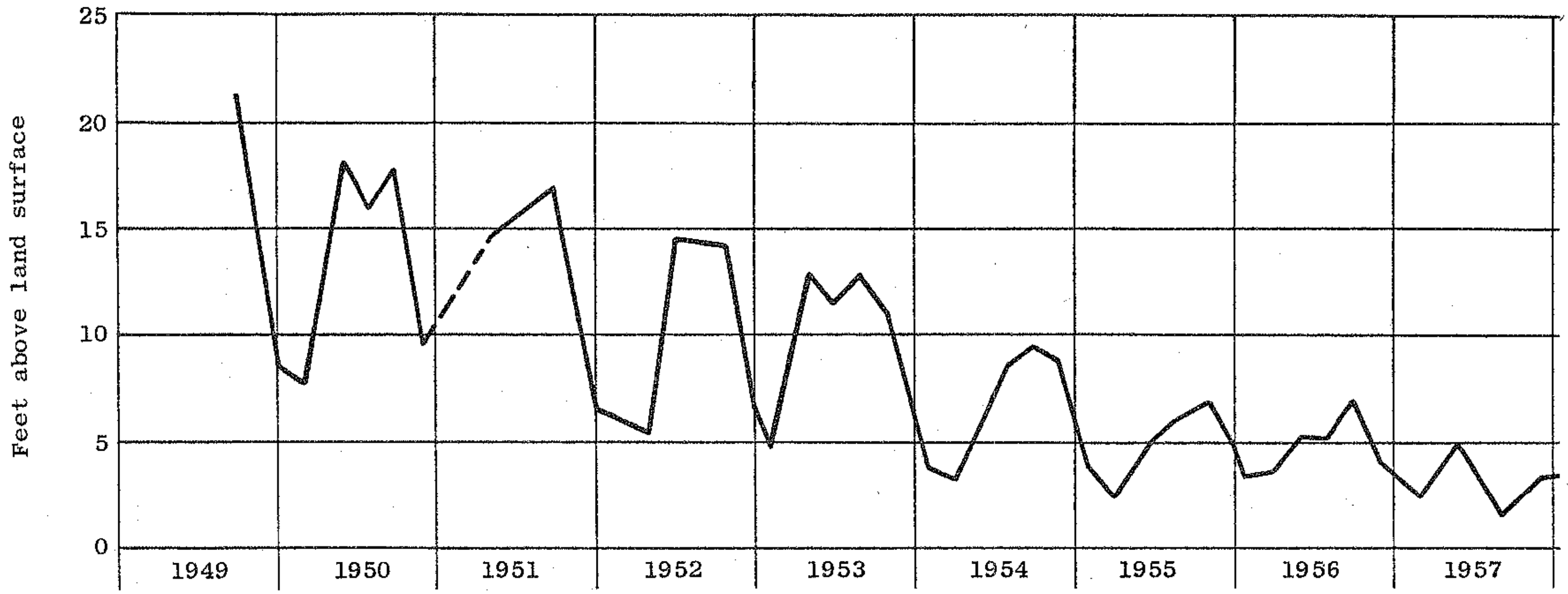

Figure 22.--Hydrograph of well Bn-25/21/7-78.

Brown Co. Carl Jenkins. SW¼SW¼ sec. 7, T. 25 N., R. 21 E. Drilled domestic artesian well in St. Peter sandstone, diam 6 in, reported depth 198 ft. Lsd, 587 ft above msl. MP, top of casing, 0.5 ft above lsd. Measured bi-monthly. All plotted.

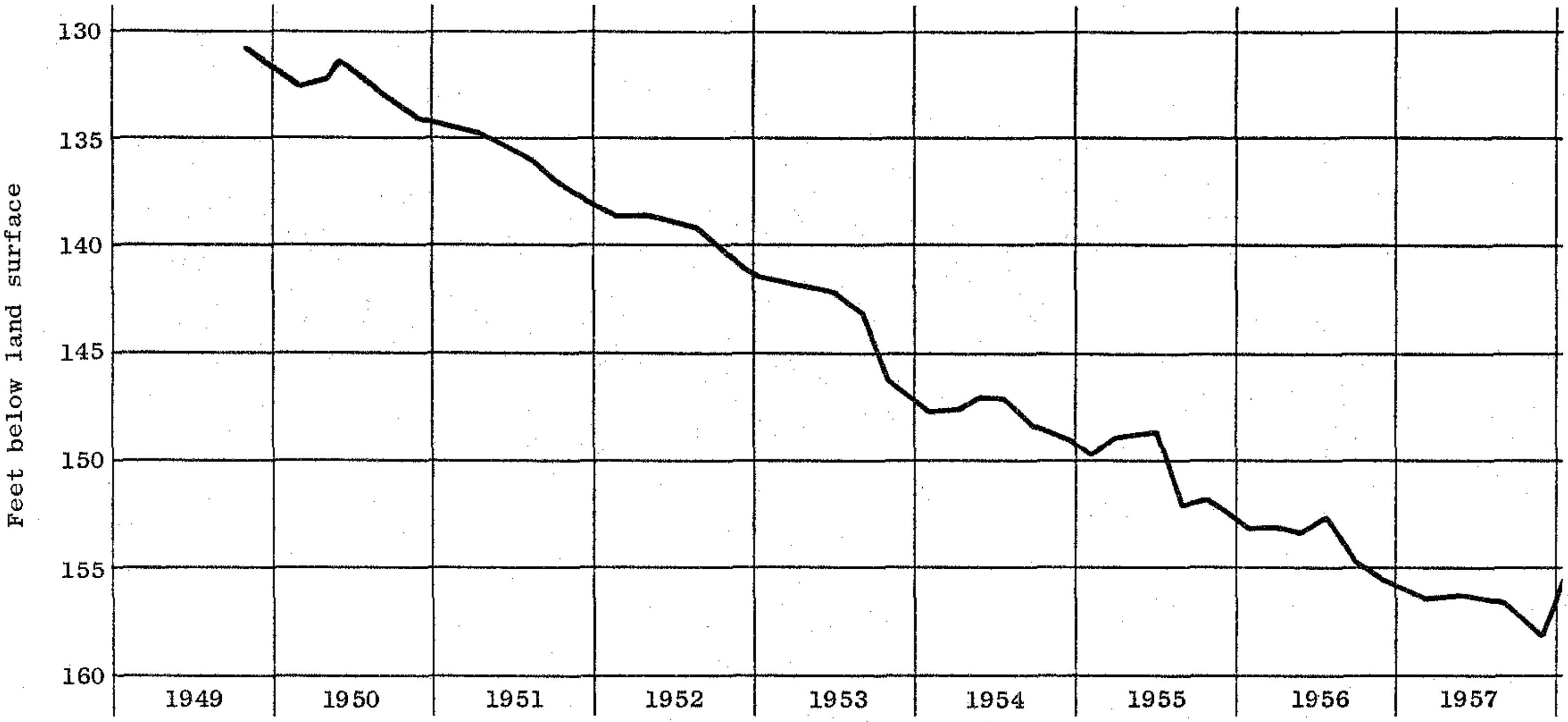

Figure 23.--Hydrograph of well Bn-25/22/14-80.

Brown Co. J. C. Pennings. NW¼SW¼ sec. 14, T. 25 N., R. 22 E. Drilled domestic artesian well in sandstone of Cambrian age, diam 8 in, reported depth 1,043 ft. Lsd, 690 ft above msl. MP, hole in top of casing, 6.4 ft below lsd. Measured bi-monthly. All plotted.

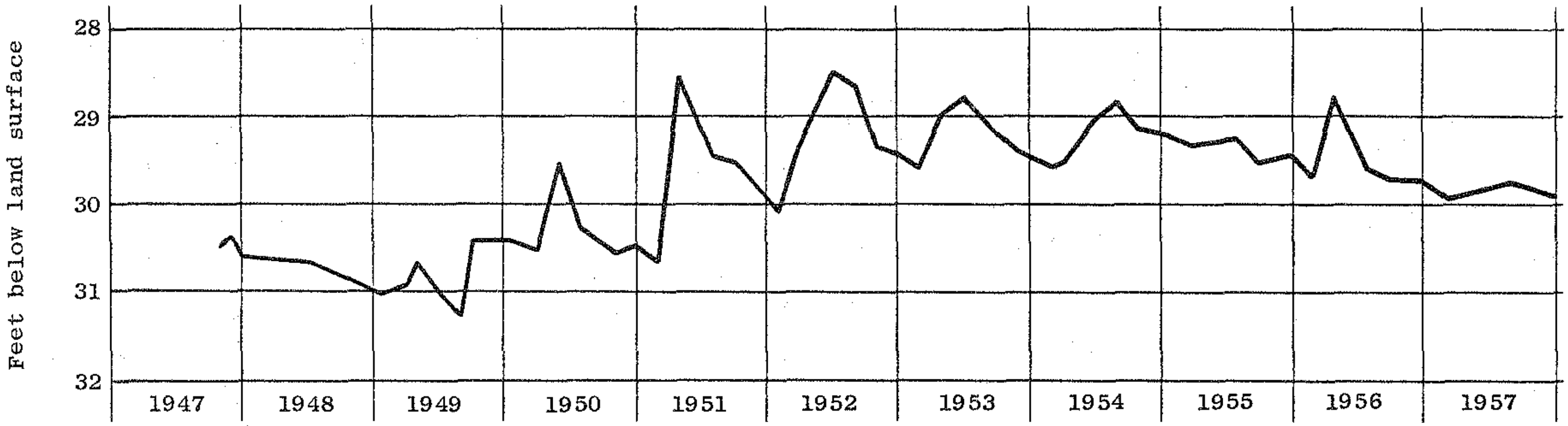

Figure 24.--Hydrograph of well Bf-21/12W/29-1.

Buffalo Co. Donald C. DeMarce. SW¼SE¼ sec. 29, T. 21 N., R. 12 W. Drilled domestic water-table well in sandstone of Cambrian age, diam 4 in, depth 78 ft. MP, top of casing, 1.5 ft above lsd. Measured bi-monthly. All plotted.

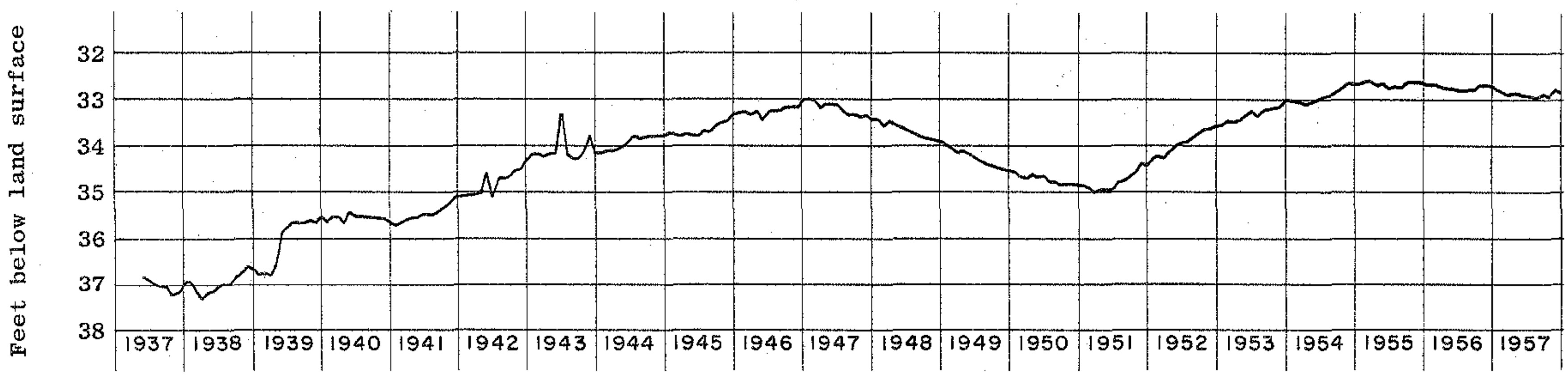

Figure 25.--Hydrograph of well Bt-39/16W/17-2.

Burnett Co. Wisconsin Conservation Dept. NE¼NE¼ sec. 17, T. 39 N., R. 16 W. Drilled observation water-table well in sand of Pleistocene age, diam 8 in, depth 46 ft, perforated 44½-46. Lsd, 981 ft above msl. MP, pointer on float gage, 4.87 ft above lsd. Measured weekly. Lowest monthly plotted.

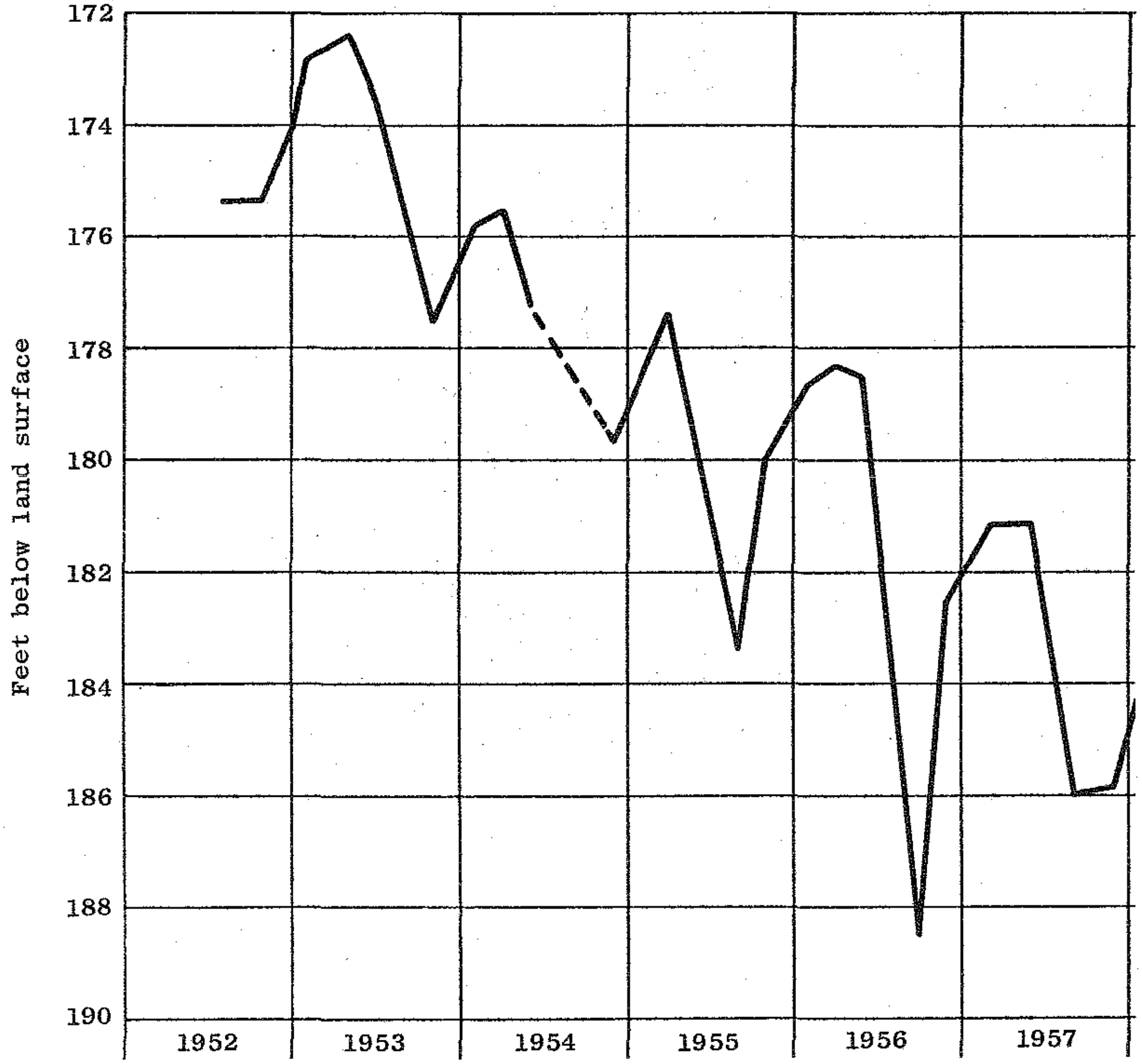

Figure 26.--Hydrograph of well Ca-20/19/2-6.

Calumet Co. Fall River Canning Co. NW¼SW¼ sec. 2, T. 20 N., R. 19 E. Drilled industrial artesian well in sandstone of Upper Cambrian age and St. Peter sandstone, diam 12 to 8 in, reported depth 1,050 ft, cased to 270, 6 in liner 570-652. Lsd, about 820 ft above msl. MP, pump base, at lsd. Measured bi-monthly. All plotted.

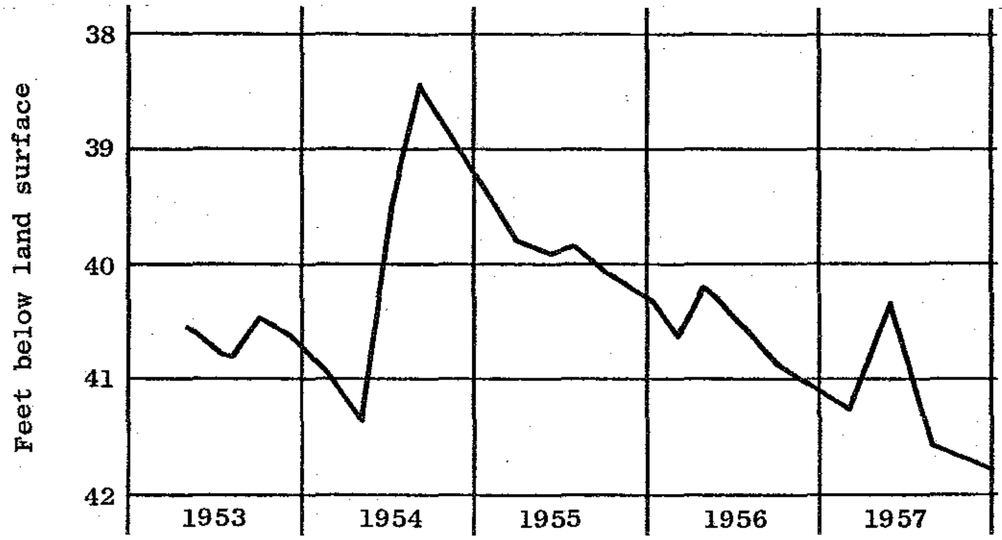

Figure 27A.--Hydrograph of well Ch-29/8W/18-11.

Chippewa Co. University Colony. NE¼SE¼ sec. 18, T. 29 N., R. 8 W. Drilled public-supply water-table well in drift of Pleistocene age, diam 6 in, depth 90 ft, cased to 78, screen 78-90. MP, top of breather pipe, 5.0 ft below lsd. Measured bi-monthly. All plotted.

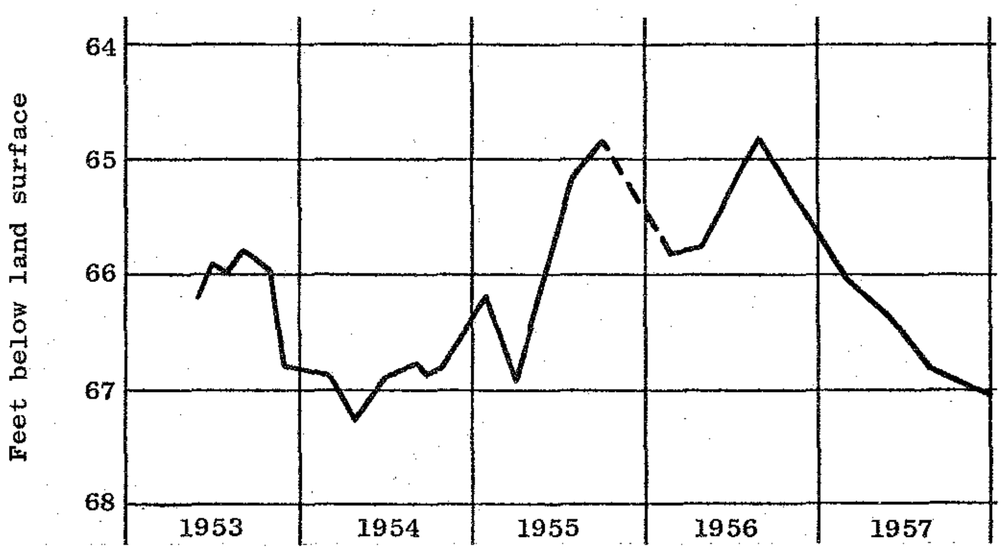

Figure 27B.--Hydrograph of well Ck-26/3W/4-1.

Clark Co. Wisconsin Conservation Dept. North Mound Tower. SE¼SE¼ sec. 4, T. 26 N., R. 3 W. Drilled domestic artesian well in sandstone of Cambrian age, diam 6 in, reported depth 150 ft, cased to 53. MP, hole in pump base, at lsd. Measured weekly. Lowest monthly plotted.

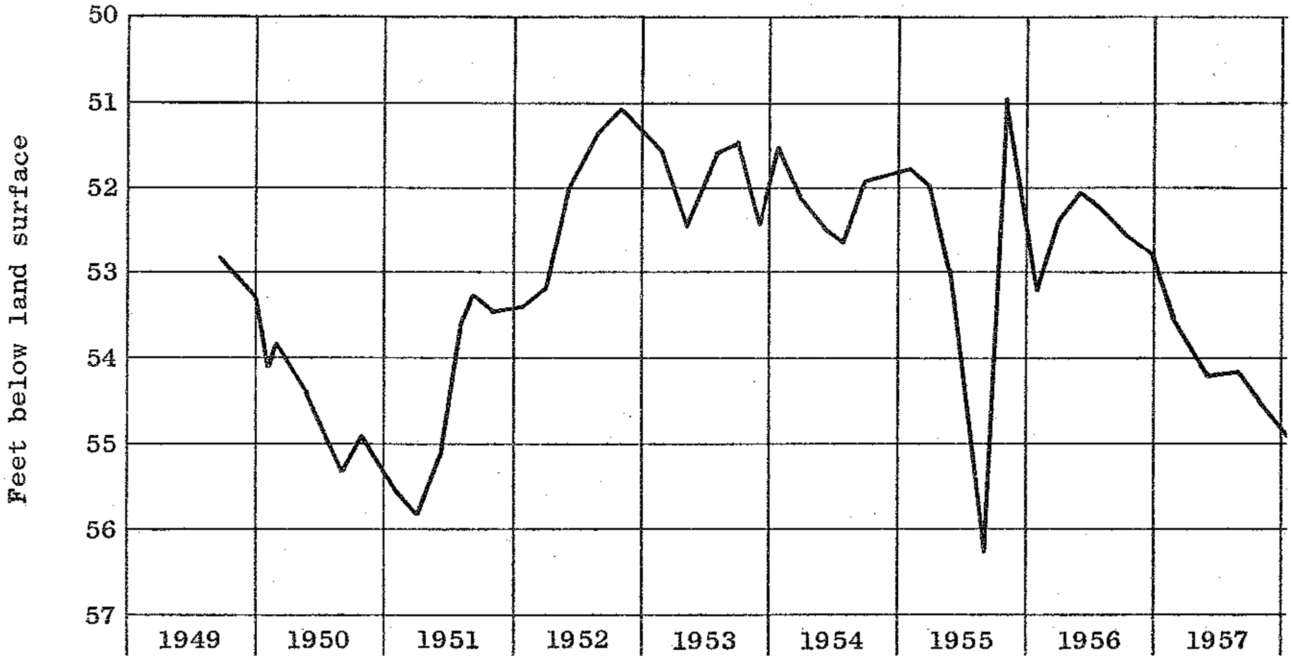

Figure 28A.--Hydrograph of well Co-11/9/36-22.

Columbia Co. Wisconsin Fur and Game Farm. NE¼NE¼ sec. 36, T. 11 N., R. 9 E. Drilled unused water-table well in sandstone of Cambrian age, diam 6 in, depth 75 ft. MP, rim of casing, at lsd. Measured bi-monthly. All plotted.

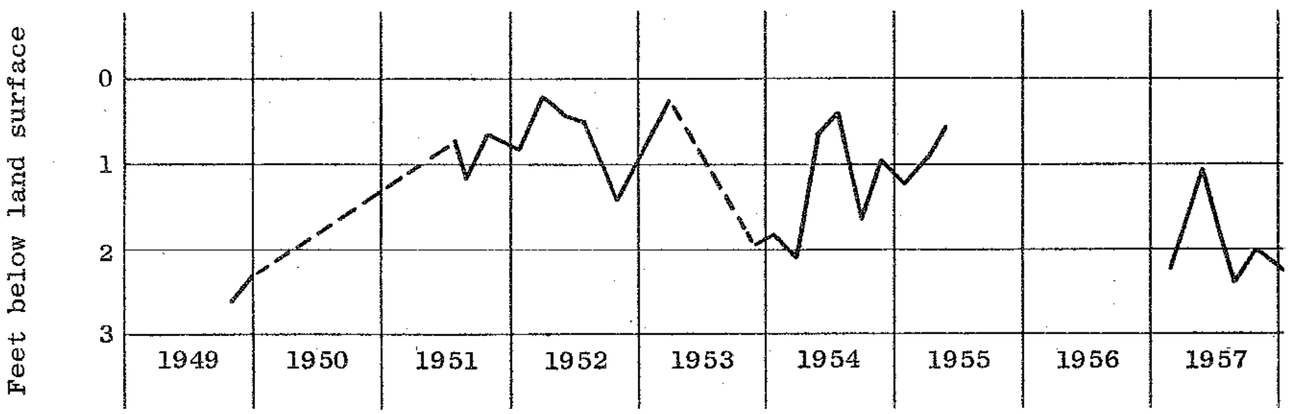

Figure 28B.--Hydrograph of well Co-12/9/5-28.

Columbia Co. Flanders. SE¼NW¼ sec. 5, T. 12 N., R. 9 E. Drilled unused water-table well in sandstone of Cambrian age, diam 6 in, depth 71 ft. MP, top of casing, 2.00 ft above lsd. Measured bi-monthly. All plotted.

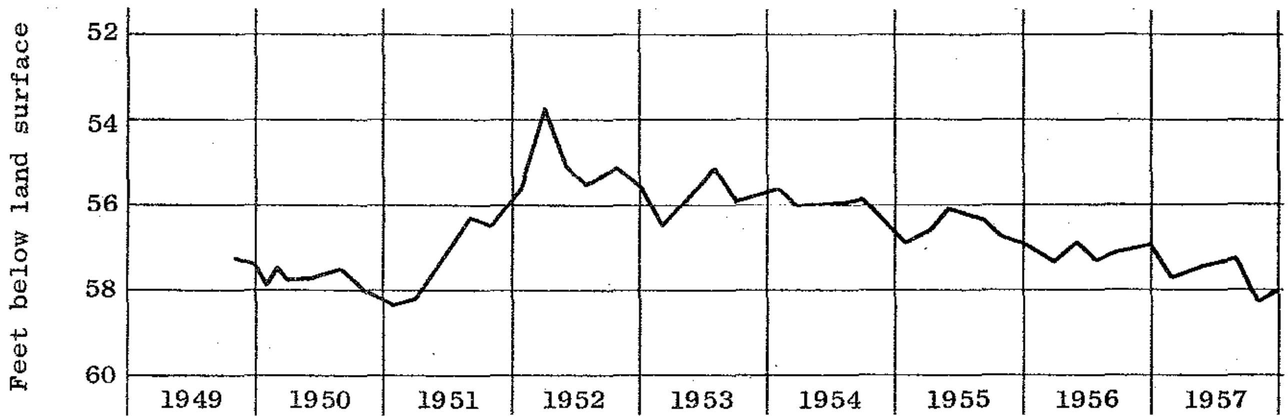

Figure 29A.--Hydrograph of well Co-13/11/29-13.

Columbia Co. F. Stollfus. SE¼SW¼ sec. 29, T. 13 N., R. 11 E. Drilled unused water-table well in sandstone of Cambrian age, diam 6 in, depth 72 ft. MP, hole in pump base, at lsd. Measured bi-monthly. All plotted.

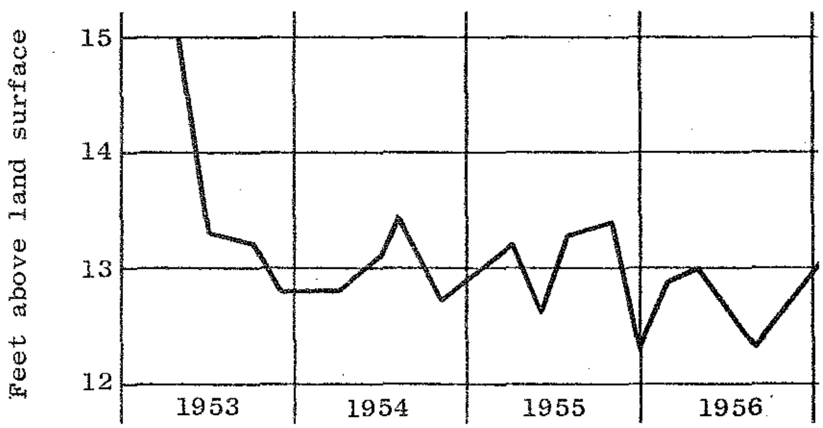

Figure 29B.--Hydrograph of well Cr-7/7/36-2.

Crawford Co. Prairie du Chien General Hospital. NE¼NE¼ sec. 36, T. 7 N., R. 7 W. Drilled public-supply artesian well in sandstone of Cambrian age, diam 8 in, reported depth 990 ft. Lsd, 653 ft above msl. MP, top of casing, 2.0 ft above lsd. Measured bi-monthly. All plotted.

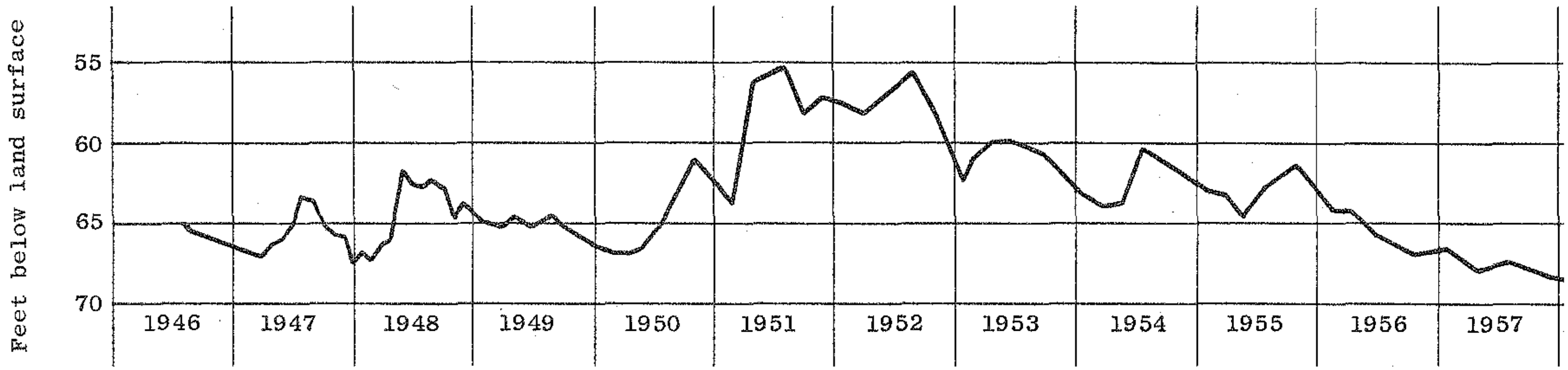

Figure 30.--Hydrograph of well Dn-5/8/32-3.

Dane Co. Gerald Hendrickson. SE¼SE¼ sec. 32, T. 5 N., R. 8 E. Drilled unused water-table well in St. Peter sandstone, diam 6 in, reported depth 100 ft. Lsd, 930 ft above msl. MP, hole in pump base, 0.5 ft above lsd. Measured bi-monthly. All plotted.

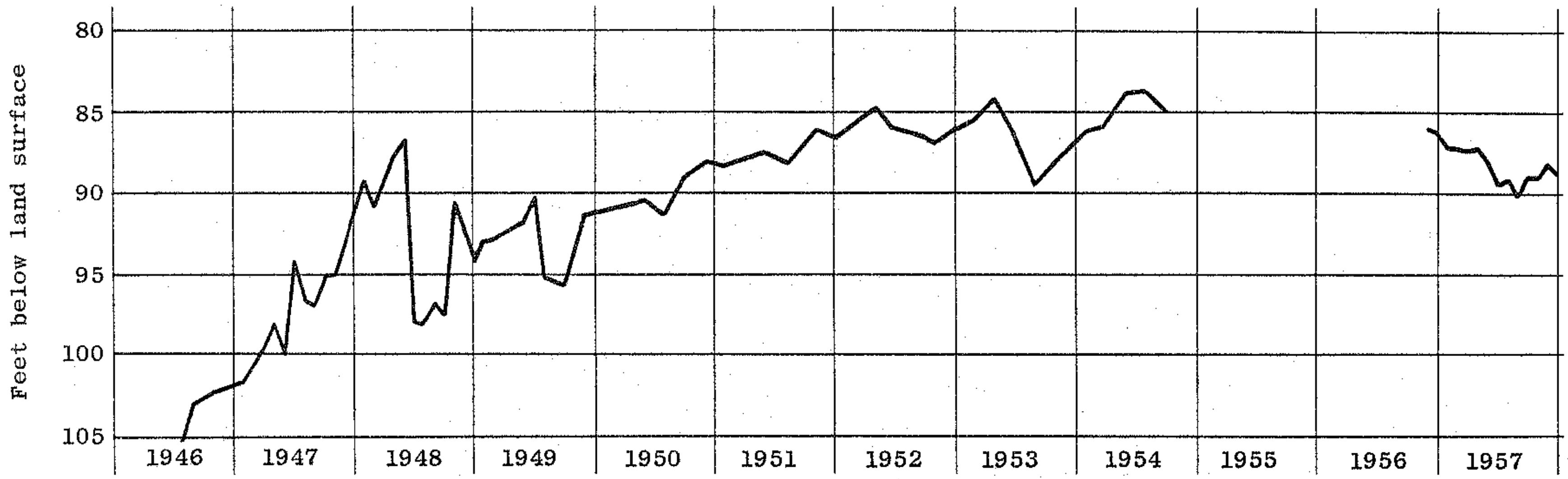

Figure 31.--Hydrograph of well Dn-7/9/23-5.

Dane Co. State of Wisconsin. South wing of State Capitol Bldg. NE¼NE¼ sec. 23, T. 7 N., R. 9 E. Drilled unused artesian well in sandstone of Cambrian age, diam 8 in, depth 316 ft, cased to 265. Lsd, 930 ft above msl. MP, top of 8 in pipe tee, 3.50 ft below lsd. Recording gage. Lowest monthly plotted. Measured bi-monthly before December 1956.

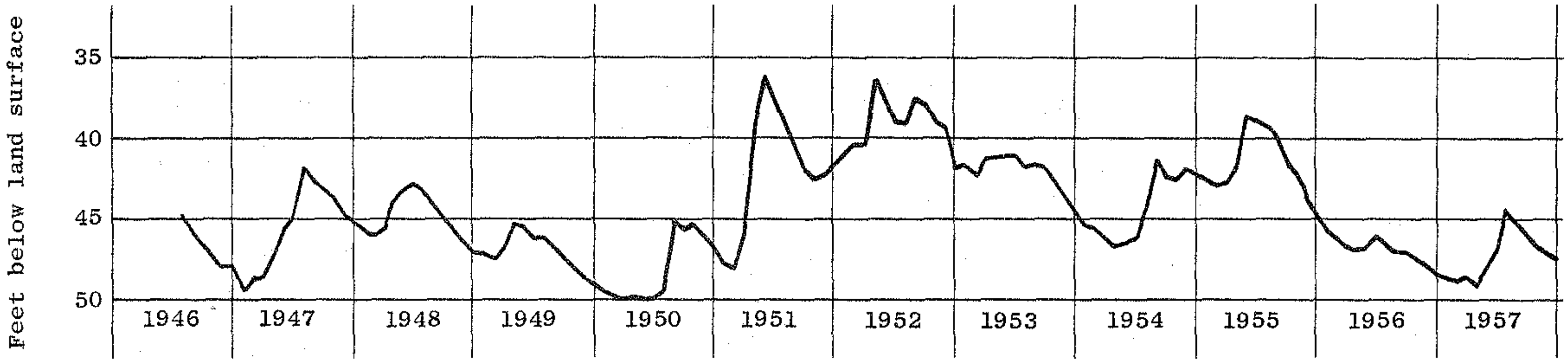

Figure 32.--Hydrograph of well Dn-9/11/34-4.

Dane Co. Joseph N. Hanley. NW¼NE¼ sec. 34, T. 9 N., R. 11 E. Sun Prairie. Drilled unused water-table well in St. Peter sandstone, diam 6 in, depth 70 ft. Lsd, 965 ft above msl. MP, top of flange on casing, 1.0 ft above lsd. Recording gage. Lowest monthly plotted.

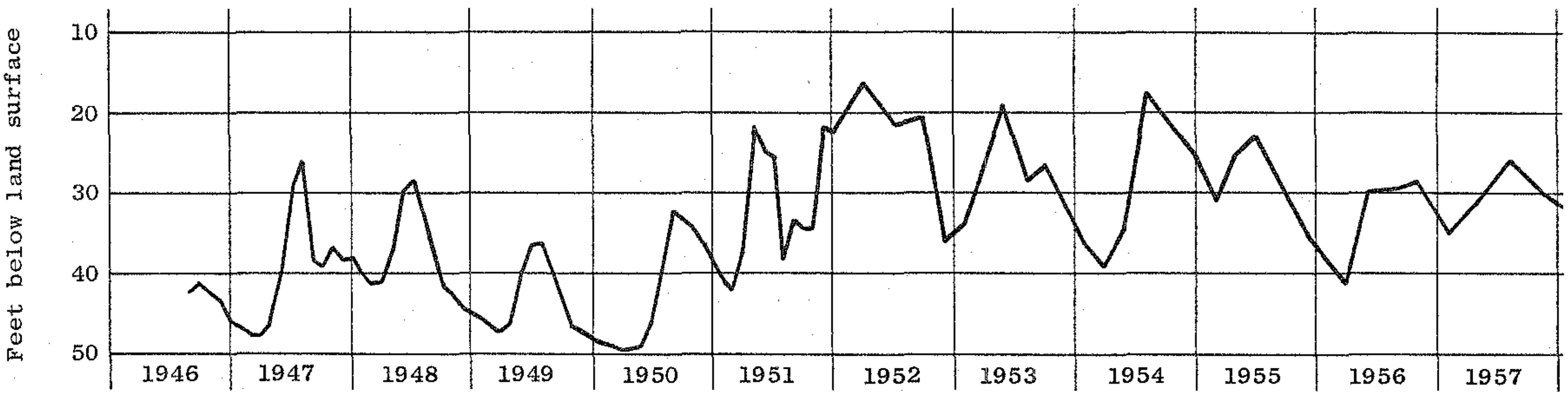

Figure 33.--Hydrograph of well Dg-9/13/1-11.

Dodge Co. F. C. Etscheid. SE¼SW¼ sec. 1, T. 9 N., R. 13 E. Drilled unused artesian well in Precambrian granite, diam 6 in, reported depth 1,880 ft, cased to 1,200. MP, top of casing, at lsd. Measured bi-monthly. All plotted. Recording gage before December 1951.

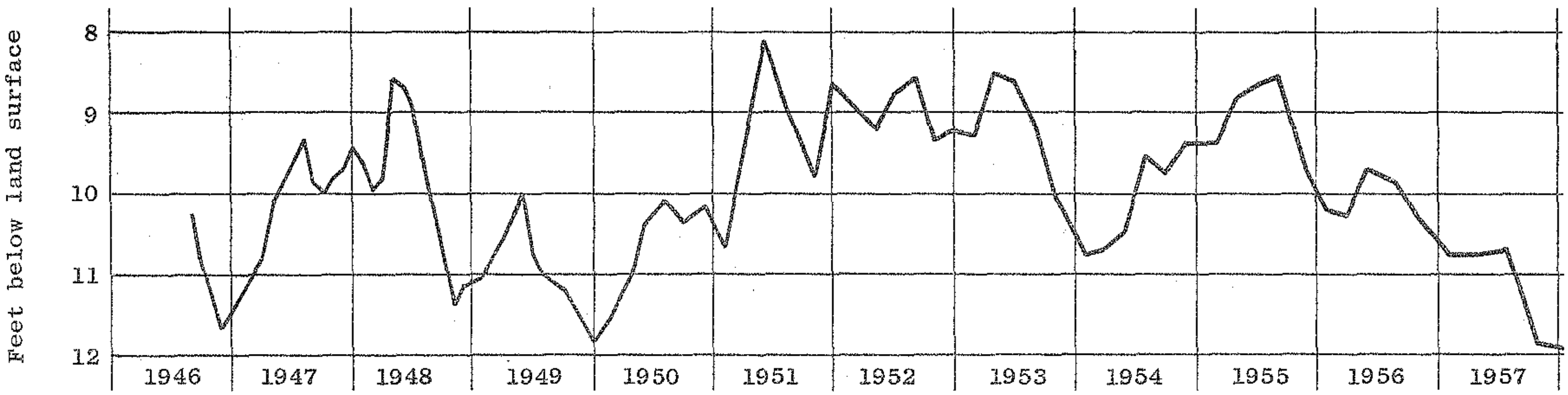

Figure 34.--Hydrograph of well Dg-9/17/30-10.

Dodge Co. Ashippun Fire Department. SE¼SE¼ sec. 30, T. 9 N., R. 17 E. Drilled unused artesian well in Galena dolomite, diam 6 in, reported depth 200 ft. Lsd, 868 ft above msl. MP, bottom of 4 in nipple, 2.6 ft above lsd. Measured bi-monthly. All plotted.

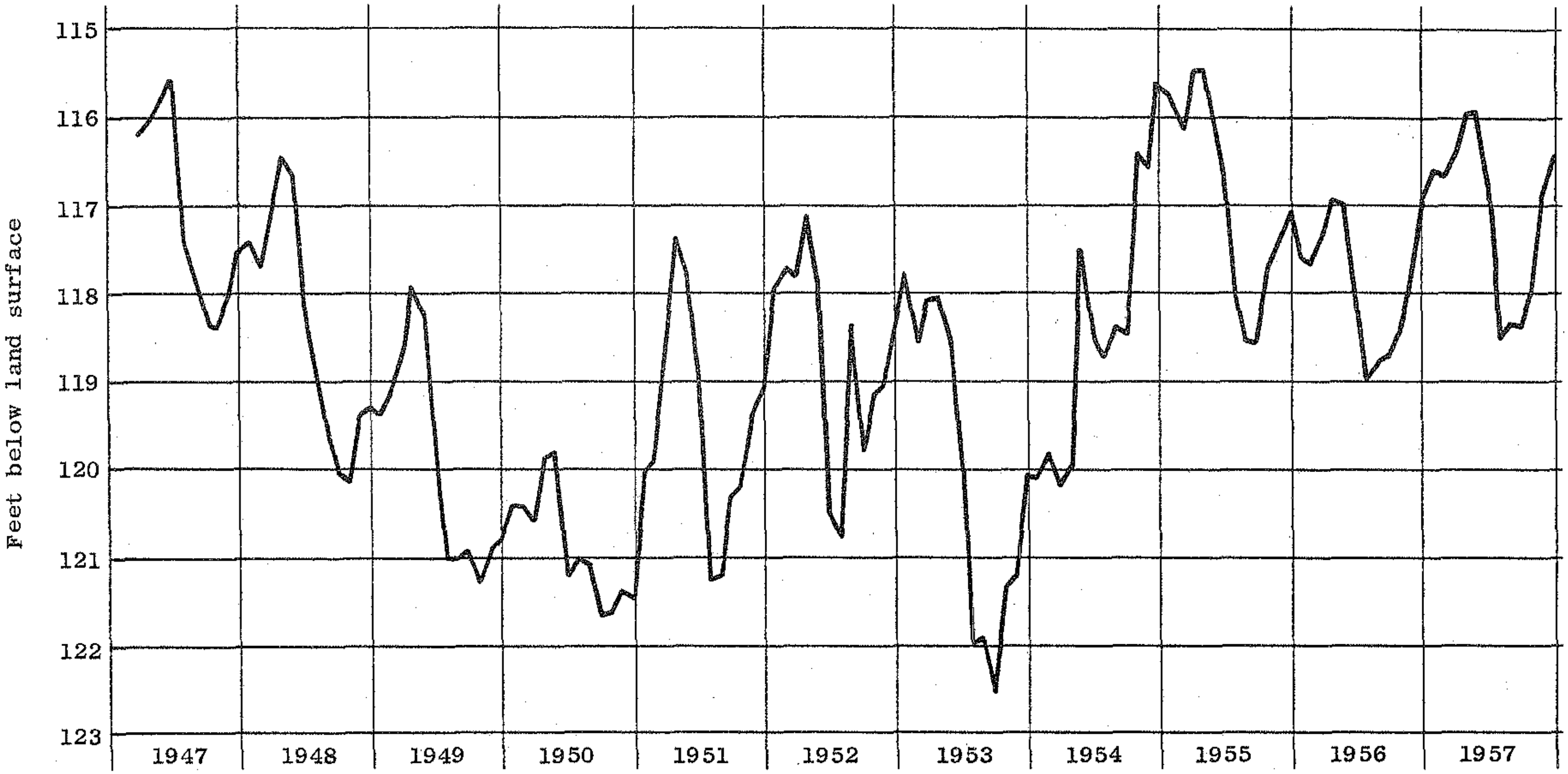

Figure 35.--Hydrograph of well Dg-11/16/5-4.

Dodge Co. City of Horicon. NW$\frac{1}{4}$SW$\frac{1}{4}$ sec. 5, T. 11 N., R. 16 E. Drilled unused artesian well in sandstone of Cambrian age and St. Peter sandstone, diam 8 in, depth 475 ft, cased to 140. Lsd, 980 ft above msl. MP, top of concrete floor, 5.00 ft below lsd. Recording gage. Lowest monthly plotted.

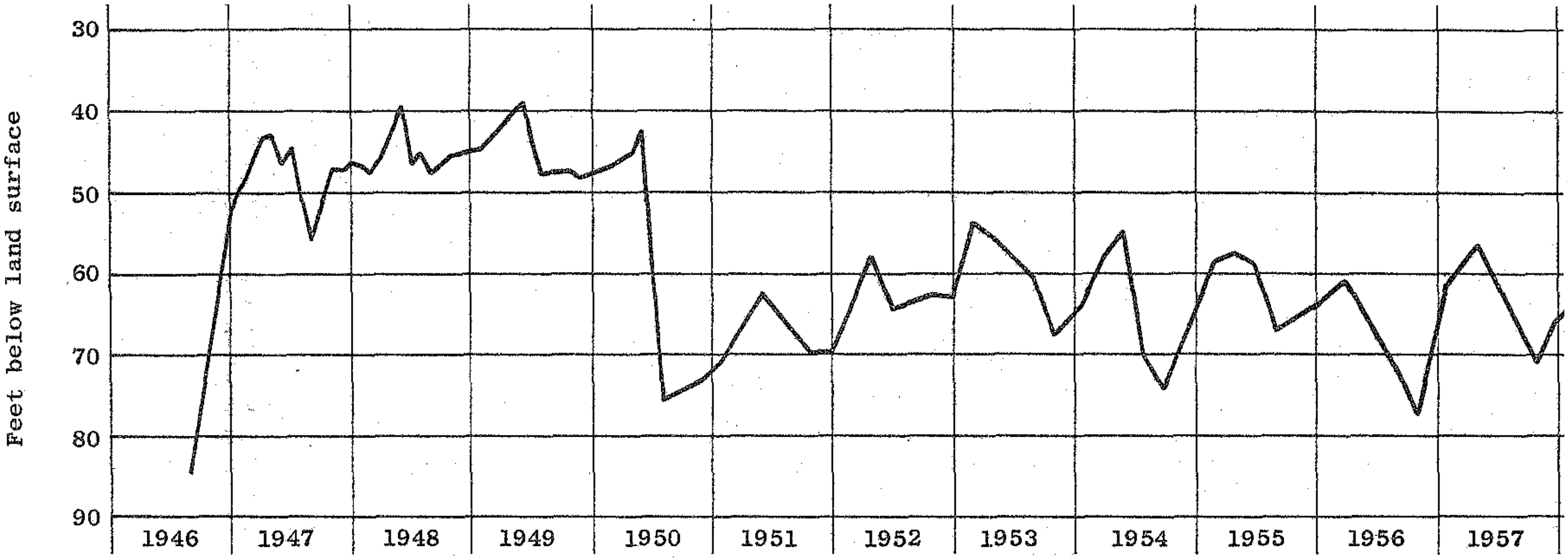

Figure 36.--Hydrograph of well Dg-12/17/10-12.

Dodge Co. Baker Canning Co. $NW\frac{1}{4}SE\frac{1}{4}$ sec. 10, T. 12 N., R. 17 E. Drilled industrial artesian well in sandstone of Cambrian age and St. Peter sandstone, diam 10 to 8 in, reported depth 955 ft, cased to 353. Lsd, 956 ft above msl. MP, bottom of horizontal breather pipe, 2.53 ft above lsd. Measured bi-monthly. All plotted.

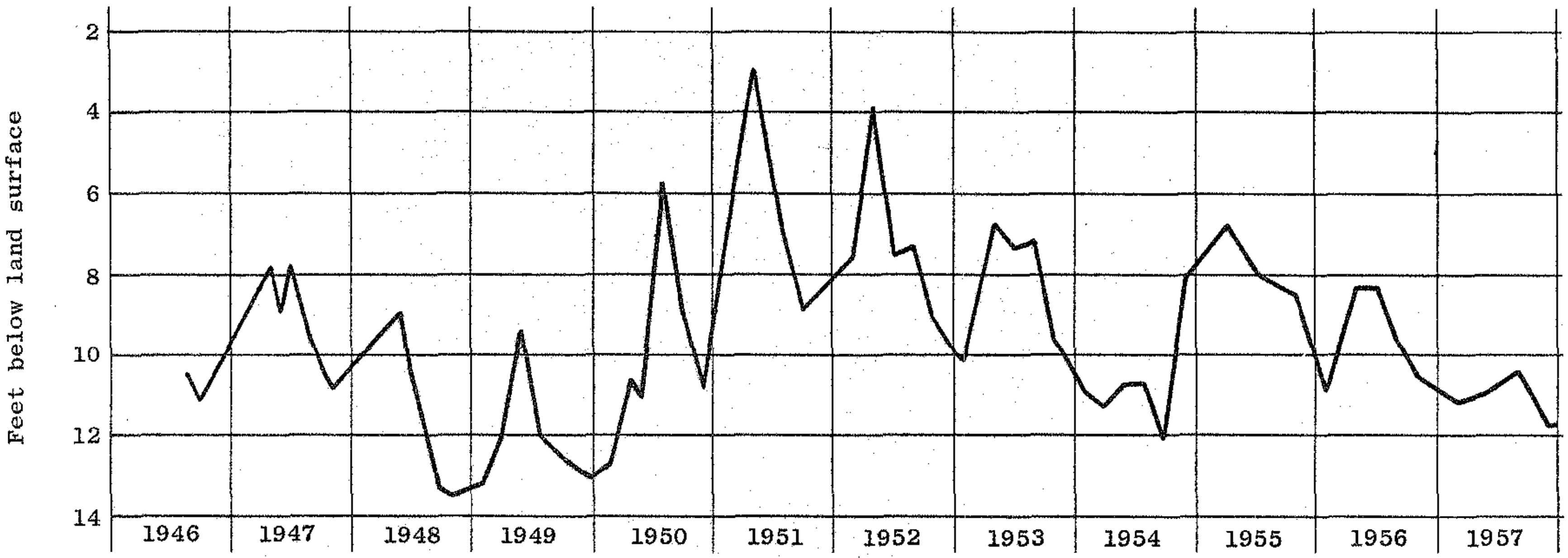

Figure 37.--Hydrograph of well Dg-13/13/15-3.

Dodge Co. A. A. Corrigan. NW¼SE¼ sec. 15, T. 13 N., R. 13 E. Drilled domestic artesian well in St. Peter sandstone, diam 6 in, reported depth 170 ft. Lsd, 909 ft above msl. MP, top of 6 in coupling on top of casing, 0.75 ft above lsd. Measured bi-monthly. All plotted.

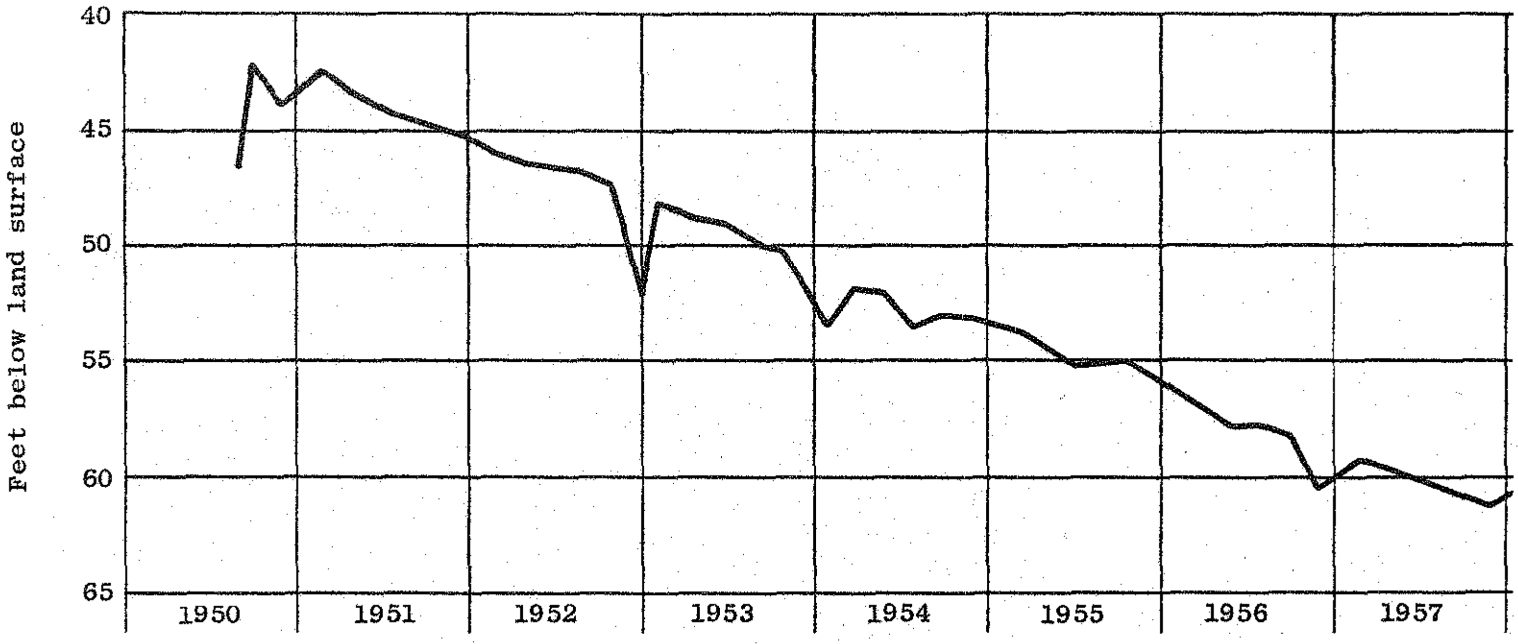

Figure 38.--Hydrograph of well Dr-26/23/22-11.

Door Co. Wilfred LeMense. NW¼SW¼ sec. 22, T. 26 N., R. 23 E. Drilled stock artesian well in St. Peter sandstone and possibly sandstones of Cambrian age, diam 6 in, reported depth 816 ft, cased to 60. Lsd, 630 ft above msl. MP, hole in side of casing, 1.0 ft above lsd. Measured bi-monthly. All plotted.

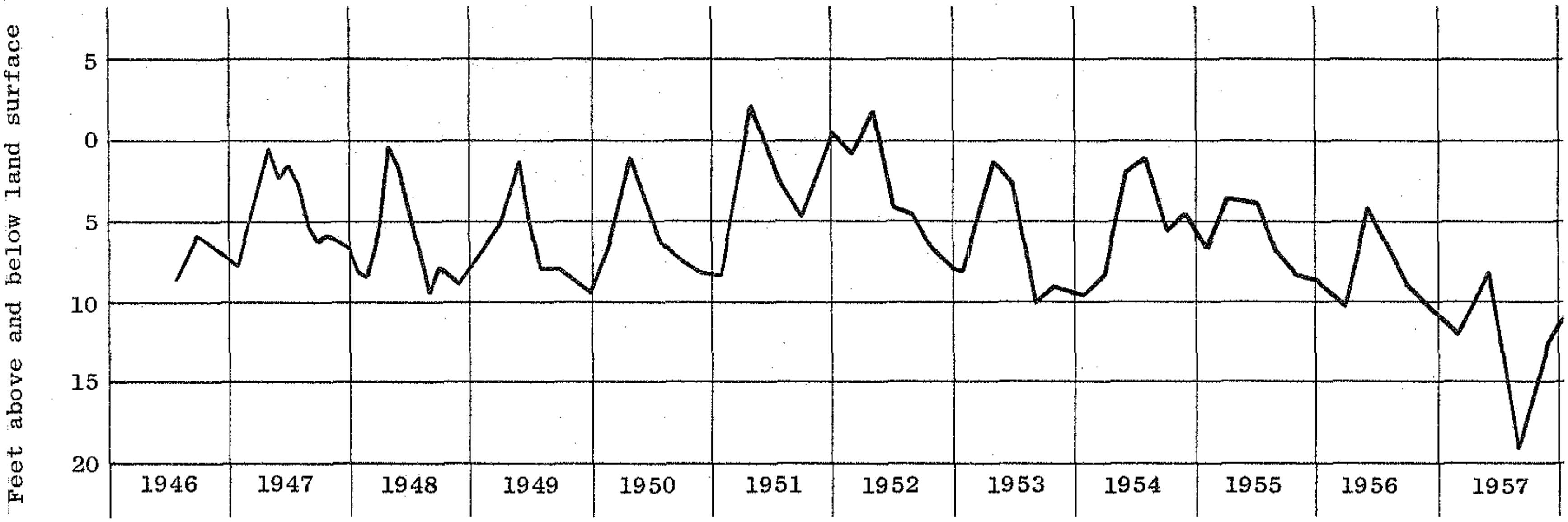

Figure 39.--Hydrograph of well Dr-27/26/8-5.

Door Co. City of Sturgeon Bay. NE$\frac{1}{4}$NW$\frac{1}{4}$ sec. 8, T. 27 N., R. 26 E. Drilled unused artesian well in Niagara dolomite, diam 12 in, depth 196 ft, cased to 156. Lsd, 582 ft above msl. MP, top of concrete, 2.1 ft above lsd. Measured bi-monthly. All plotted.

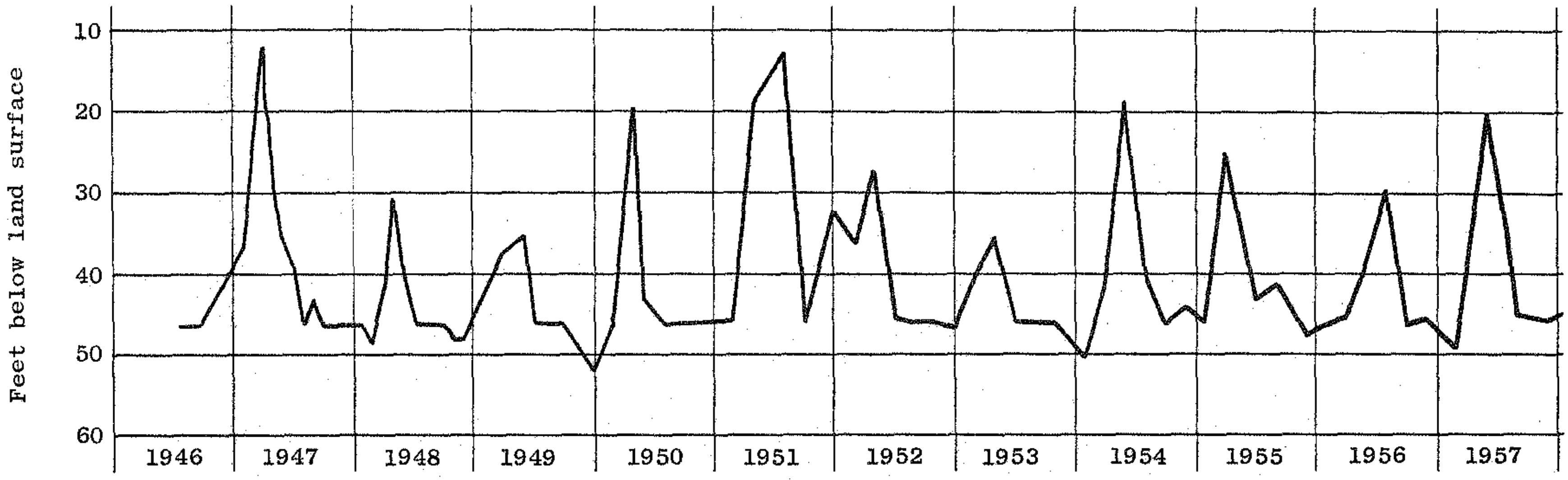

Figure 40.--Hydrograph of well Dr-29/27/30-7.

Door Co. Fred Peterson. NE¼NE¼ sec. 30, T. 29 N., R. 27 E. Drilled unused artesian well in Niagara dolomite, diam 4 in, depth 111 ft. MP, hole in pump base, 1.00 ft above lsd. Measured bi-monthly. All plotted.

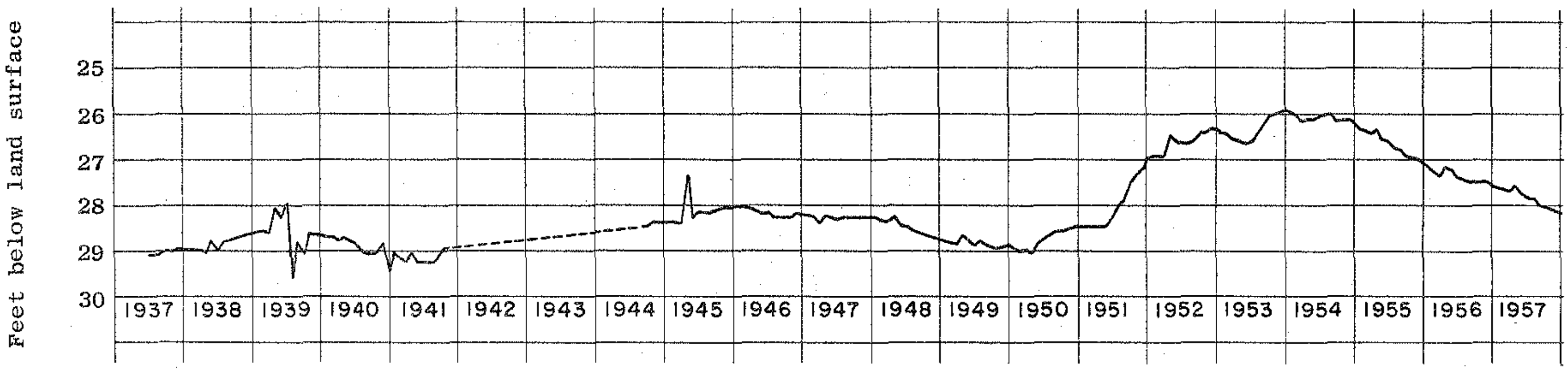

Figure 41.--Hydrograph of well Ds-47/10W/23-1.

Douglas Co. Wisconsin Conservation Dept. NE¼SE¼ sec. 23, T. 47 N., R. 10 W. Drilled observation artesian well in sand of Pleistocene age, diam 8 in, depth 40 ft, cased to 40. Lsd, 980 ft above msl. MP, pointer on float gage, 4.33 ft above lsd. Measured weekly. Lowest monthly plotted.

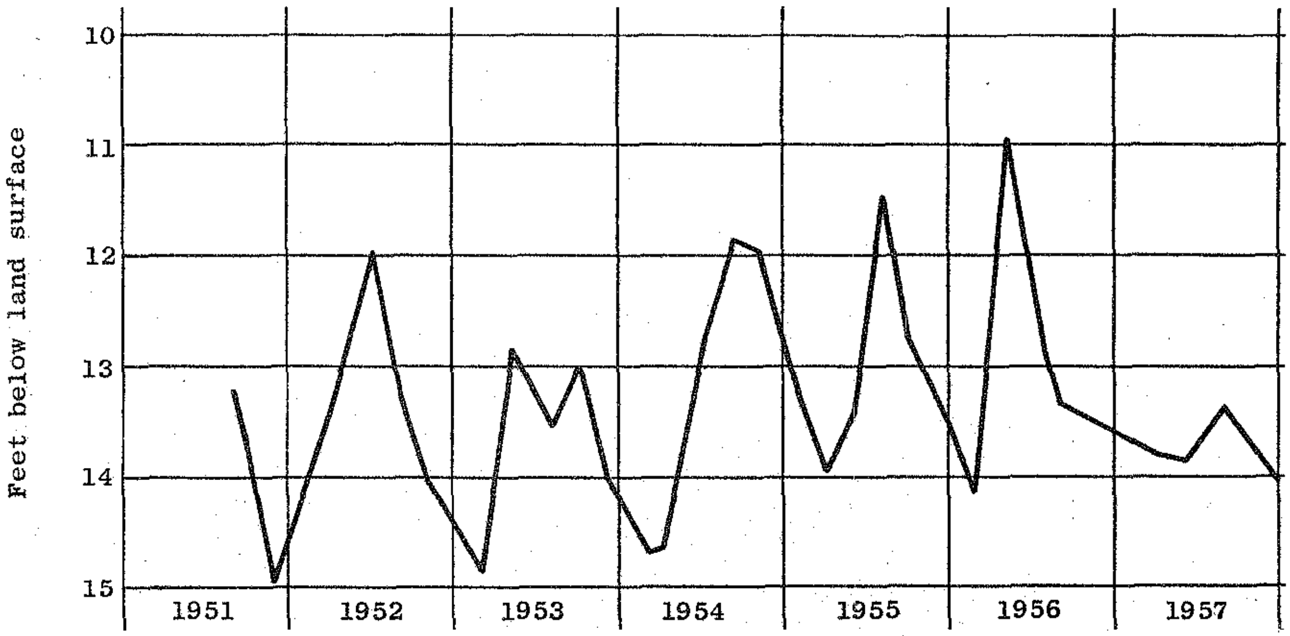

Figure 42.--Hydrograph of well EC-26/6W/32-13.

Eau Claire Co. Eau Claire County. SW¼SW¼ sec. 32, T. 26 N., R. 6 W. Driven unused watertable well in alluvium, diam 1¼ in, depth 26 ft, well point 24-26. MP, top of second block of cribbing, at lsd. Measured bi-monthly. All plotted.

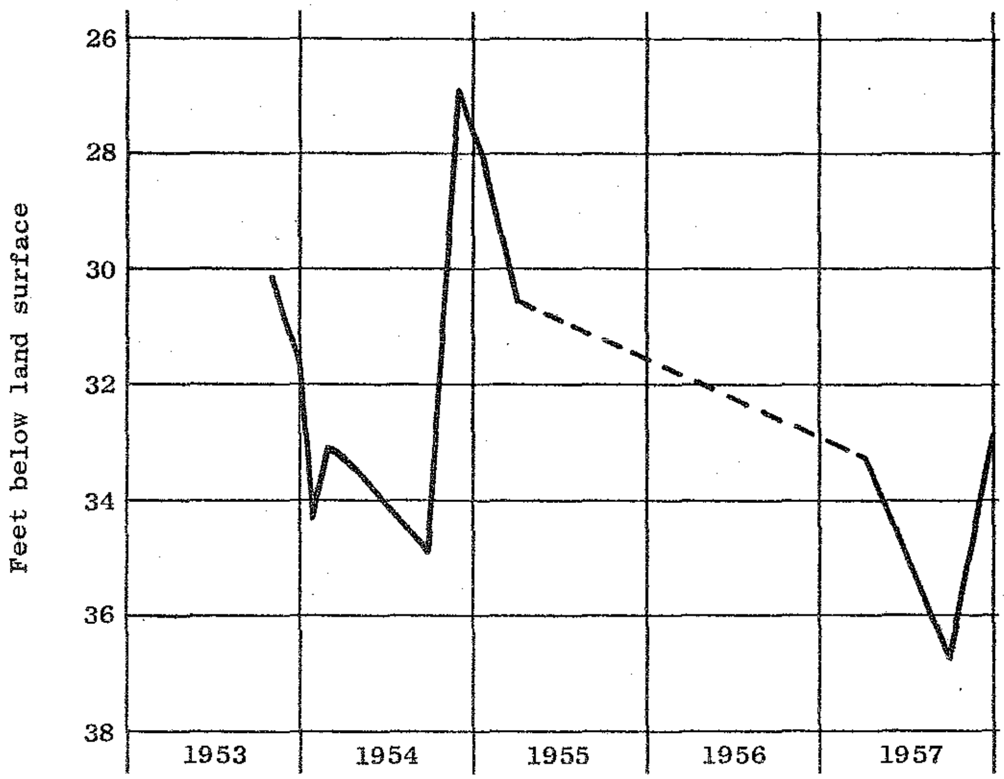

Figure 43.--Hydrograph of well FL-14/15/32-14.

Fond du Lac Co. City of Waupun. SW¼SE¼ sec. 32, T. 14 N., R. 15 E. Drilled public-supply artesian well in sandstone of Cambrian age, diam 10 in, reported depth 965 ft, cased to 140. Lsd, 887 ft above msl. MP, hole in northwest side of pump base, 3.0 ft above lsd. Measured bi-monthly. All plotted.

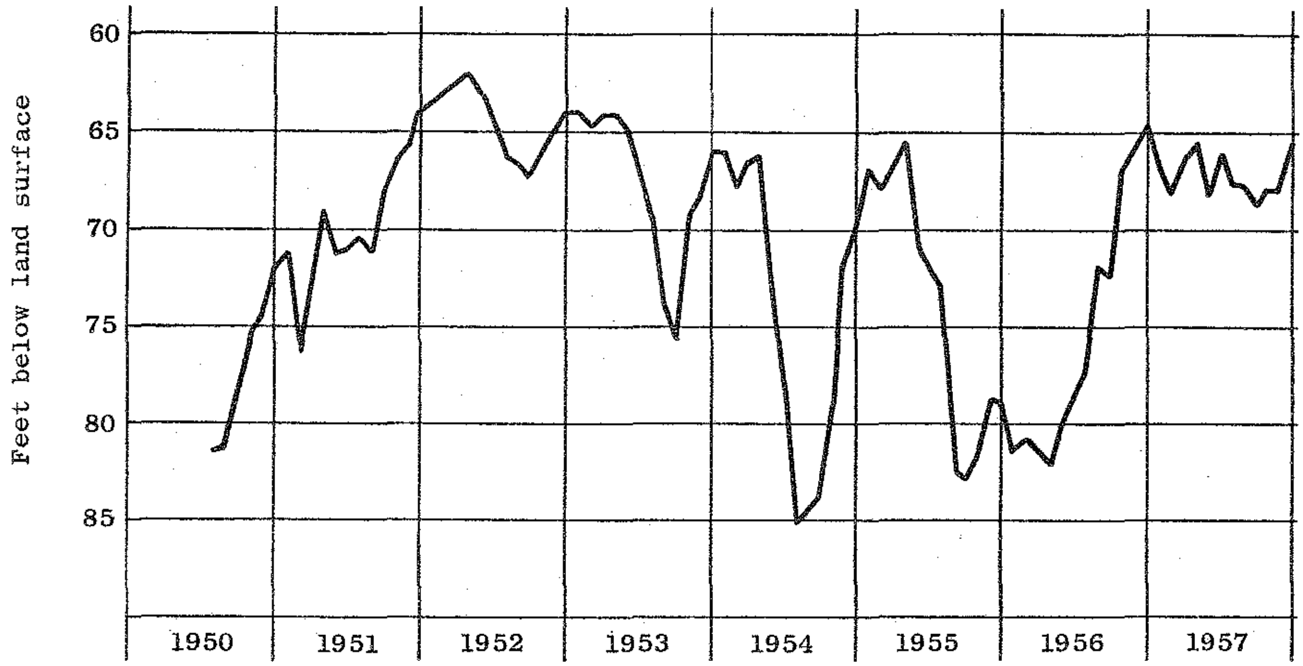

Figure 44A.--Hydrograph of well FL-15/17/3-20.

Fond du Lac Co. City of Fond du Lac. SW¼SW¼ sec. 3, T. 15 N., R. 17 E. Drilled unused artesian well in sandstones and dolomites of Cambrian and Ordovician ages, diam 6 in, reported depth 765 ft, cased to 60. Lsd, 750 ft above msl. MP, top of recorder shelf, 2.0 ft above lsd. Recording gage. Lowest monthly plotted.

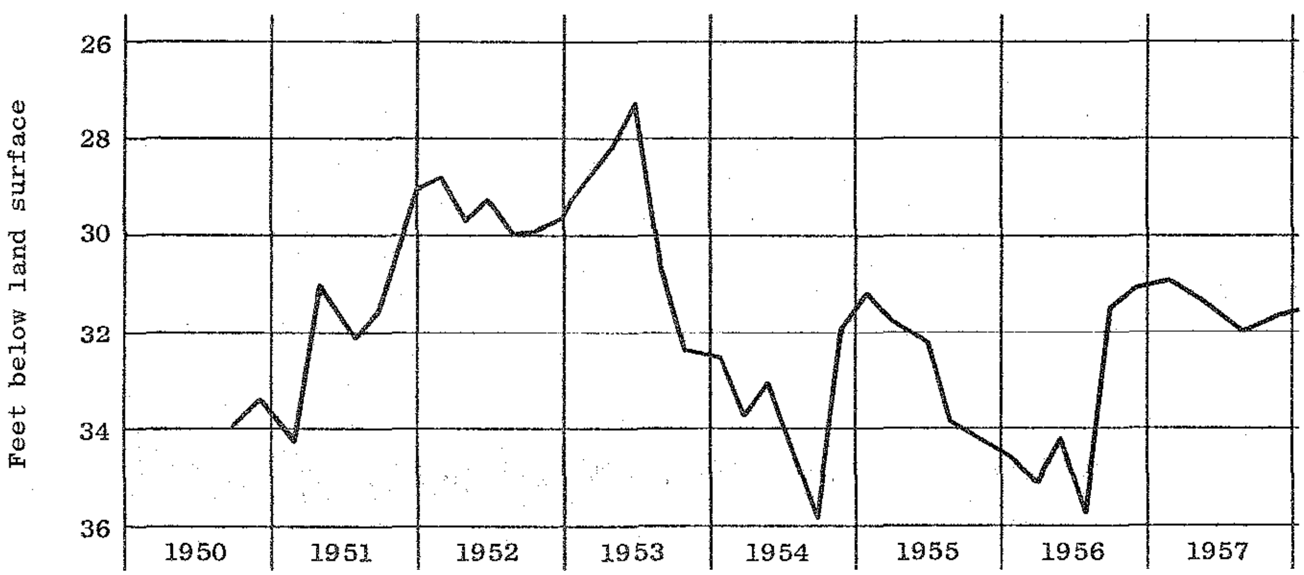

Figure 44B.--Hydrograph of well FL-16/17/33-21.

Fond du Lac Co. Wisconsin Central Railroad. NW¼SW¼ sec. 33, T. 16 N., R. 17 E. Drilled industrial artesian well in Galena dolomite and Platteville formation, diam 8 in, reported depth 360 ft. Lsd, 766 ft above msl. MP, top of casing, at lsd. Measured bi-monthly. All plotted.

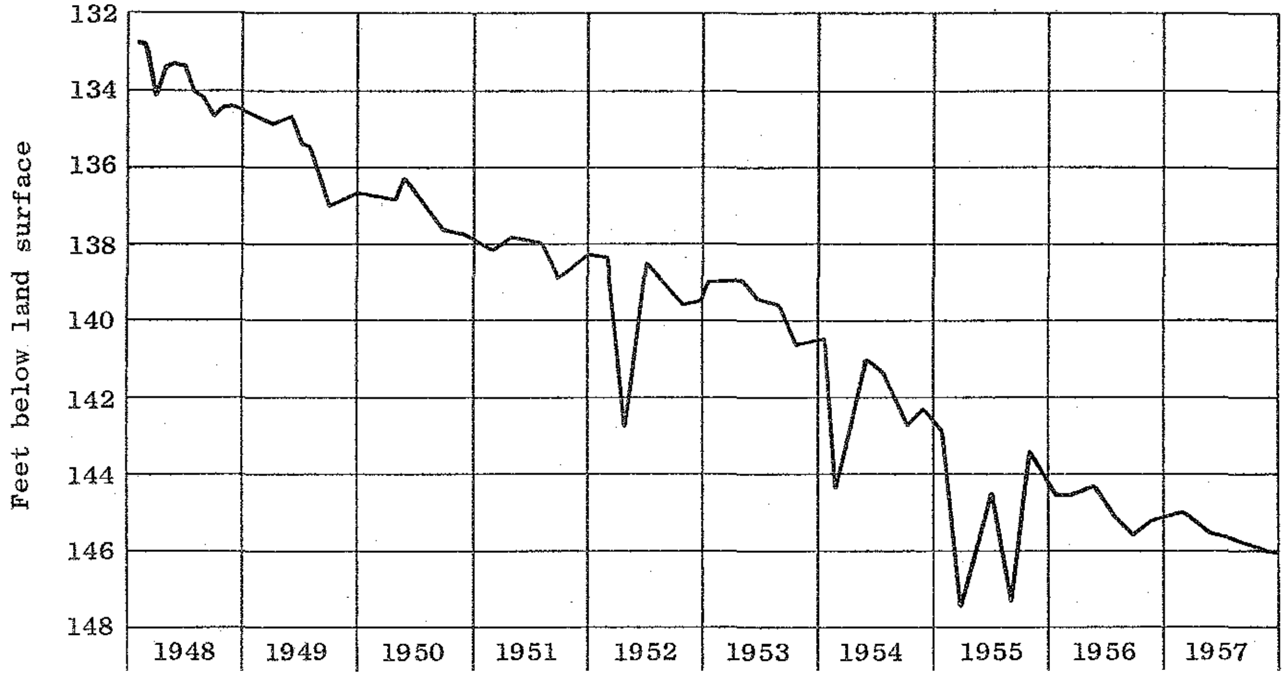

Figure 45A.--Hydrograph of well FL-17/19/30-19.

Fond du Lac Co. John Steffin. NW$\frac{1}{4}$NE$\frac{1}{4}$ sec. 30, T. 17 N., R. 19 E. Drilled stock artesian well in St. Peter sandstone, diam 6 to 4 in, reported depth 695 ft, cased to 490. Lsd, 895 ft above msl. MP, top of casing, 1.50 ft above lsd. Measured bi-monthly. All plotted.

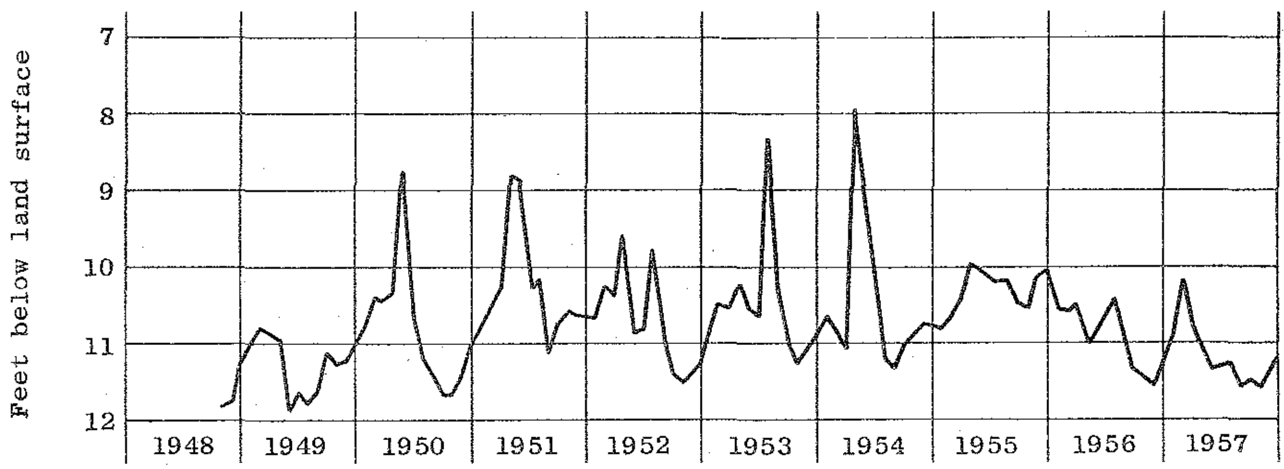

Figure 45B.--Hydrograph of well Fr-41/14/18-2.

Forest Co. (W. M. P. Brule River Profile well 5) Wisconsin State Highway Comm. NW$\frac{1}{4}$SE$\frac{1}{4}$ sec. 18, T. 41 N., R. 14 E. Driven observation water-table well in sand and gravel, diam $1\frac{1}{4}$ in, depth 18 ft, well point 15-18. Lsd, 1,551.69 ft above msl. MP, top of casing, 1.70 ft above lsd. Measured monthly. All plotted.

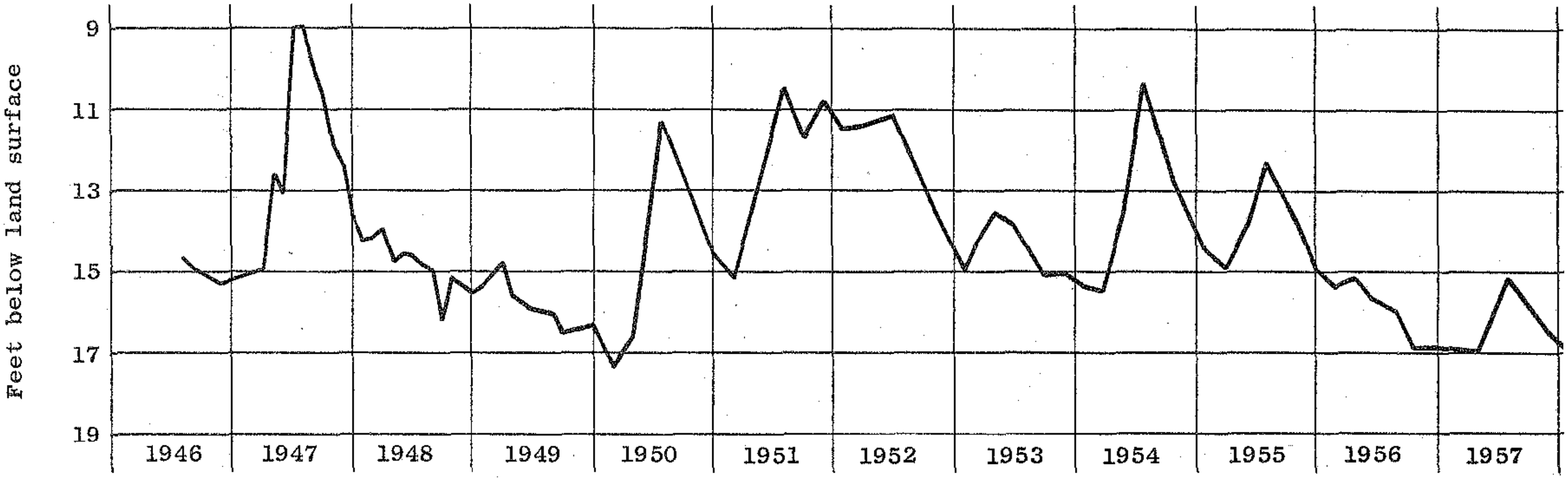

Figure 46.--Hydrograph of well Gr-5/2W/6-5.

Grant Co. Oscar Gilbertson. SW¼SE¼ sec. 6, T. 5 N., R. 2 W. Drilled unused water-table well in dolomite of Prairie du Chien group, diam 5 in, depth 35 ft, cased to 5. MP, edge of pump base, 0.50 ft above lsd. Measured bi-monthly. All plotted.

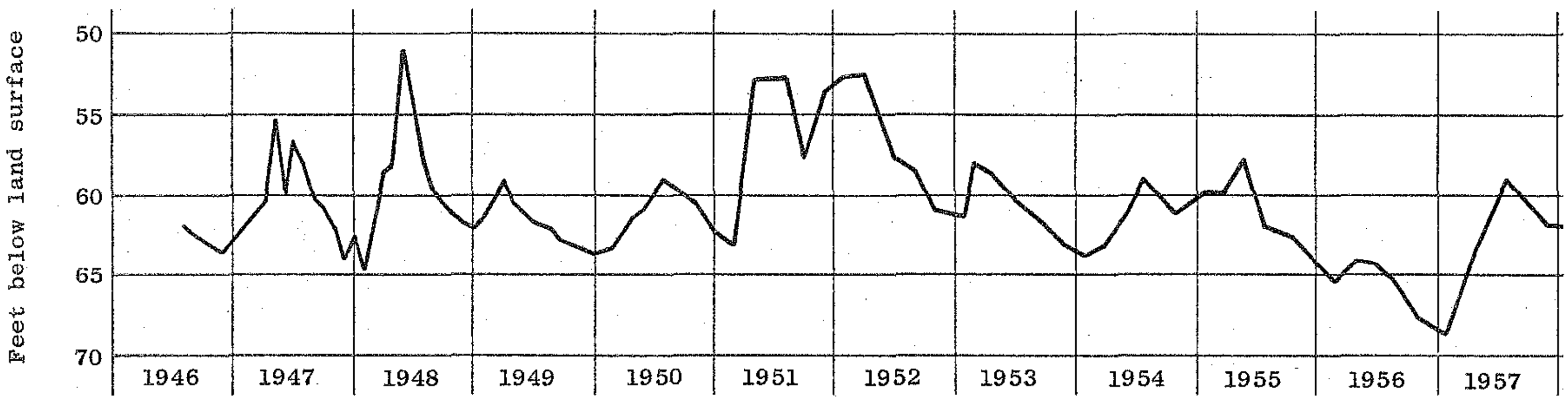

Figure 47.--Hydrograph of well Gn-2/7/21-1.

Green Co. Charles Segner. NW$\frac{1}{4}$NW$\frac{1}{4}$ sec. 21, T. 2 N., R. 7 E. Drilled unused water-table well in Platteville formation, diam 6 in, depth 71 ft. MP, hole in pump base, 0.50 ft above lsd. Measured bi-monthly. All plotted.

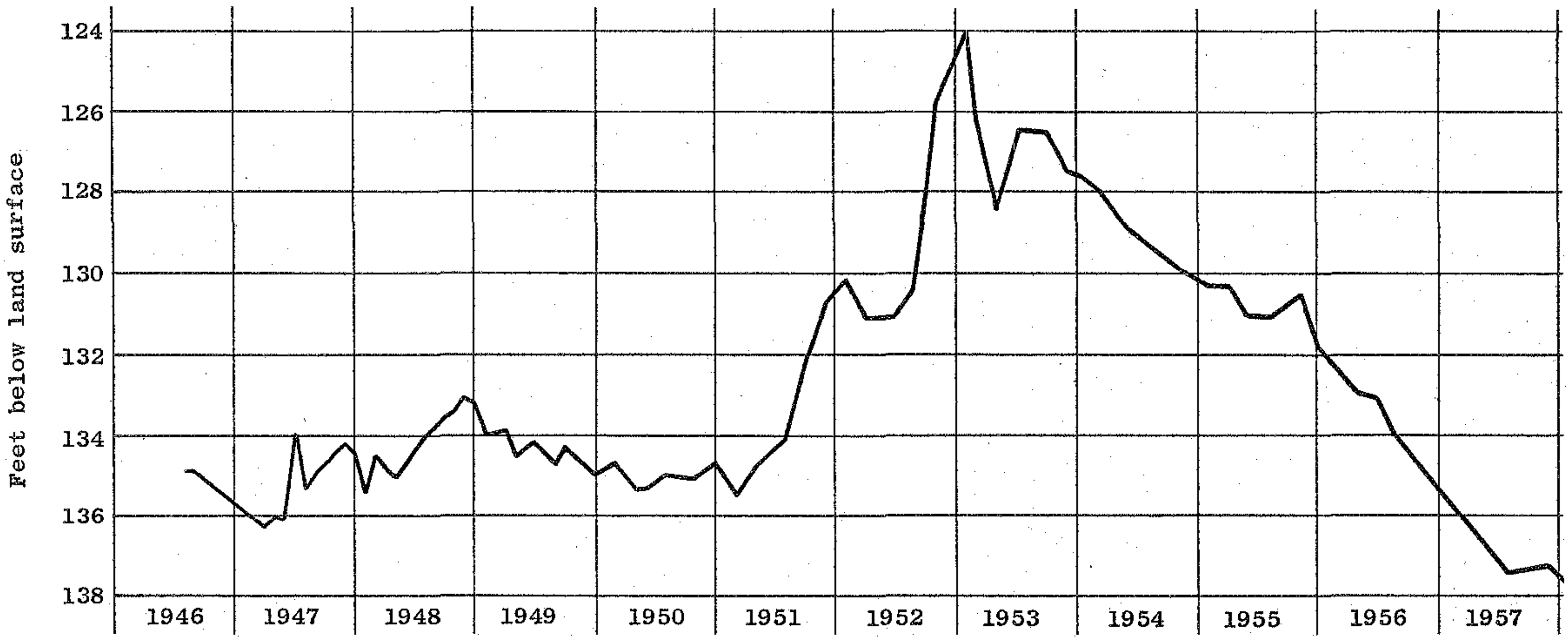

Figure 48.--Hydrograph of well Gn-3/6/18-2.

Green Co. Earl Waddington. NE¼NW¼ sec. 18, T. 3 N., R. 6 E. Drilled unused artesian well in St. Peter sandstone, diam 6 in. MP, hole in pump base, 0.5 ft above lsd. Measured bi-monthly. All plotted.

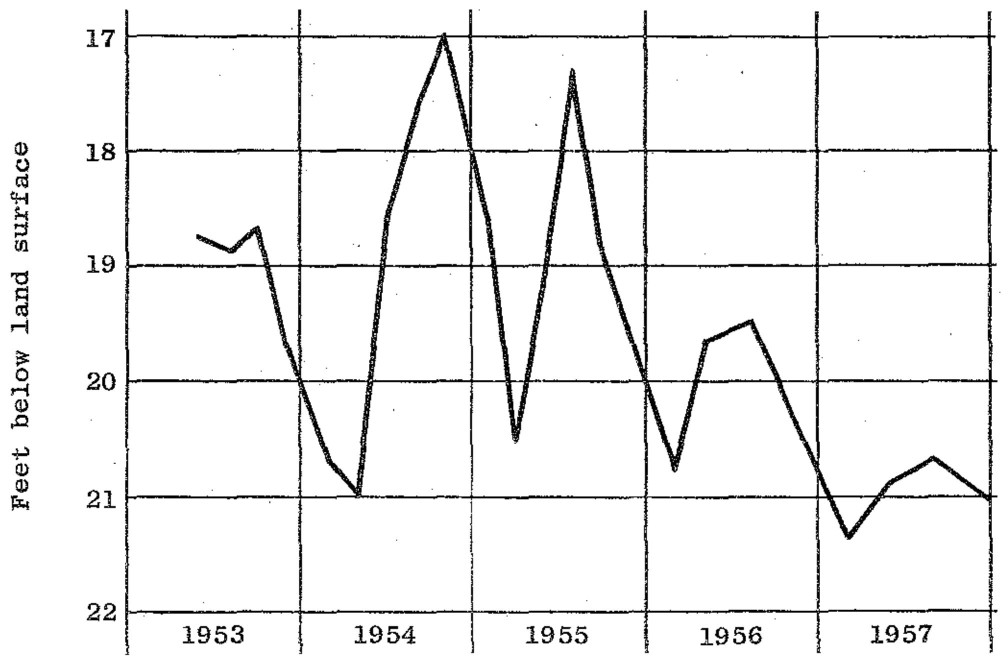

Figure 49.--Hydrograph of well Ja-20/3W/30-5.

Jackson Co. Henry Lange. NE¼SW¼ sec. 30, T. 20 N., R. 3 W. Drilled domestic artesian well in sandstone of Cambrian age, diam 10 in, reported depth 190 ft, cased to 54. MP, hole in pump base, at lsd. Measured bi-monthly. All plotted.

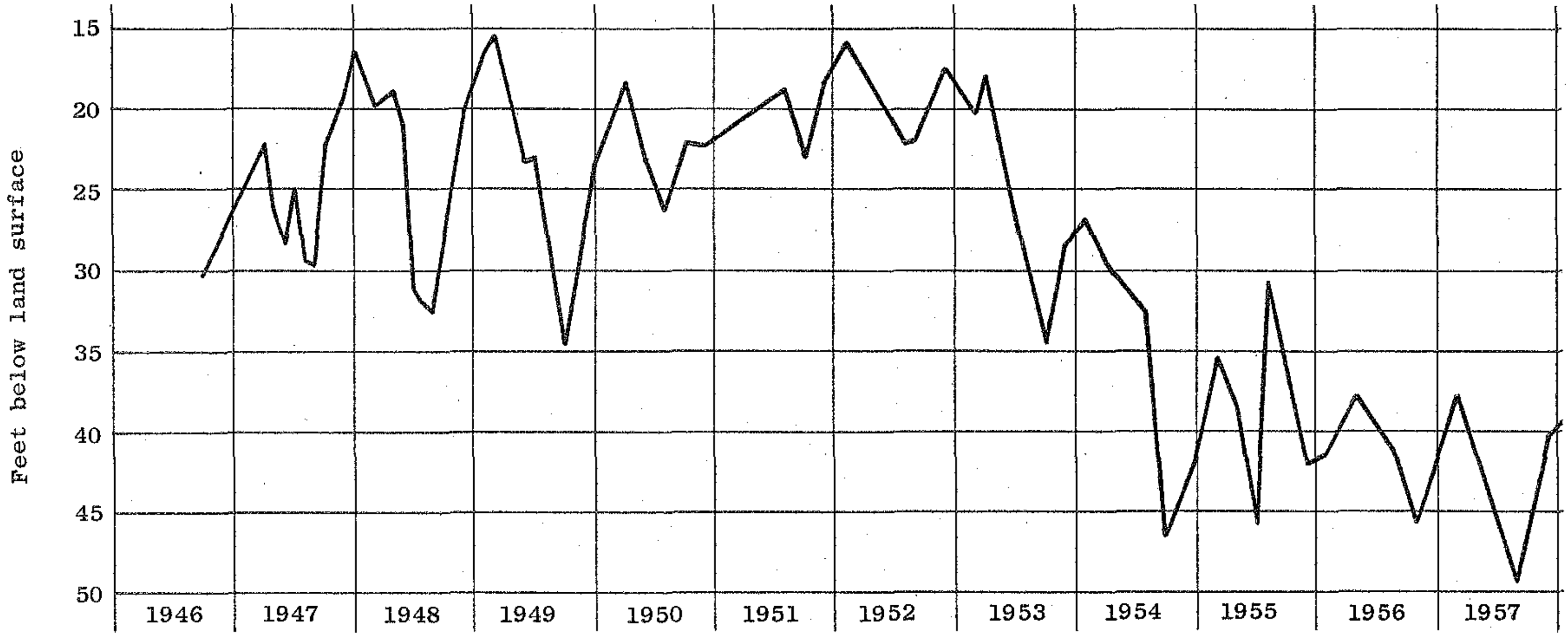

Figure 50.--Hydrograph of well Je-7/14/25-9.

Jefferson Co. Chicago & North Western Ry. SE¼SW¼ sec. 25, T. 7 N., R. 14 E. Drilled railroad artesian well in sandstone of Cambrian age, diam 8 in, reported depth 716 ft, cased to 326. Lsd, 813 ft above msl. MP, pump base, 2.10 ft above lsd. Measured bi-monthly. All plotted.

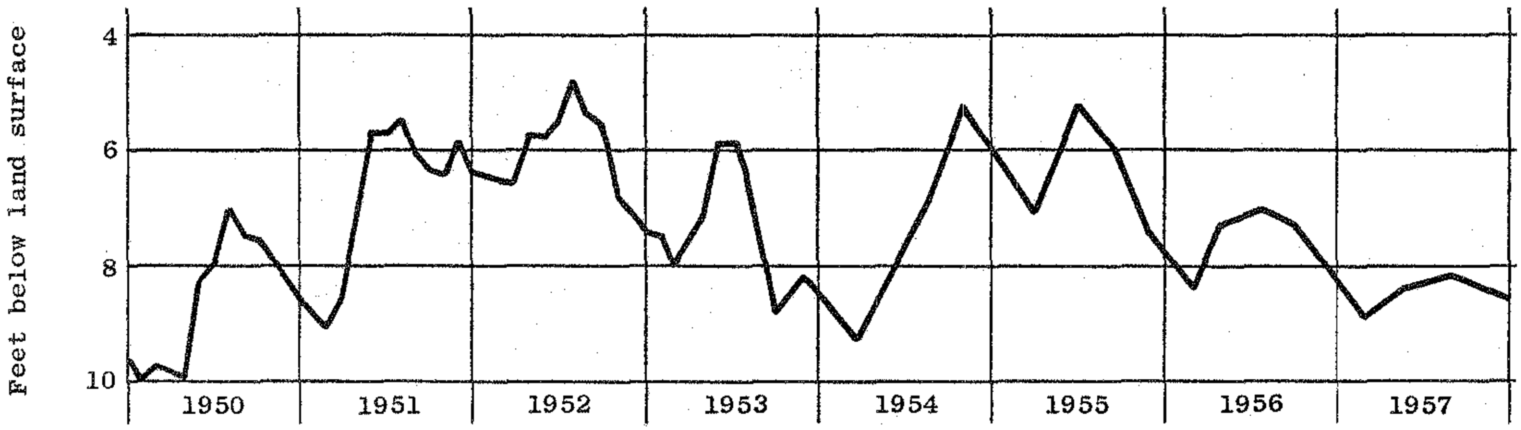

Figure 51.--Hydrograph of well Ju-17/2/21-8.

Juneau Co. Camp Douglas. SW¼SW¼ sec. 21, T. 17 N., R. 2 E. Drilled unused water-table well in sandstone of Cambrian age, diam 4 in, depth 64 ft. MP, top of casing, 1.00 ft above lsd. Measured bi-monthly. All plotted. Recording gage before July 1953.

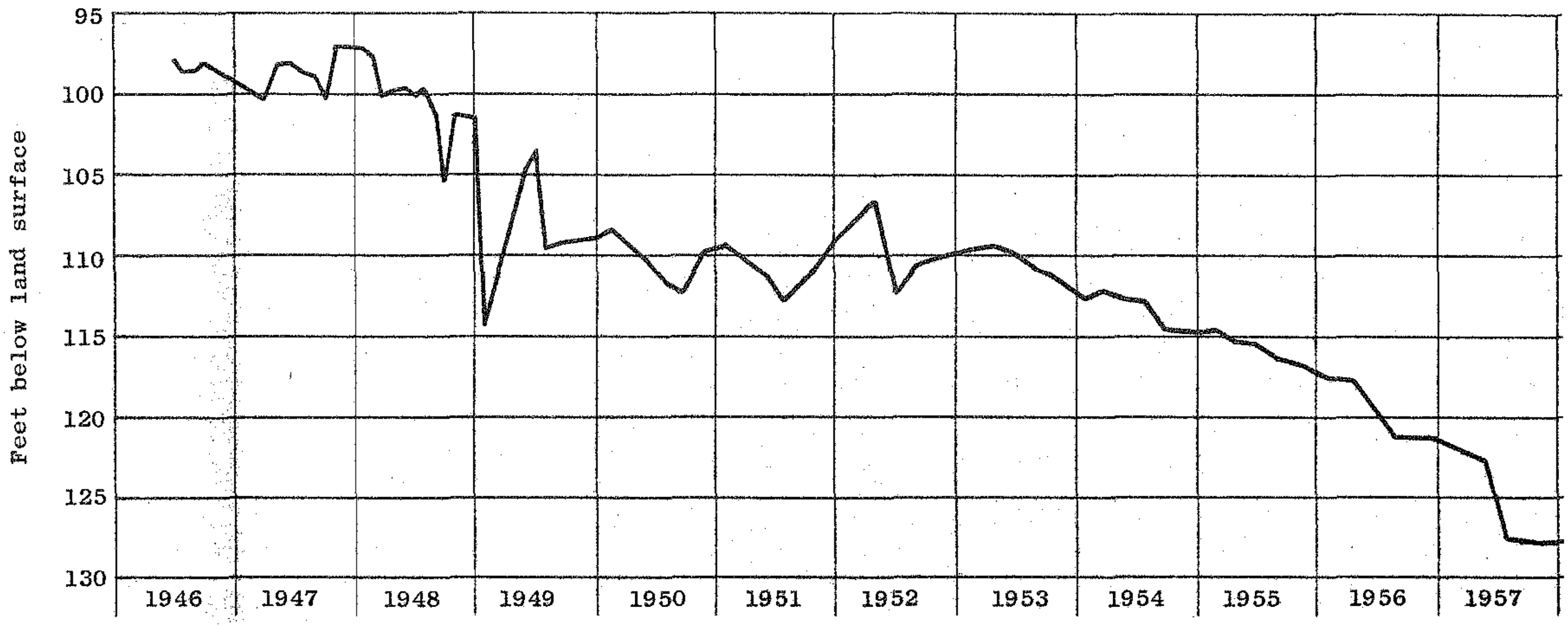

Figure 52.--Hydrograph of well Ke-1/21/8-3.

Kenosha Co. Bristol Sales and Service. SW¼SW¼ sec. 8, T. 1 N., R. 21 E. Drilled domestic artesian well in St. Peter sandstone and Galena dolomite, diam 8 in, reported depth 878 ft. Lsd, 770 ft above msl. MP, top of casing, 4.85 ft below lsd. Measured bi-monthly. All plotted.

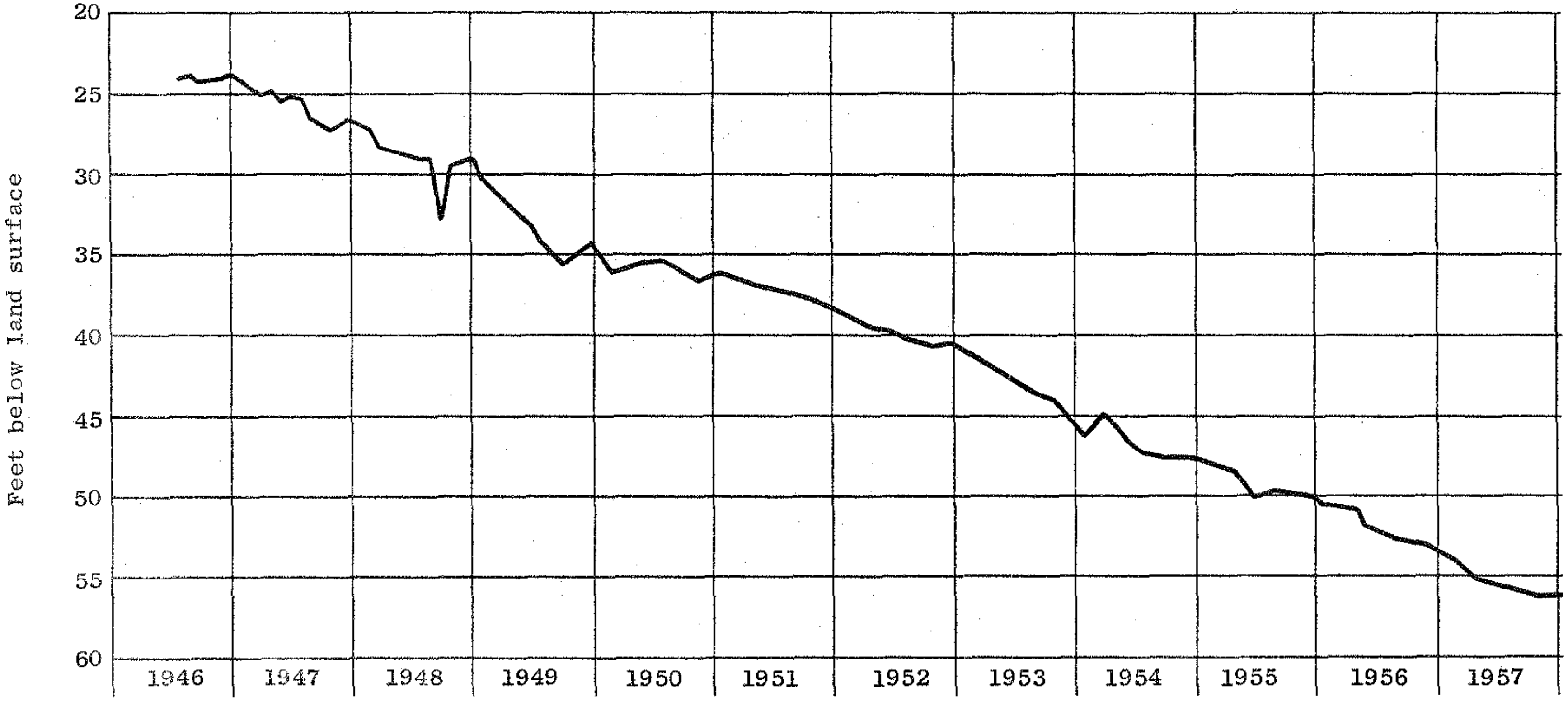

Figure 53.--Hydrograph of well Ke-2/22/11-6.

Kenosha Co. Kenosha County. NW$\frac{1}{4}$NW$\frac{1}{4}$ sec. 11, T. 2 N., R. 22 E. Drilled irrigation artesian well in sandstone of Cambrian age, diam 10 to 8 in, reported depth 1,751 ft, cased to 492. Lsd, 639 ft above msl. MP, top of casing, 0.80 ft above lsd. Measured bi-monthly. All plotted.

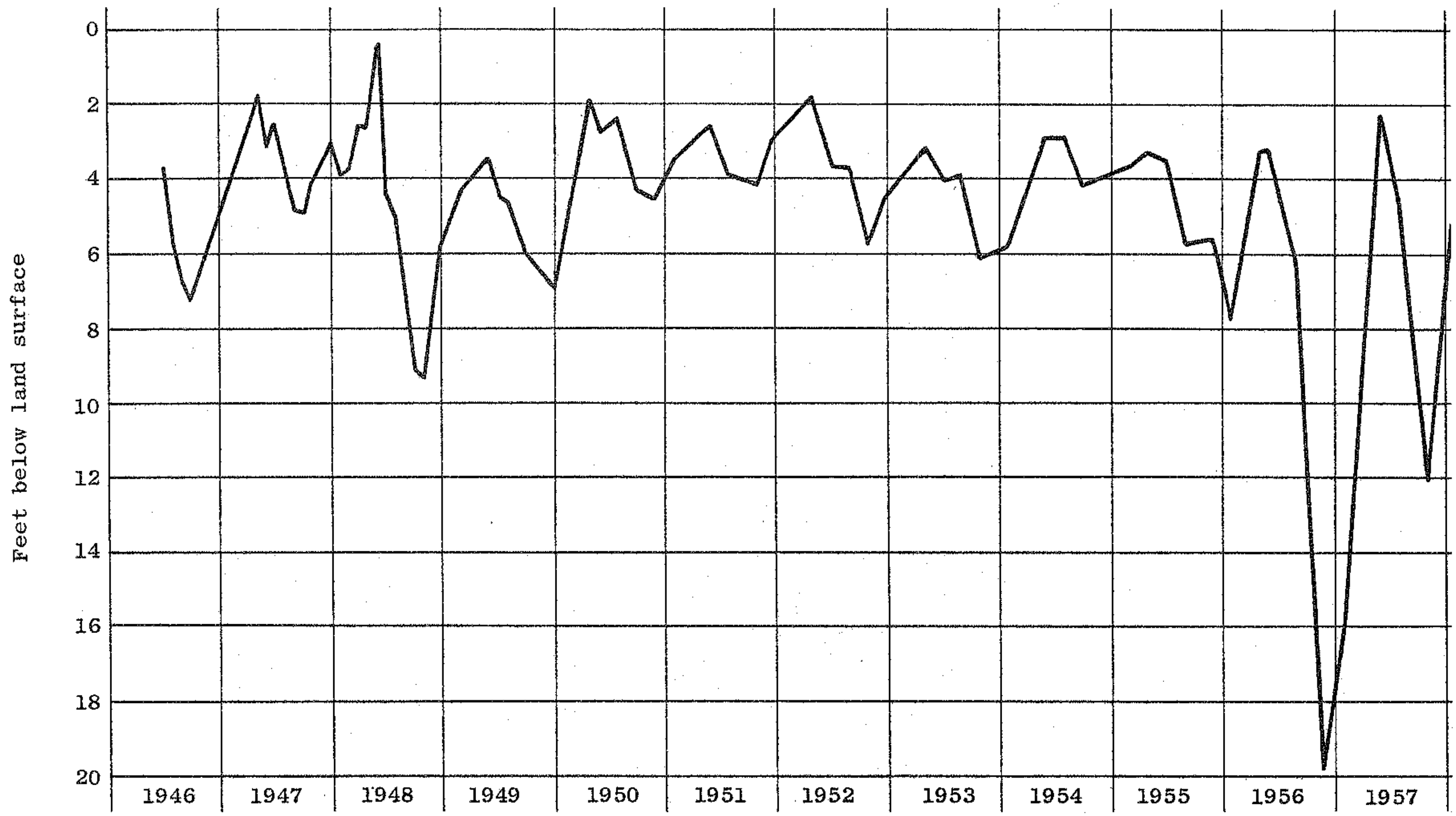

Figure 54.--Hydrograph of well Ke-2/22/20-5.

Kenosha Co. J. Bishop. SE¼SE¼ sec. 20, T. 2 N., R. 22 E. Dug unused water-table well in deposits of Pleistocene age, diam 4 ft, depth 28 ft. Lsd, 695 ft above msl. MP, pump base, 0.8 ft above lsd. Measured bi-monthly. All plotted.

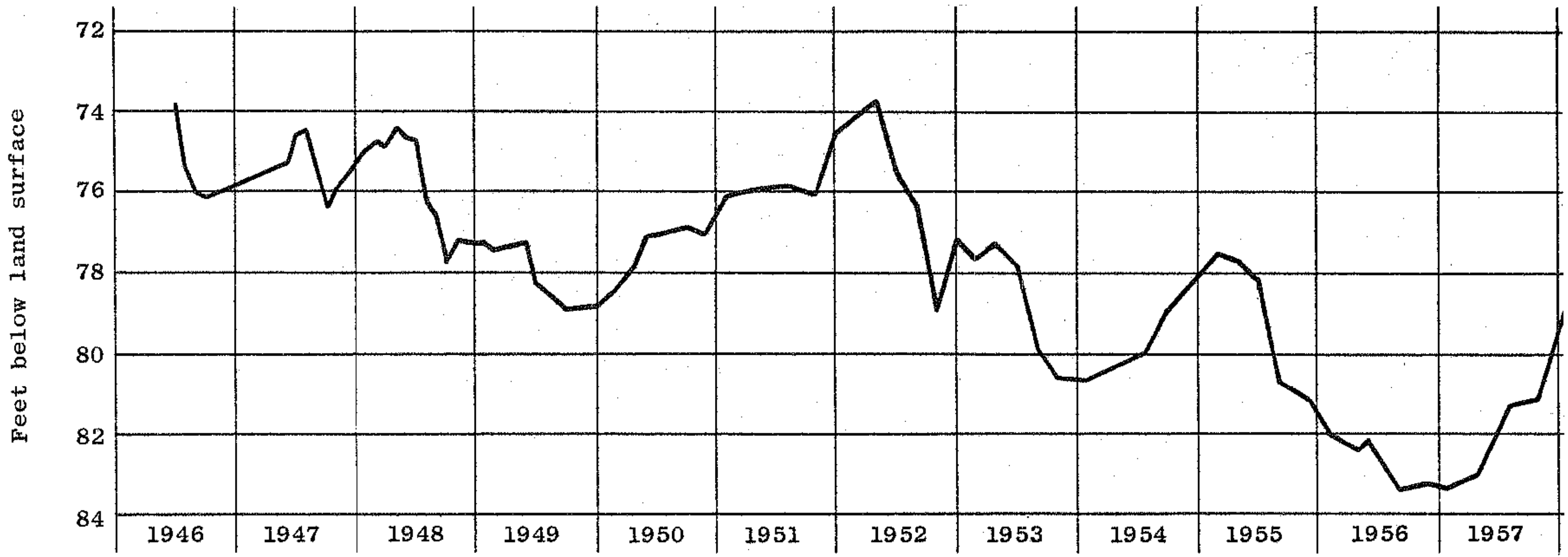

Figure 55.--Hydrograph of well Ke-2/22/27-4.

Kenosha Co. Sunset Ridge Memorial Park. NW$\frac{1}{4}$SE$\frac{1}{4}$ sec. 27, T. 2 N., R. 22 E. Drilled domestic and irrigation water-table well in Niagara dolomite, diam 6 in, reported depth 190 ft. Lsd, 725 ft above msl. MP, top of casing, 7.00 ft below lsd. Measured bi-monthly. All plotted.

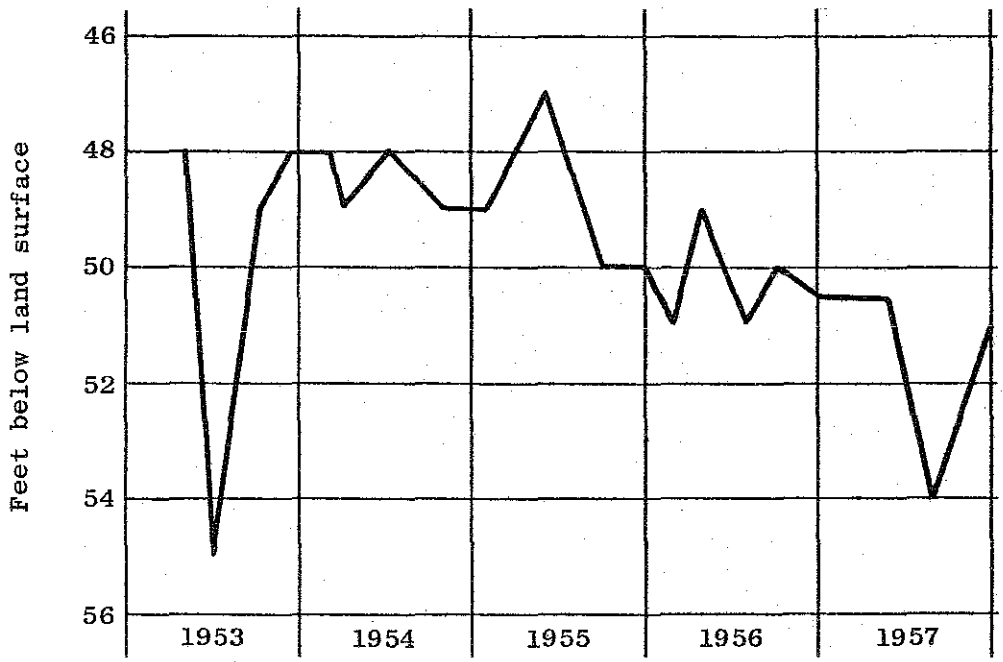

Figure 56.--Hydrograph of well LC-17/7W/7-8.

La Crosse Co. Holmen Canning Co. NW¼SE¼ sec. 7, T. 17 N., R. 7 W. Drilled industrial artesian well in sandstone of Cambrian age, diam 6 in, reported depth 398 ft. Lsd, 724 ft above msl. MP, top of pump base, 2.0 ft above lsd. Measured bi-monthly. All plotted.

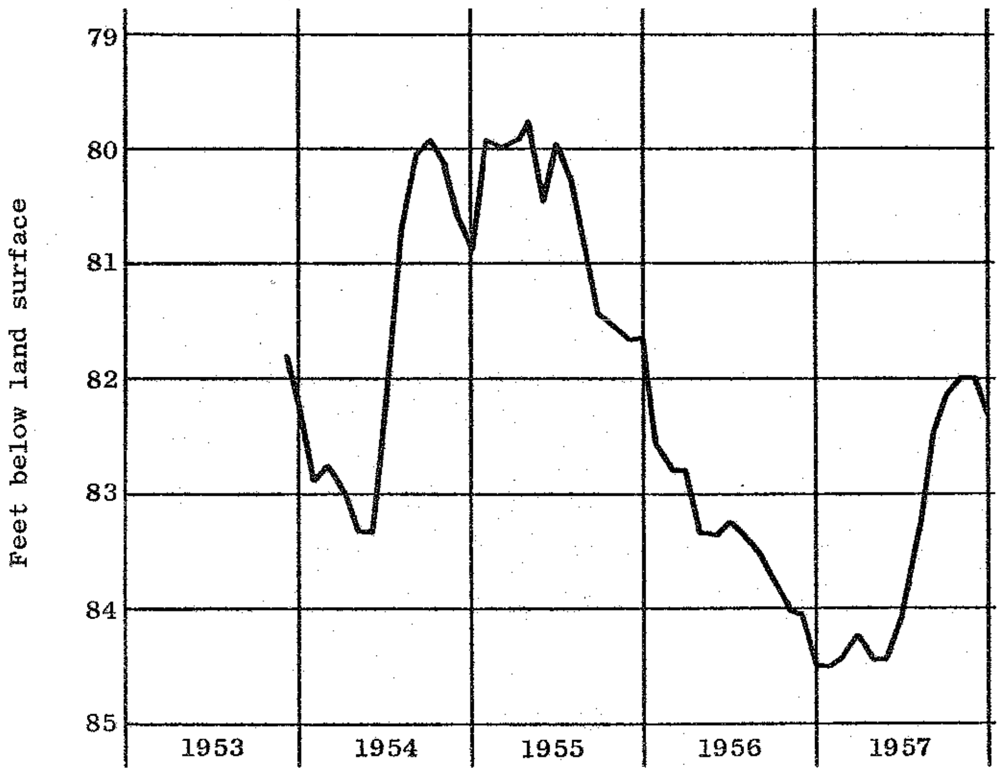

Figure 57.--Hydrograph of well Lf-1/2/17-95.

Lafayette Co. B. H. Mullen. SE¼NW¼ sec. 17, T. 1 N., R. 2 E. Dug unused mine shaft in Galena dolomite, size 8 by 15 ft, depth 164 ft, curbed to 15. Lsd, 988 ft above msl. MP, top of concrete, at lsd. Recording gage. Lowest monthly plotted.

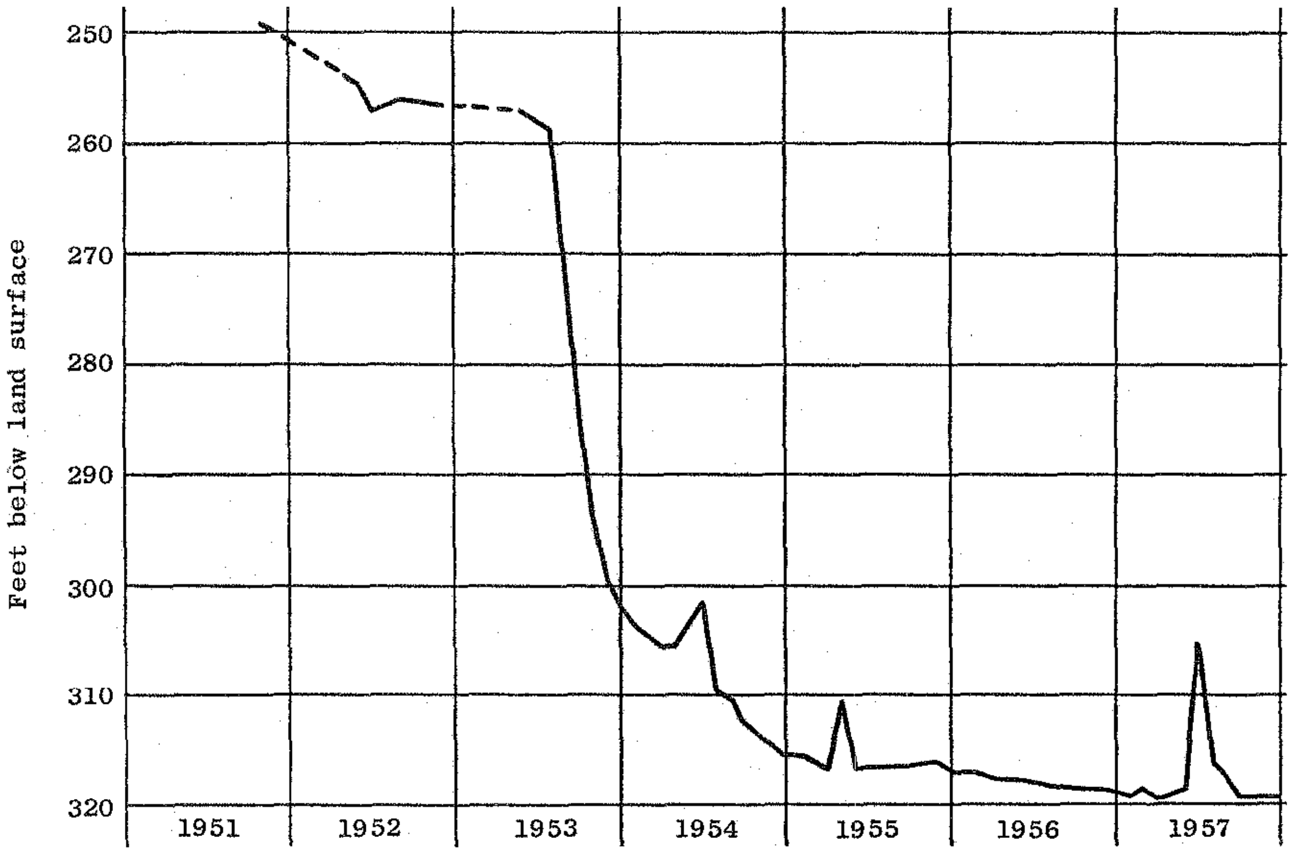

Figure 58.--Hydrograph of well Lf-1/2/22-36.

Lafayette Co. Calumet & Hecla Copper Co. SW¼NE¼ sec. 22, T. 1 N., R. 2 E. Drilled unused artesian well in Galena dolomite, diam 12 in, reported depth 340 ft. Lsd, 1,122 ft above msl. MP, 1.0 ft above lsd. Recording gage. Lowest monthly plotted.

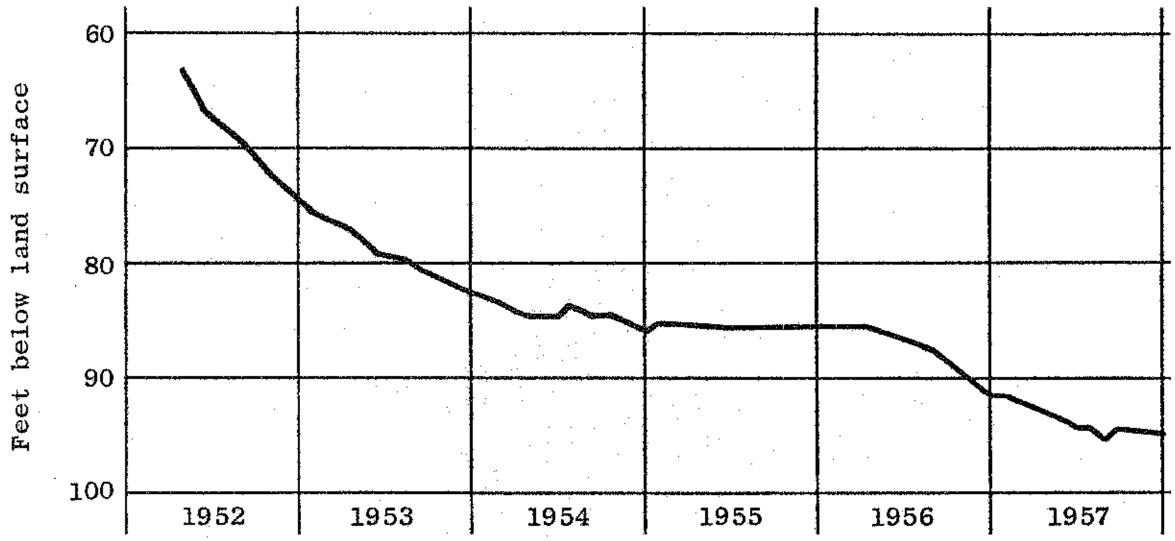

Figure 59.--Hydrograph of well Lf-1/2/33-57.

Lafayette Co. Coulthard Estate. Shullsburg. NW¼NW¼ sec. 33, T. 1 N., R. 2 E. Drilled unused artesian well in Galena dolomite and Platteville formation, diam 10 in, reported depth 265 ft, cased to 16. Lsd, 1,000 ft above msl. MP, top of casing, 3.00 ft above lsd. Recording gage. Lowest monthly plotted.

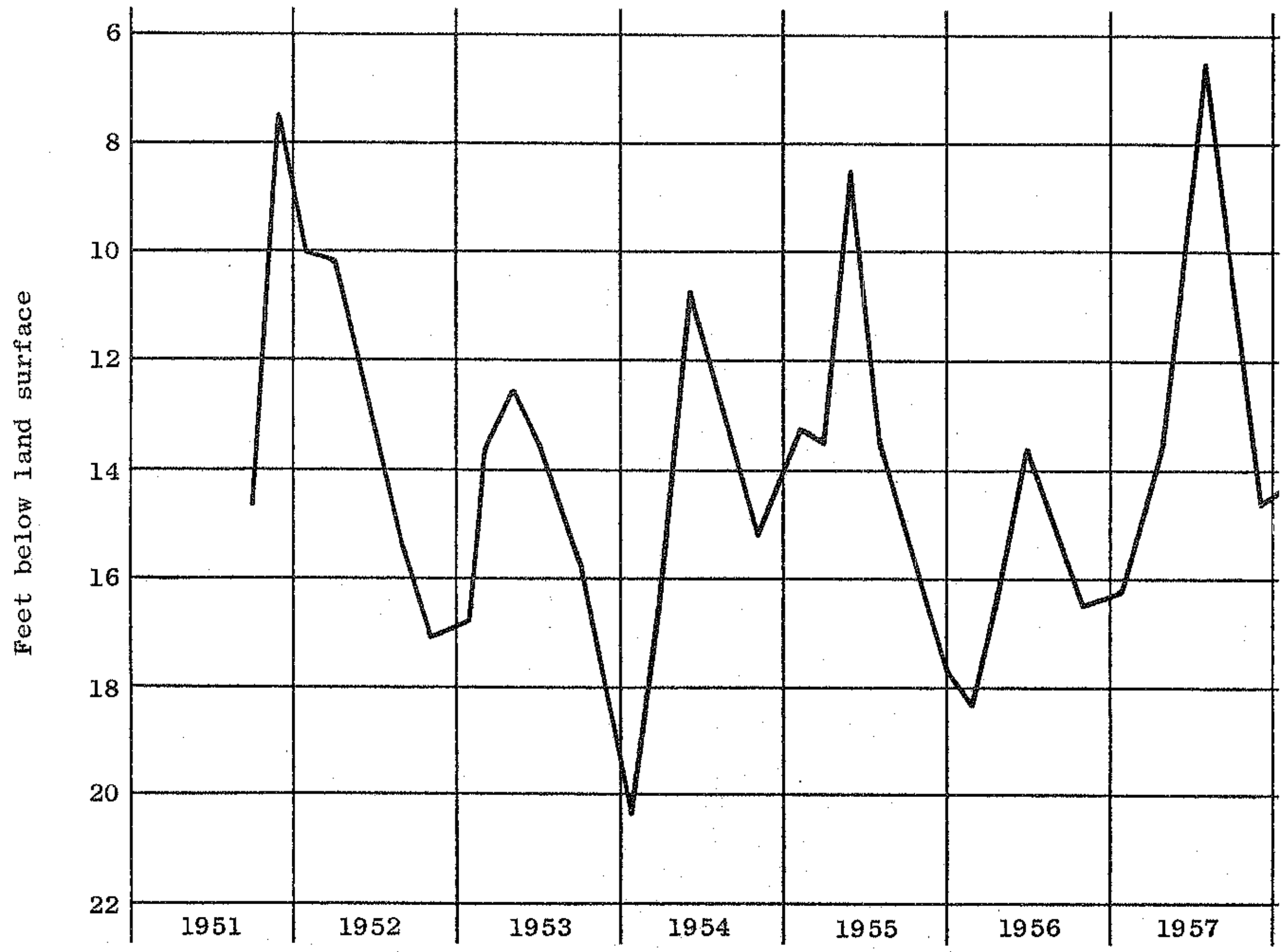

Figure 60.--Hydrograph of well Lf-1/2/34-13.

Lafayette Co. Viola Jeffery Lamont. NE¼NE¼ sec. 34, T. 1 N., R. 2 E. Drilled stock water-table well in Maquoketa shale, diam 6 in, reported depth 175 ft. Lsd, 1,075 ft above msl. MP, hole in pump base, 1.0 ft above lsd. Measured bi-monthly. All plotted.

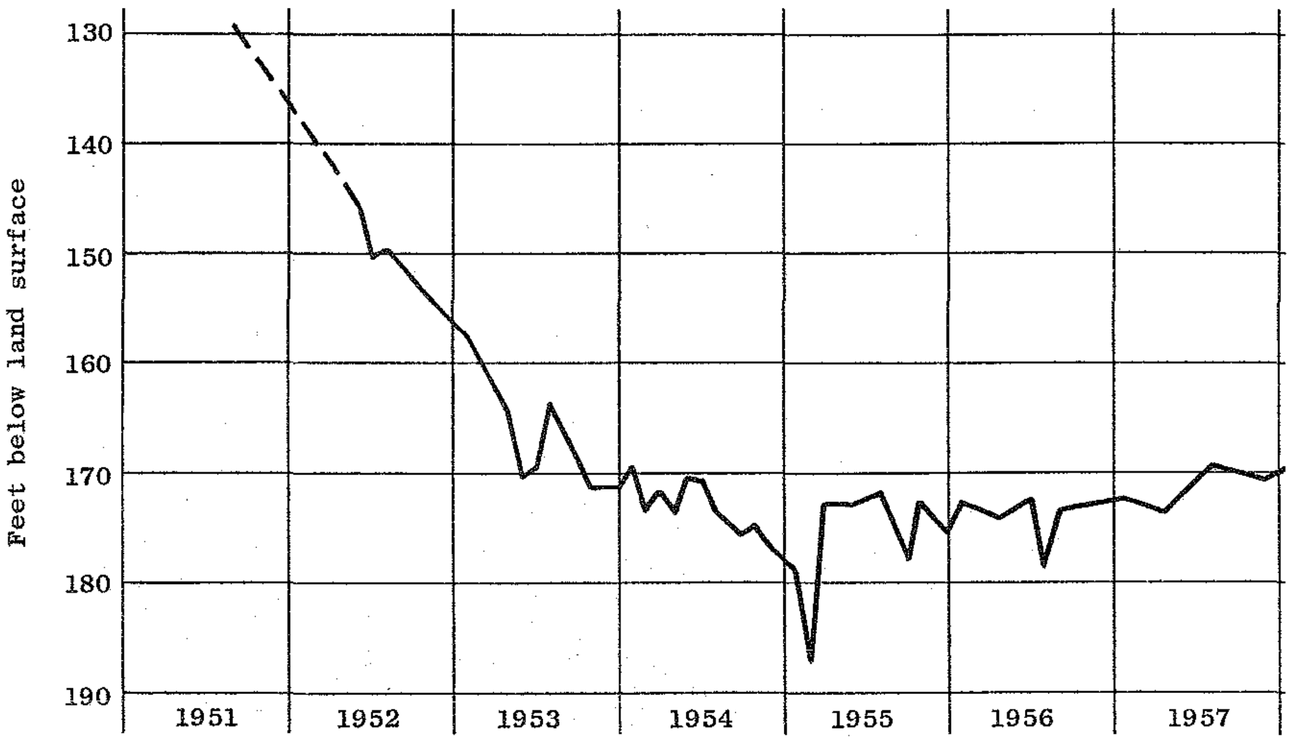

Figure 61A.--Hydrograph of well Lf-1/2/34-14.

Lafayette Co. Viola Jeffery Lamont. NE¼NE¼ sec. 34, T. 1 N., R. 2 E. Drilled domestic and stock water-table well in Galena dolomite, diam 6 in, reported depth 340 ft, cased to 77. Lsd, 1,076 ft above msl. MP, hole in cap, 3.0 ft below lsd. Measured bi-monthly. All plotted.

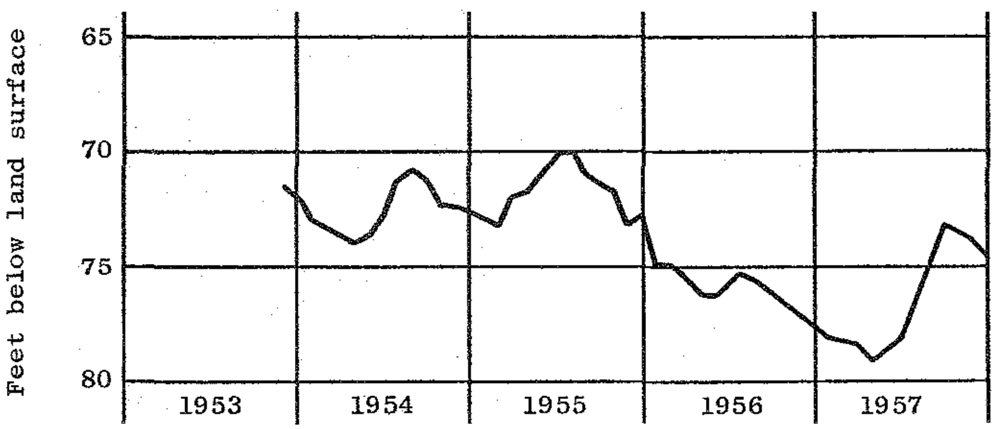

Figure 61B.--Hydrograph of well Lf-1/2/35-121.

Lafayette Co. Arthur Hancock. SE¼SE¼ sec. 35, T. 1 N., R. 2 E. Drilled unused artesian well in Galena dolomite, diam 6 in, depth 237 ft, cased to 20. Lsd, 1,030 ft above msl. MP, top south side of casing, 1.00 ft above lsd. Recording gage. Lowest monthly plotted.

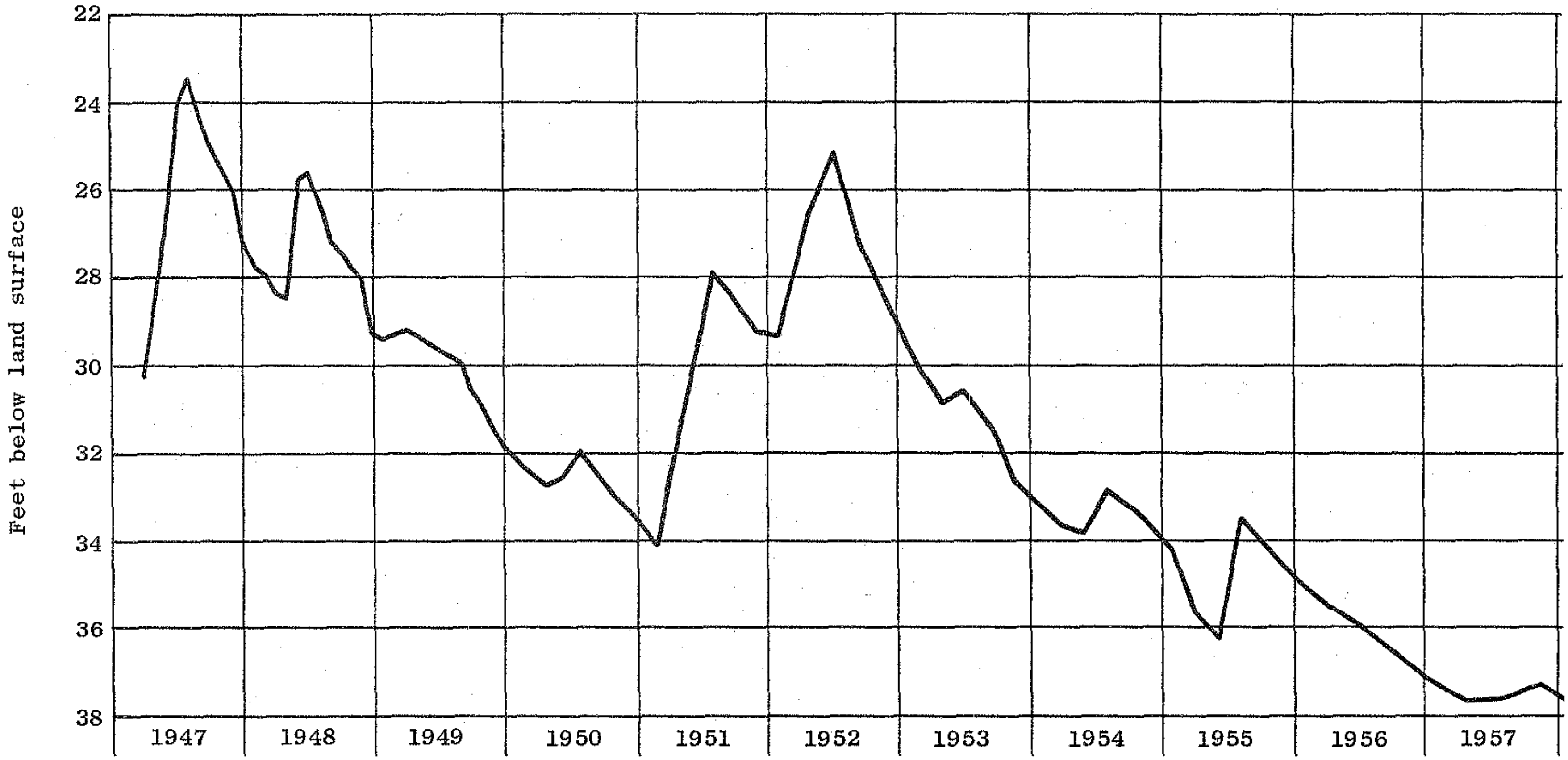

Figure 62.--Hydrograph of well Lf-2/1/4-11.

Lafayette Co. Ed Wiegel. SE¼SE¼ sec. 4, T. 2 N., R. 1 E. Drilled unused water-table well in Galena dolomite, diam 6 in. MP, edge of pump base, 1.0 ft above lsd. Measured bi-monthly. All plotted.

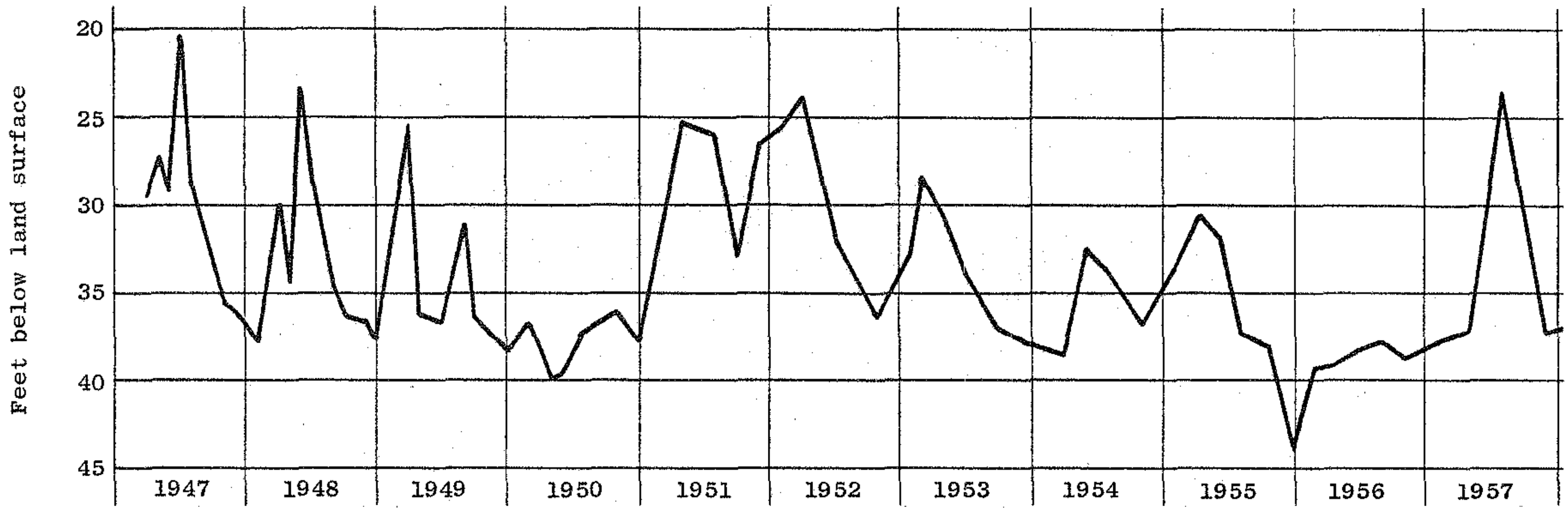

Figure 63.--Hydrograph of well Lf-2/4/33-12.

Lafayette Co. Pearl Ogelthre and others. SE¼SW¼ sec. 33, T. 2 N., R. 4 E. Drilled unused water-table well in Platteville formation and St. Peter sandstone, diam 6 in. MP, edge of casing, 0.5 ft above lsd. Measured bi-monthly. All plotted.

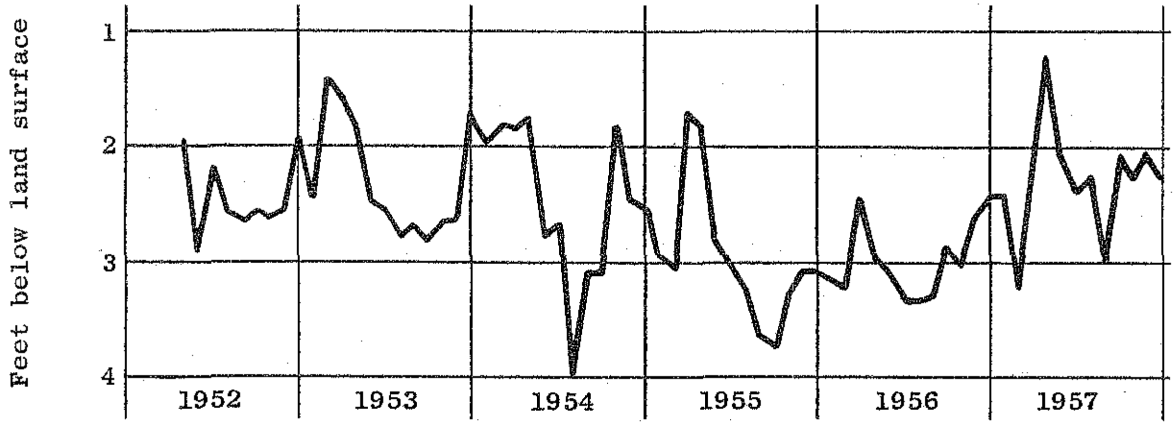

Figure 64.--Hydrograph of well Lf-3/5/8-63.

Lafayette Co. Wisconsin Conservation Department. SE¼NE¼ sec. 8, T. 3 N., R. 5 E. Bored observation water-table well in alluvium of Recent age, diam 2 in, depth 17 ft, cased to 15, well point 15-17. MP, top of casing, 3.0 ft above lsd. Measured monthly. All plotted. Measured weekly before December 1956.

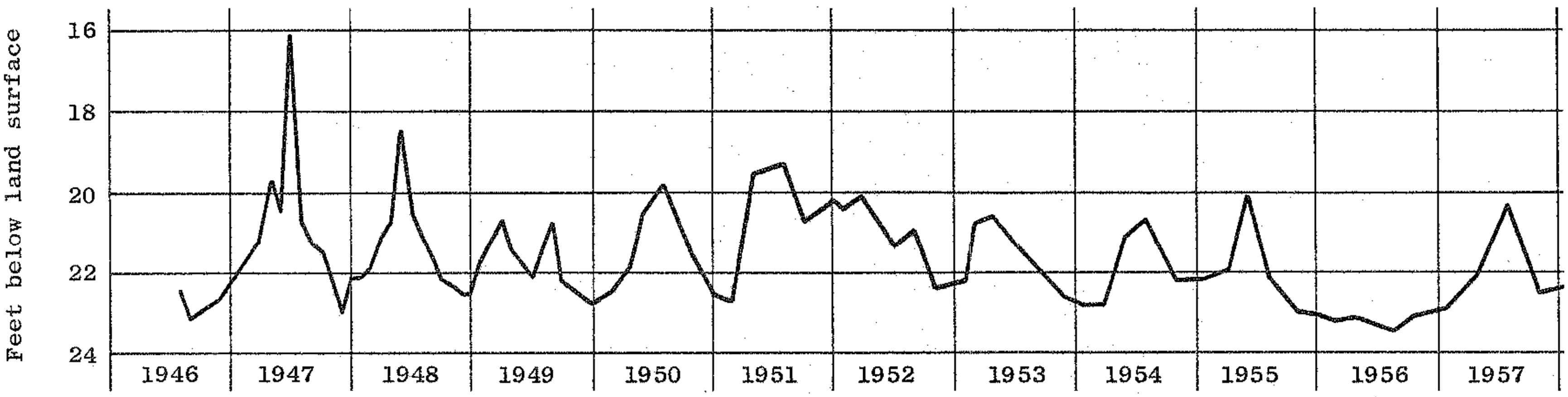

Figure 65.--Hydrograph of well Lf-3/5/25-1.

Lafayette Co. Ernest J. Legler. NW¼SW¼ sec. 25, T. 3 N., R. 5 E. Drilled unused water-table well in Prairie du Chien group, diam 6 in, depth 55 ft. Lsd, 820 ft above msl. MP, bent edge of casing, 0.50 ft above lsd. Measured bi-monthly. All plotted.

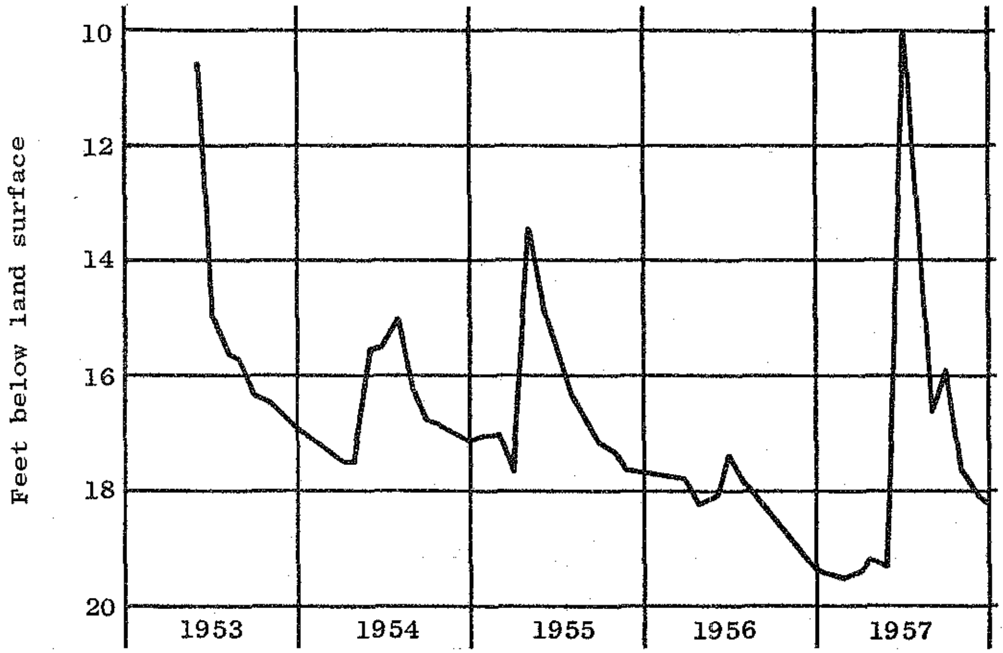

Figure 66.--Hydrograph of well Lf-4/4/35-78.

Lafayette Co. Wisconsin Conservation Dept. SW$\frac{1}{4}$SE$\frac{1}{4}$ sec. 35, T. 4 N., R. 4 E. Drilled unused artesian well in St. Peter sandstone, diam 6 in, depth 29 ft, cased to 4. MP, top of casing, at lsd. Measured monthly. All plotted. Recording gage before January 1957.

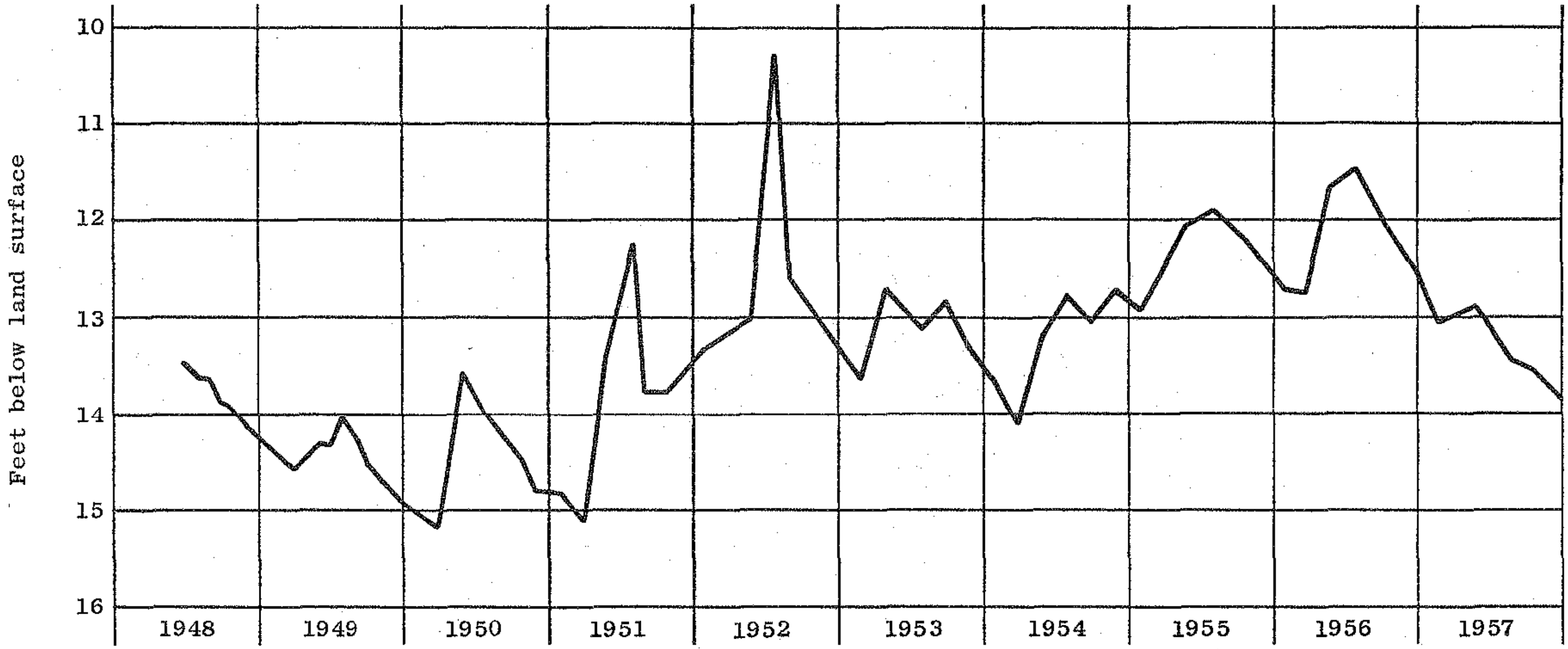

Figure 67.--Hydrograph of well La-31/10/35-9.

Langlade Co. U. S. Geol. Survey. SW$\frac{1}{4}$NE$\frac{1}{4}$ sec. 35, T. 31 N., R. 10 E. Driven observation water-table well in sand of Pleistocene age, diam 1$\frac{1}{4}$ in, depth 19 ft, cased to 17, well point 17-19. Lsd, 1,469 ft above msl. MP, top of casing, 1.07 ft above lsd. Measured bi-monthly. All plotted.

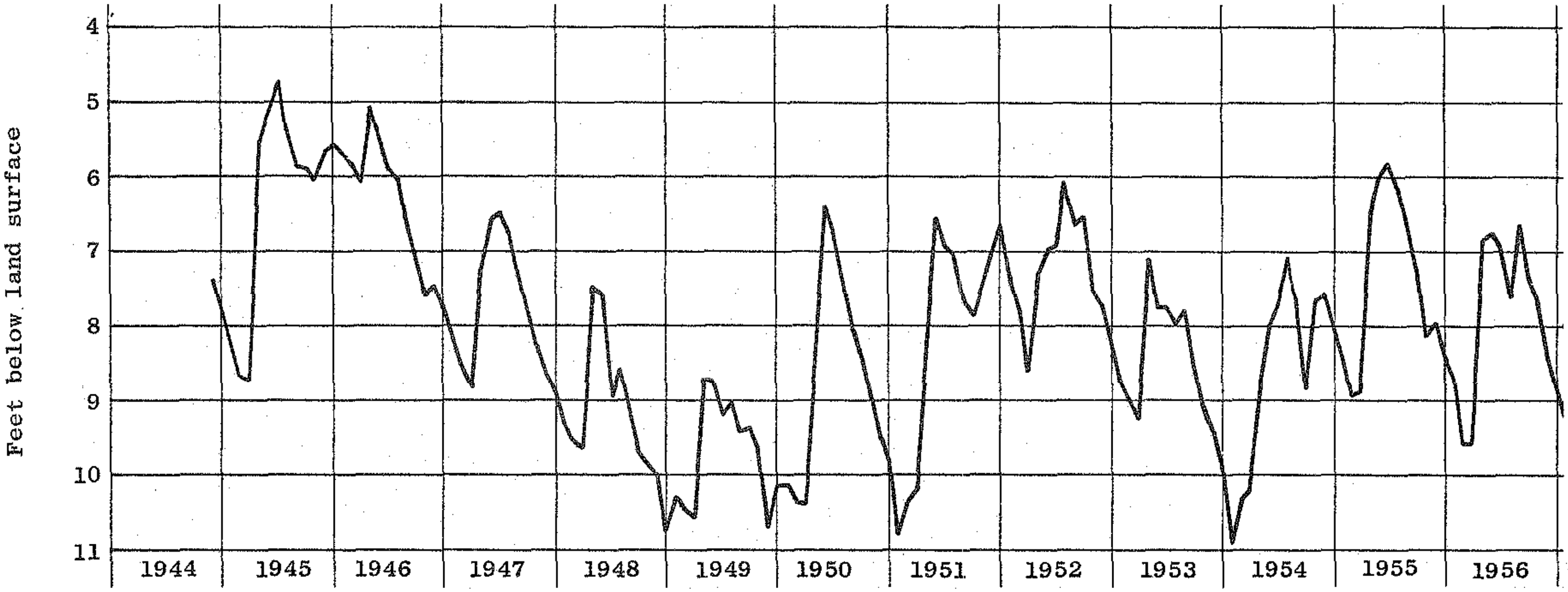

Figure 68.--Hydrograph of well La-31/11/7-26.

Langlade Co. U. S. Geol. Survey. SE¼NE¼ sec. 7, T. 31 N., R. 11 E. Driven observation water-table well in sand of Pleistocene age, diam 1¼ in, depth 23 ft, cased to 21, well point 21-23. Lsd, 1,521.66 ft above msl. MP, top of collar on casing, 1.0 ft above lsd. Measured weekly. Lowest monthly plotted.

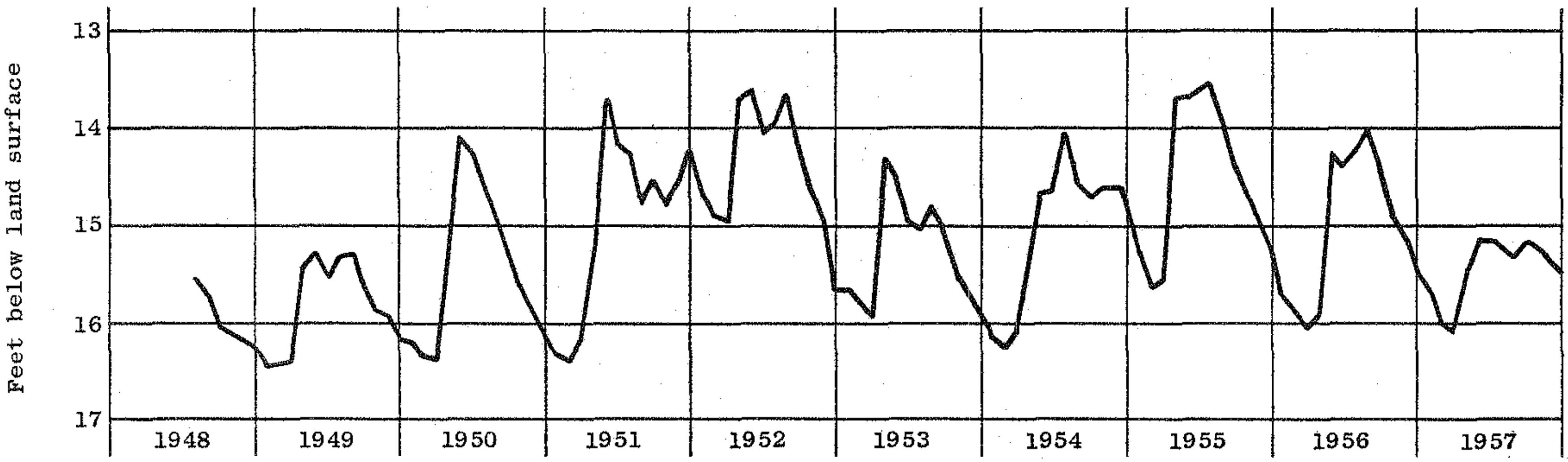

Figure 69.--Hydrograph of well La-31/11/20-64.

Langlade Co. Wisconsin Conservation Department. NW¼SE¼ sec. 20, T. 31 N., R. 11 E. Driven observation water-table well in sand of Pleistocene age, diam 2 in, reported depth 20 ft, cased to 18, well point 18-20. Lsd, 1,507.63 ft above msl. MP, top of collar on casing, 0.3 ft above lsd. Measured weekly. Lowest monthly plotted.

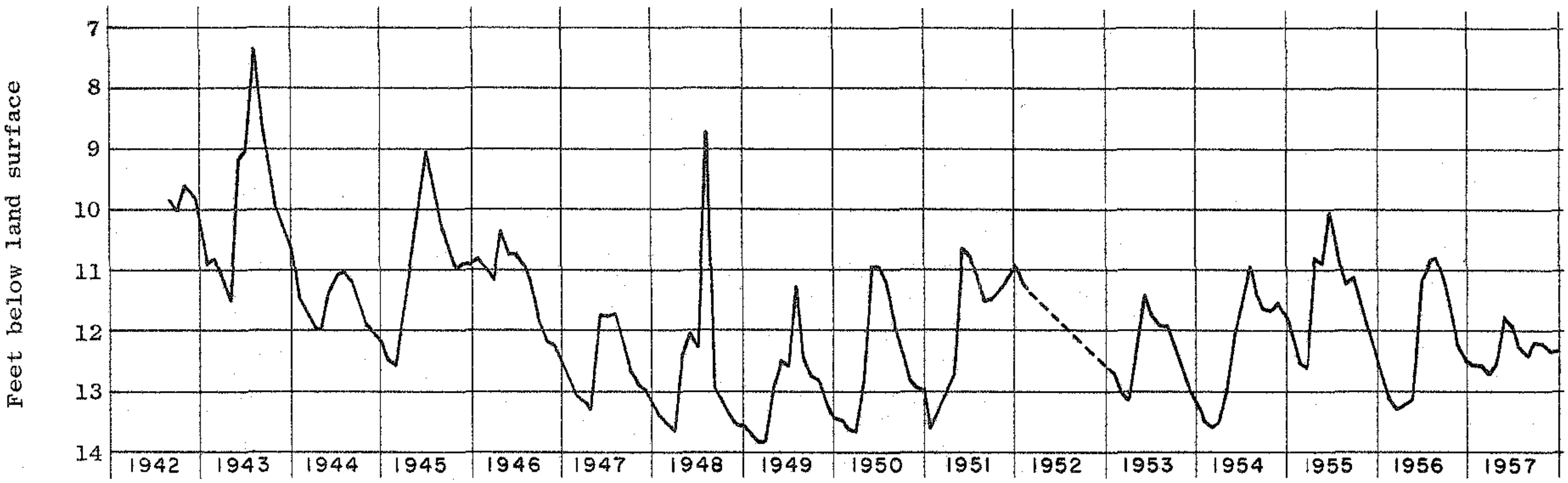

Figure 70.--Hydrograph of well La-31/11/20-118.

Langlade Co. Wisconsin Public Service Corp. NE$\frac{1}{4}$NW$\frac{1}{4}$ sec. 20, T. 31 N., R. 11 E. Driven observation water-table well in sand of Pleistocene age, diam 1$\frac{1}{2}$ in, depth 21 ft, well point 19-21. Lsd, 1,510.45 ft above msl. MP, top of casing, 0.50 ft above lsd. Measured weekly. Lowest monthly plotted.

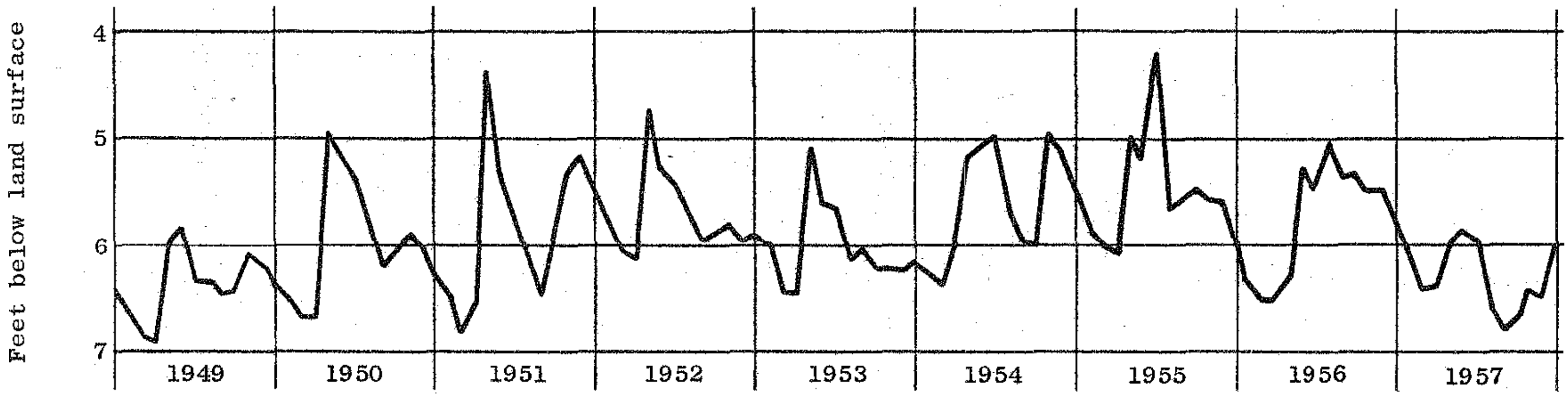

Figure 71.--Hydrograph of well La-31/11/29-200.

Langlade Co. Antigo Water Department. NE¼NW¼ sec. 29, T. 31 N., R. 11 E. Jetted unused water-table well in sand of Pleistocene age, diam 6 in, reported depth 15 ft, cased to 14. Lsd, 1,491 ft above msl. MP, 2.0 ft above lsd. Recording gage. Lowest monthly plotted.

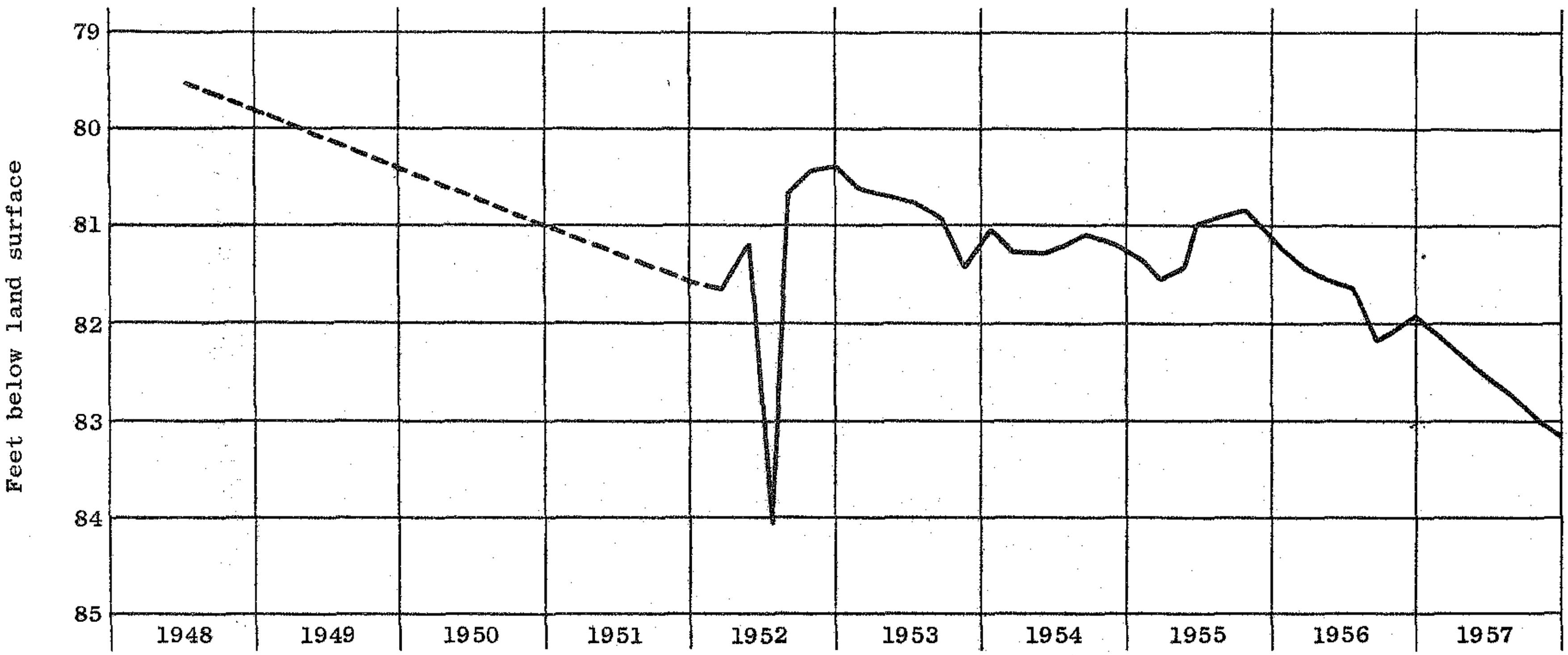

Figure 72.--Hydrograph of well La-31/12/8-27.

Langlade Co. Julius and Sabina Boelter. NW¼NW¼ sec. 8, T. 31 N., R. 12 E. Drilled stock water-table well in sand of Pleistocene age, diam 4 in, depth 93 ft. Lsd, 1,594 ft above msl. MP, hole in casing, at lsd. Measured bi-monthly. All plotted.

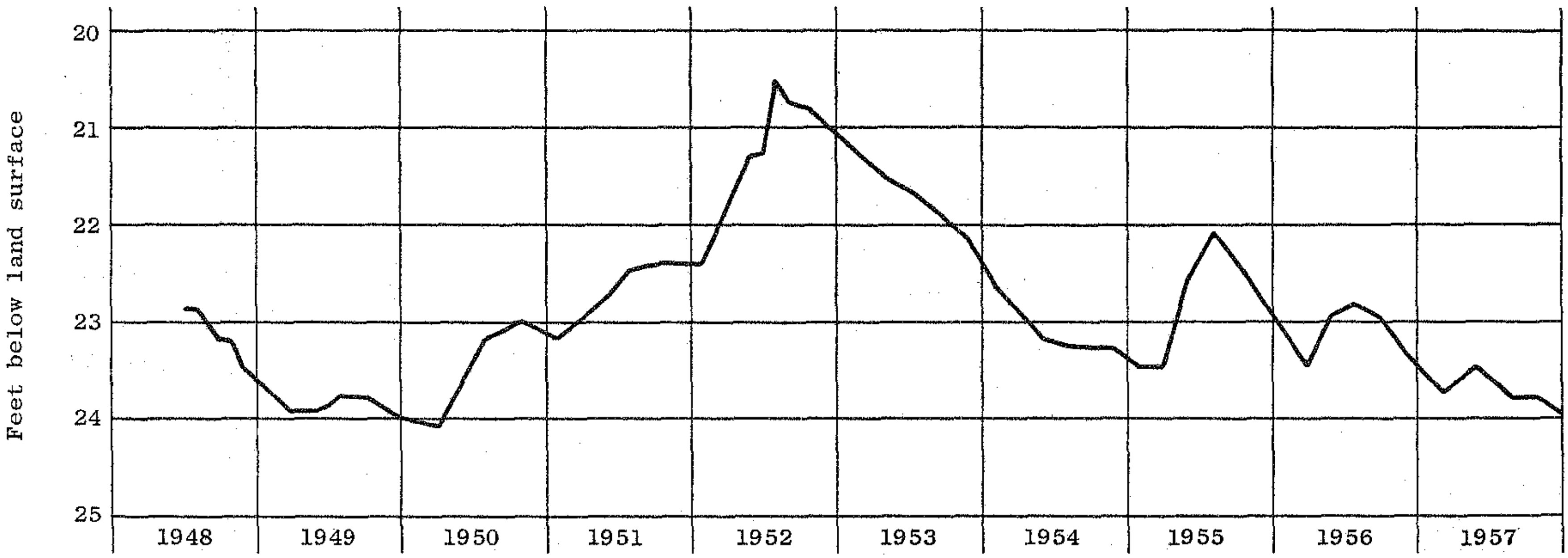

Figure 73.--Hydrograph of well La-32/11/32-44.

Langlade Co. J. Jacobus. NE¼NW¼ sec. 32, T. 32 N., R. 11 E. Driven unused water-table well in sand of Pleistocene age, diam 1¼ in, depth 26 ft, cased to 24, well point 24-26. Lsd, 1,547.84 ft above msl. MP, top of casing, 0.8 ft above lsd. Measured bi-monthly. All plotted.

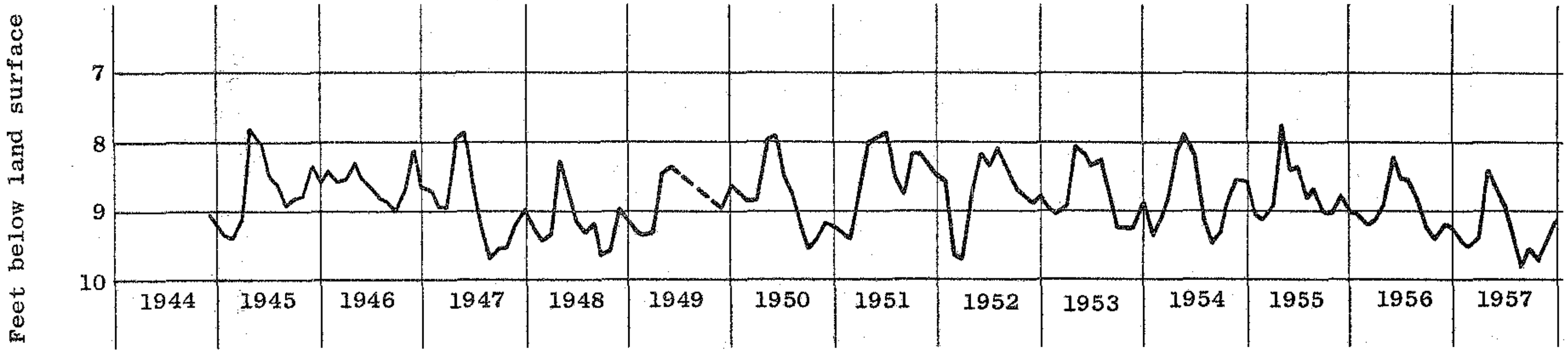

Figure 74.--Hydrograph of well Ln-34/6/36-25a.

Lincoln Co. U. S. Geol. Survey. SE$\frac{1}{4}$NE$\frac{1}{4}$ sec. 36, T. 34 N., R. 6 E. Driven observation water-table well in deposits of Pleistocene age, diam $1\frac{1}{4}$ in, depth 22 ft, well point 20-22. MP, top of pipe, 3.00 ft above lsd. Measured weekly. Lowest monthly plotted.

Figure 75.--Hydrograph of well Mr-26/3/33-7.

Marathon Co. City of Marshfield. SE¼SE¼ sec. 33, T. 26 N., R. 3 E. Drilled unused water-table well in sand and gravel of Pleistocene age, diam 7 in, reported depth 49 ft, cased to 30, screened 30-49. MP, top of casing, 1.00 ft above lsd. Recording gage. Lowest monthly plotted.

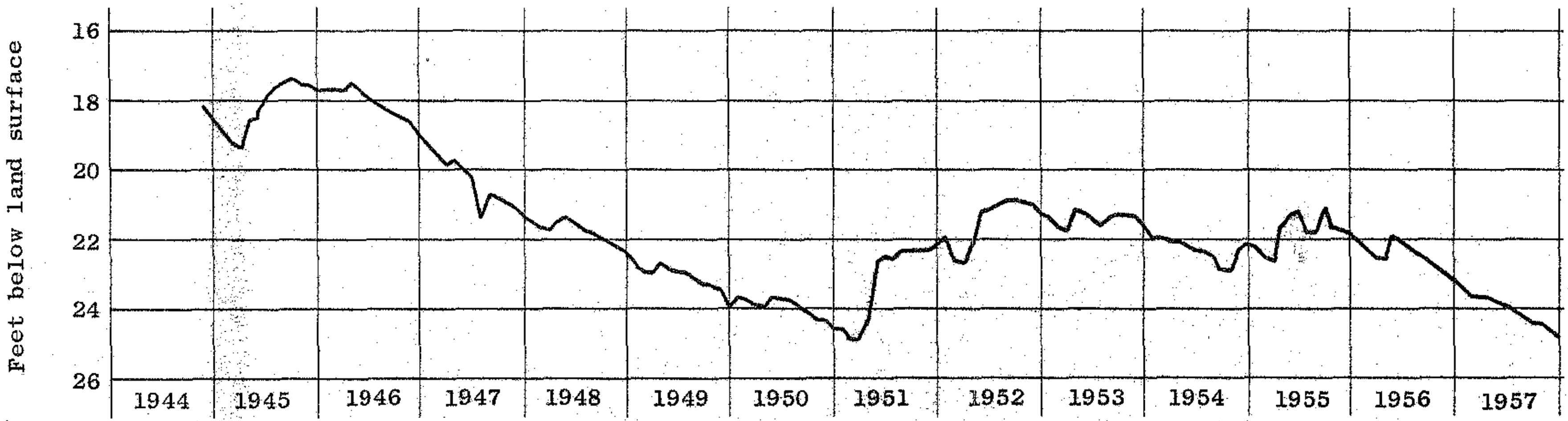

Figure 76.--Hydrograph of well Mr-27/9/31-28.

Marathon Co. U. S. Geol. Survey. NE¼NE¼ sec. 31, T. 27 N., R. 9 E. Driven observation water-table well in sand and gravel of Pleistocene age, diam 1¼ in, depth 27 ft, well point 25-27. Lsd, 1,229 ft above msl. MP, top of pipe, 0.80 ft above lsd. Measured weekly. Lowest monthly plotted.

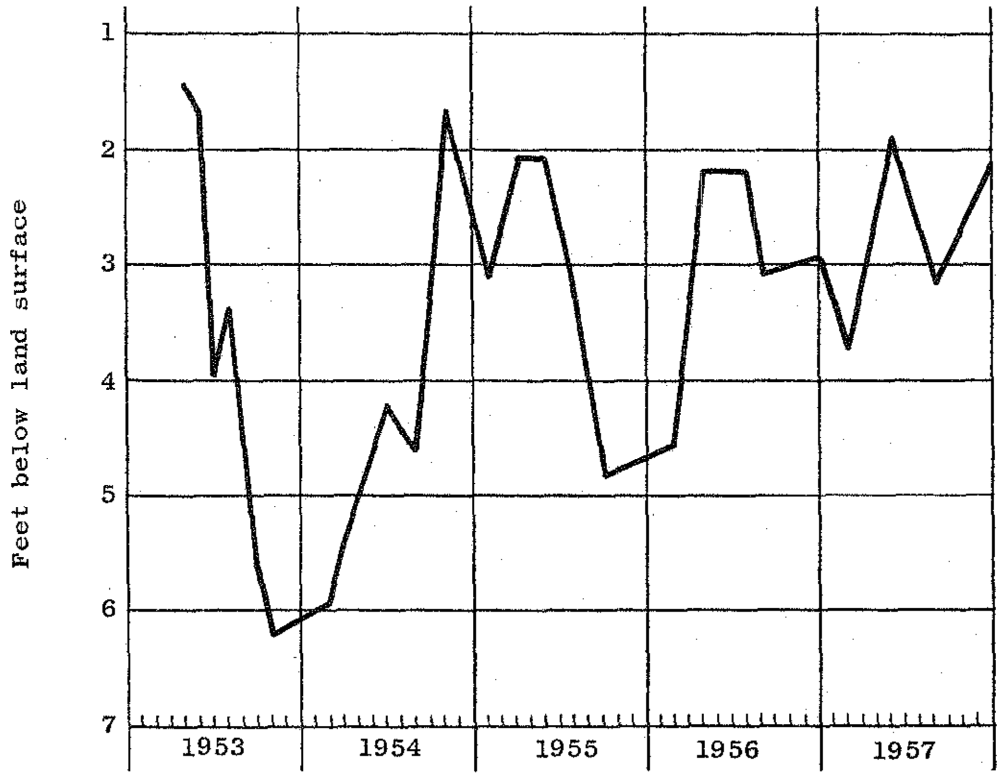

Figure 77.--Hydrograph of well Mr-28/2/18-8.

Marathon Co. William Pacholke, Sr. SW$\frac{1}{4}$SW$\frac{1}{4}$ sec. 18, T. 28 N., R. 2 E. Drilled unused water-table well in sand of Pleistocene age, diam 7 in, depth 48 ft. MP, top of casing, 2.0 ft above lsd. Measured bi-monthly. All plotted.

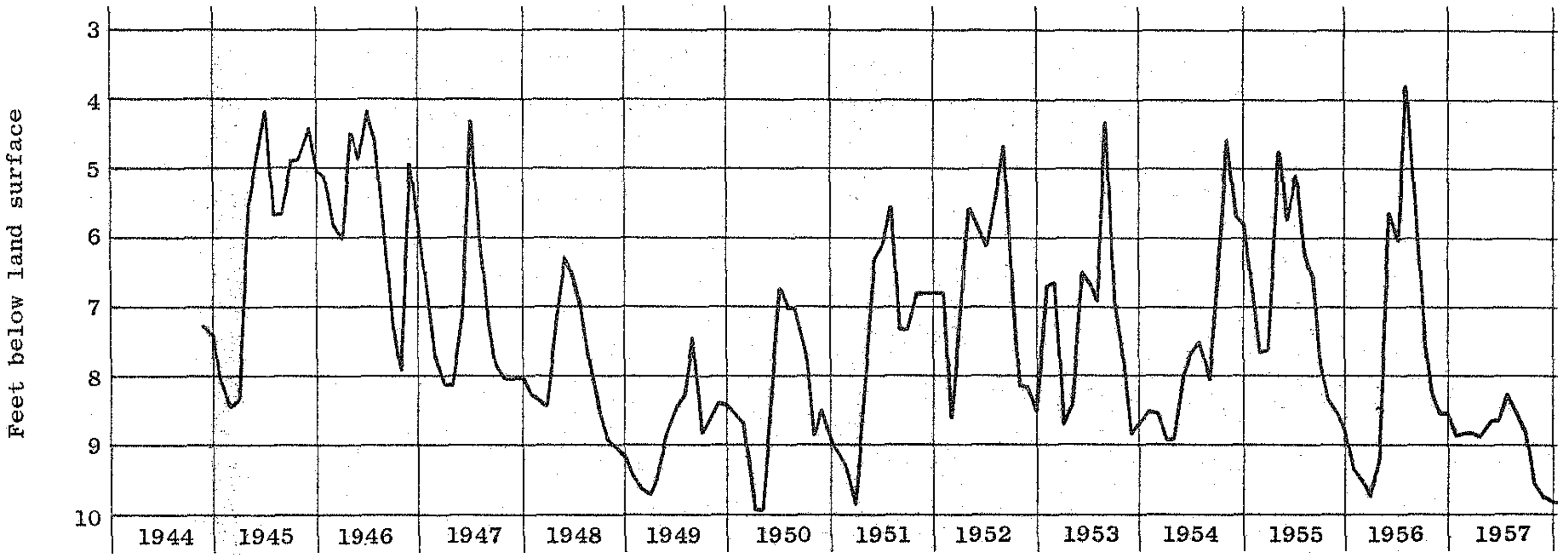

Figure 78.--Hydrograph of well Mr-29/3/24-27.

Marathon Co. Conrad Kremsreiter. SE¼SE¼ sec. 24, T. 29 N., R. 3 E. Drilled unused water-table well in sand and gravel of Pleistocene age, diam 8 to 4 in, depth 42 ft. MP, top of casing, 1.0 ft above lsd. Measured weekly. Lowest monthly plotted.

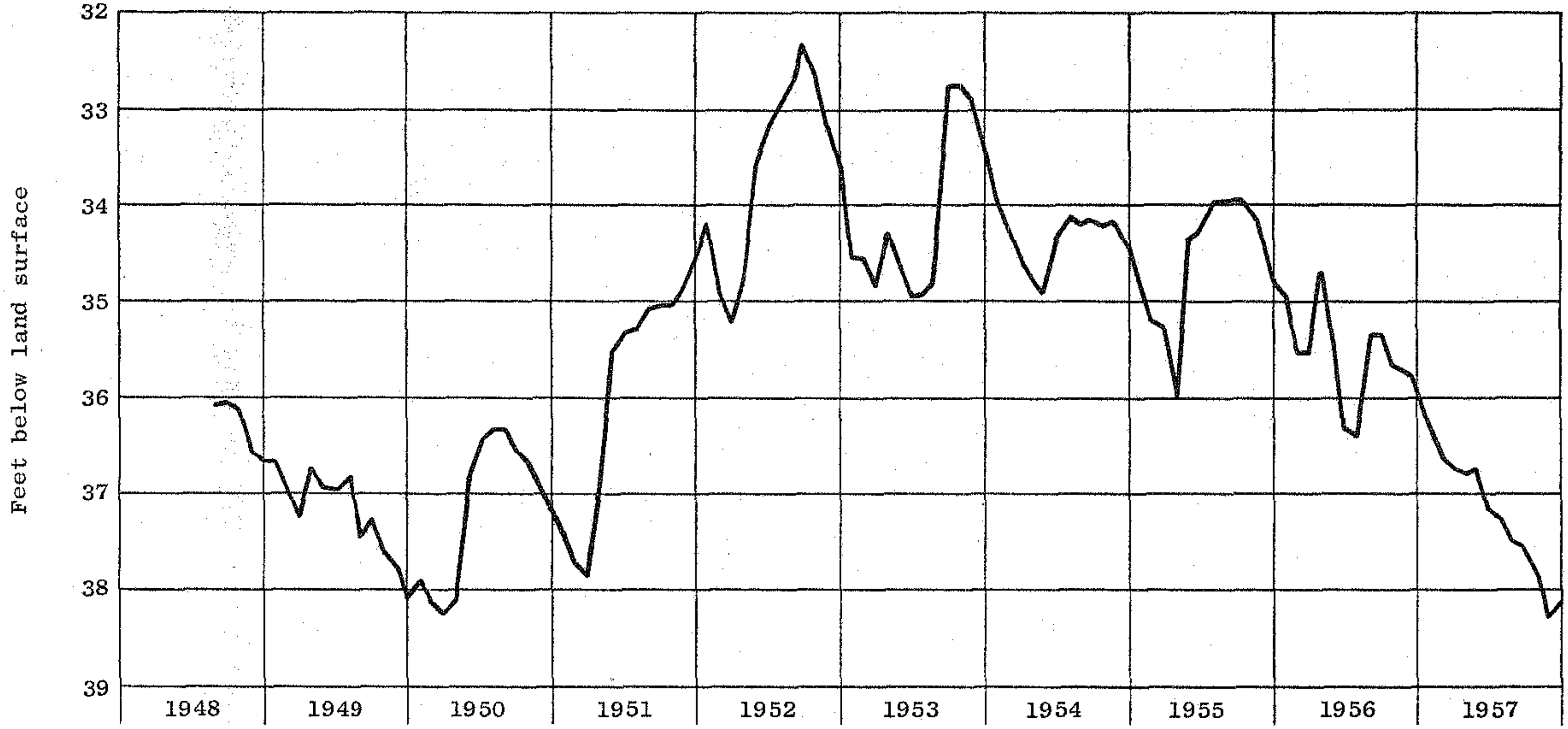

Figure 79.--Hydrograph of well Mr-30/10/25-1.

Marathon Co. George Chrudimsky. NW¼NE¼ sec. 25, T. 30 N., R. 10 E. Drilled domestic and stock water-table well in sand and gravel of Pleistocene age, diam 4 in, reported depth 85 ft. MP, hole in pump base, 0.63 ft above lsd. Measured weekly. Lowest monthly plotted.

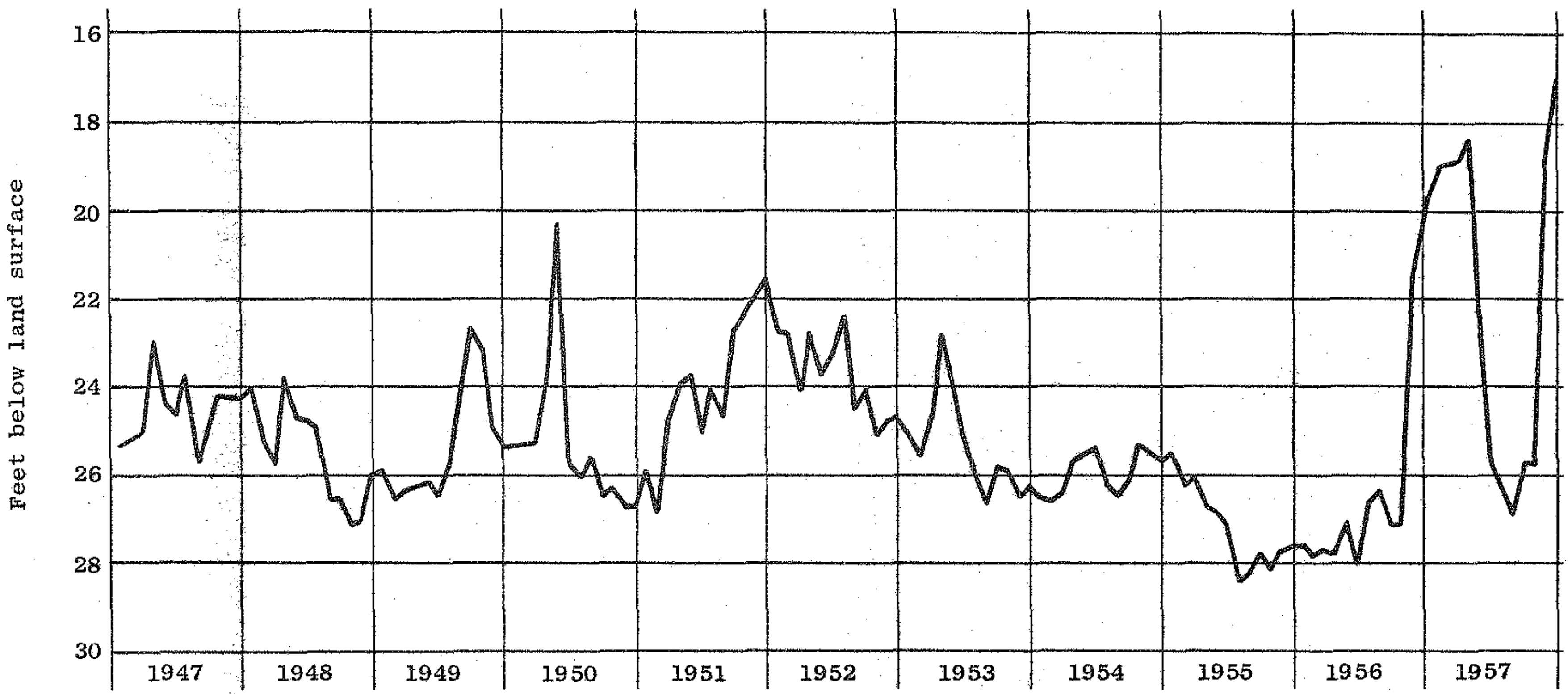

Figure 80.--Hydrograph of well Mt-30/23/19-5.

Marinette Co. City of Peshtigo. SE$\frac{1}{4}$NE$\frac{1}{4}$ sec. 19, T. 30 N., R. 23 E. Drilled unused artesian well in sandstone of Cambrian age and St. Peter sandstone, diam 5 in, depth 703 ft, cased to 31. MP, top of casing, 0.50 ft above lsd. Recording gage. Lowest monthly plotted. Measured weekly January 1951 - June 1953. Recording gage August 1948 - January 1951. Measured monthly before August 1948.

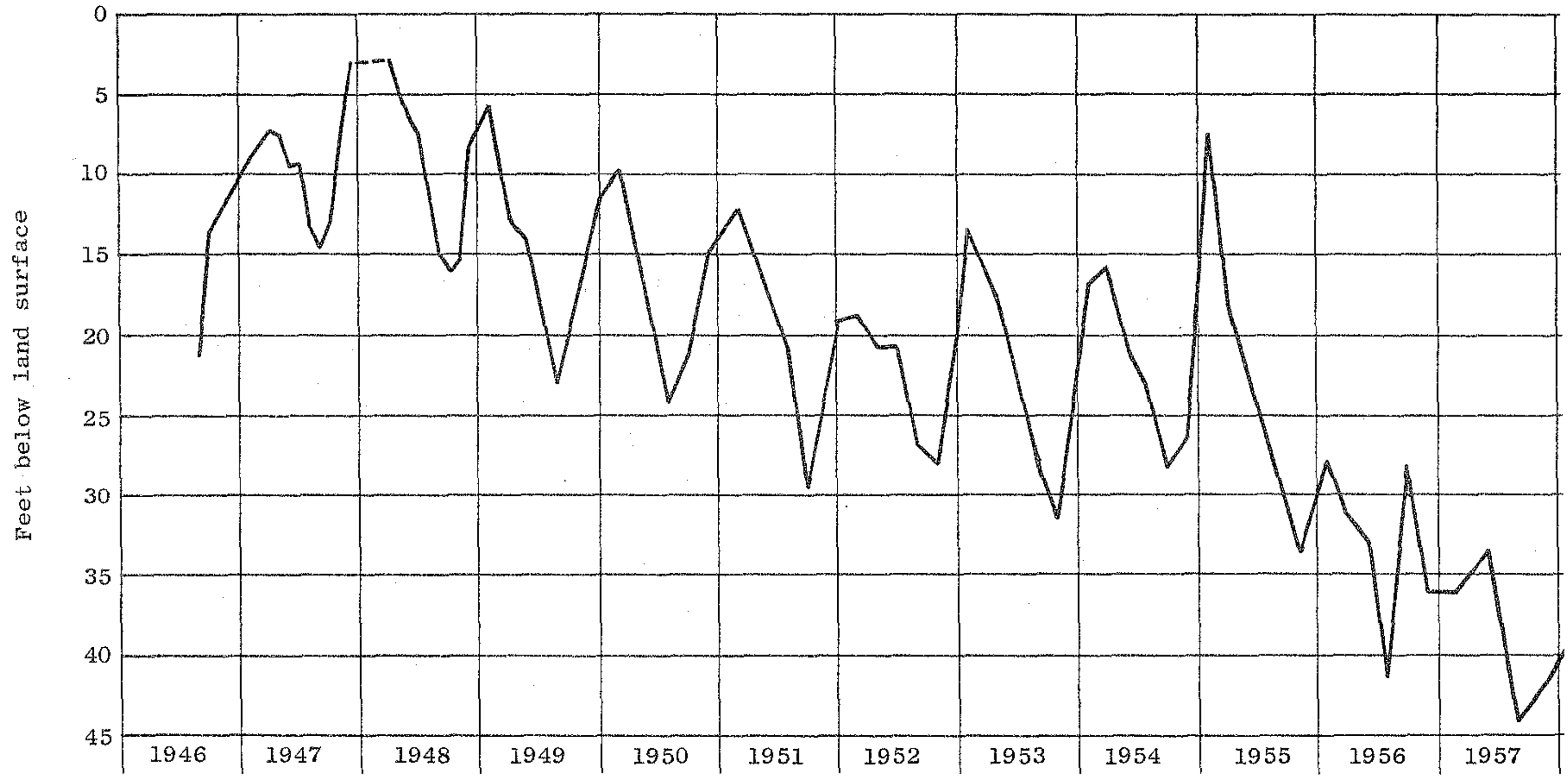

Figure 81.--Hydrograph of well Mt-30/24/6-1.

Marinette Co. R. S. Skidmore. SE$\frac{1}{4}$NW$\frac{1}{4}$ sec. 6, T. 30 N., R. 24 E. Drilled unused artesian well in sandstone of Cambrian age, diam 5 in, reported depth 700 ft. MP, hole in pump base, 3.0 ft below lsd. Measured bi-monthly. All plotted.

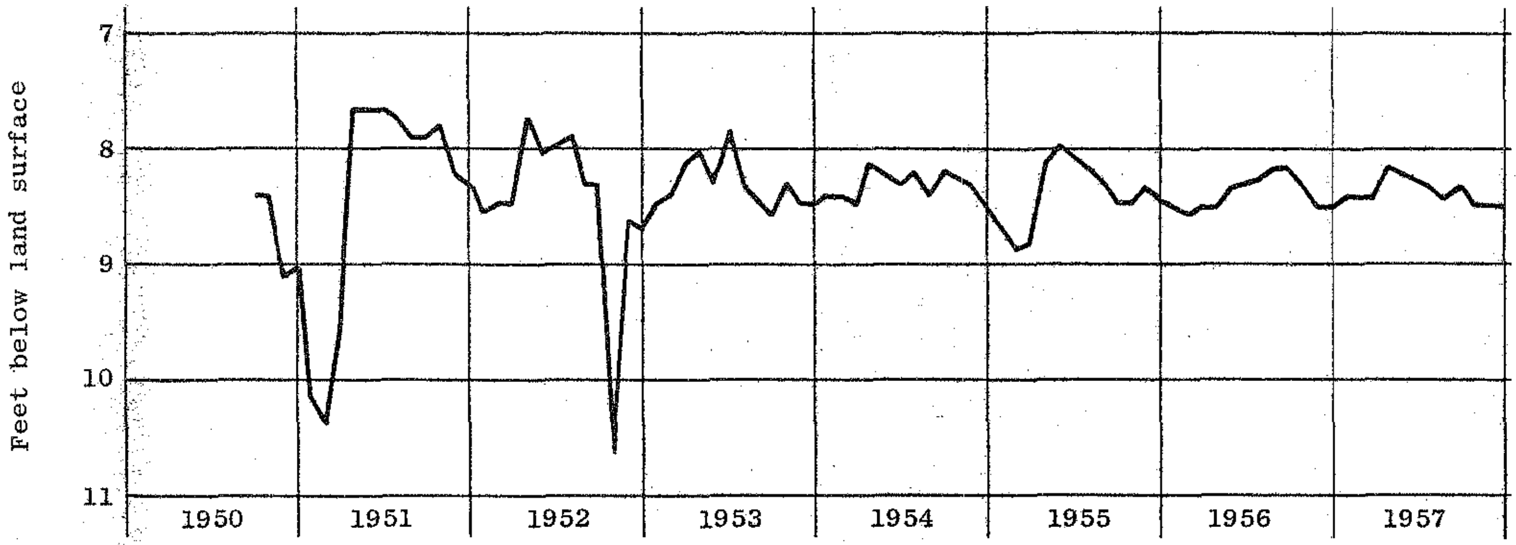

Figure 82.--Hydrograph of well Mt-35/22/18-9.

Marinette Co. Fox River Valley Girl Scouts. W. M. P. No. 32. SW$\frac{1}{4}$NE$\frac{1}{4}$ sec. 18, T. 35 N., R. 22 E. Drilled domestic water-table well in till of Pleistocene age, diam 6 in, depth 75 ft. MP, 3.0 ft above lsd. Measured monthly. All plotted.

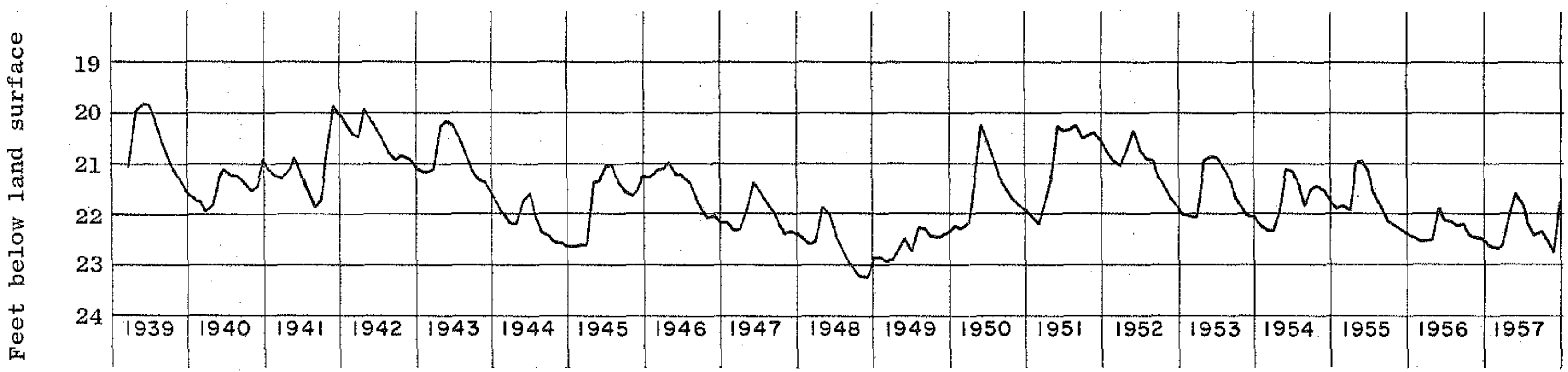

Figure 83.--Hydrograph of well Mt-37/20/34-7.

Marinette Co. Wisconsin Conservation Dept. NW¼NE¼ sec. 34, T. 37 N., R. 20 E. Drilled unused water-table well in deposits of Pleistocene age, diam 8 in, reported depth 33 ft. MP, pointer on float gage, 4.00 ft above lsd. Measured weekly. Lowest monthly plotted.

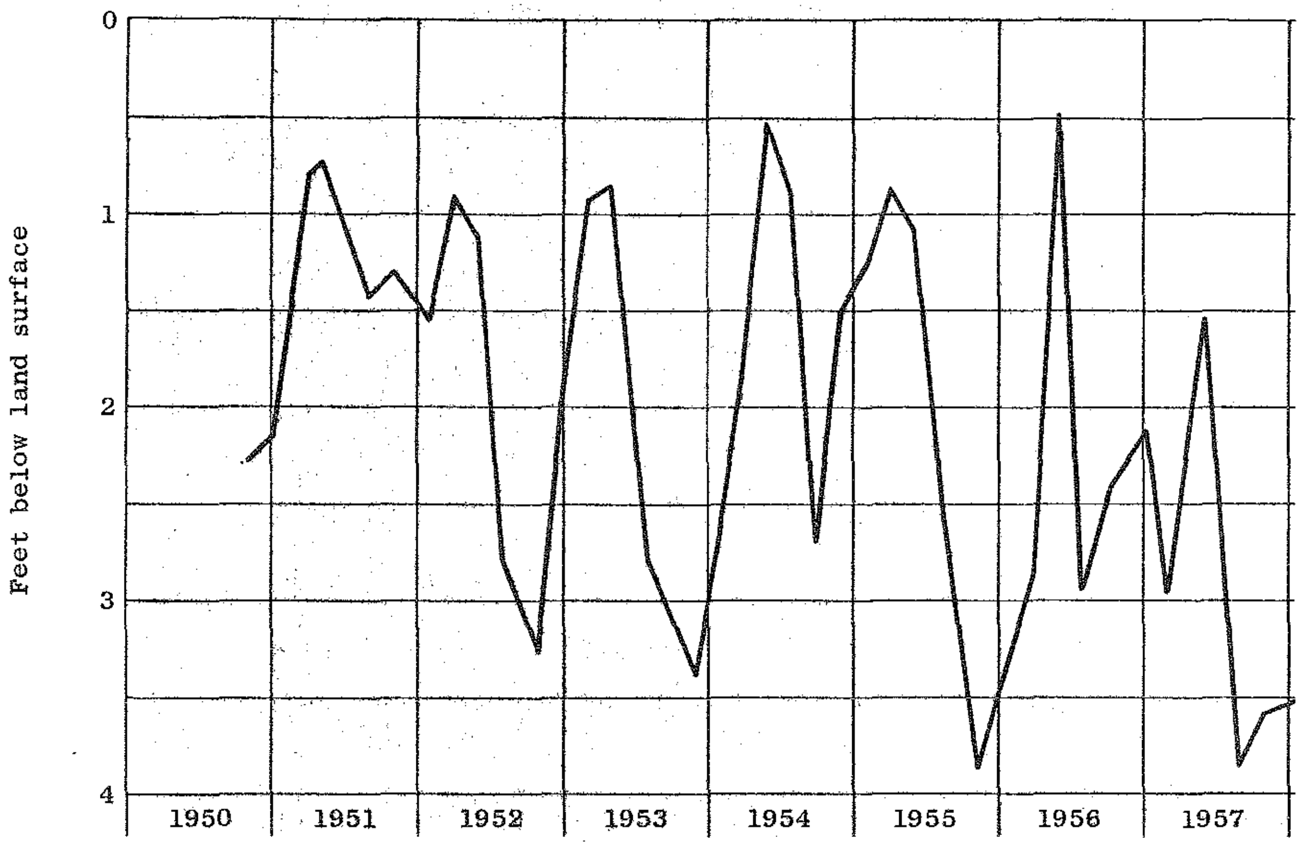

Figure 84A.--Hydrograph of well Mq-15/9/17-11.

Marquette Co. U. S. Geol. Survey. NW$\frac{1}{4}$SW$\frac{1}{4}$ sec. 17, T. 15 N., R. 9 E. Driven observation water-table well in sand of Pleistocene age, diam 1$\frac{1}{2}$ in, depth 12 ft, well point 10-12. MP, top of casing, 2.00 ft above lsd. Measured bi-monthly. All plotted.

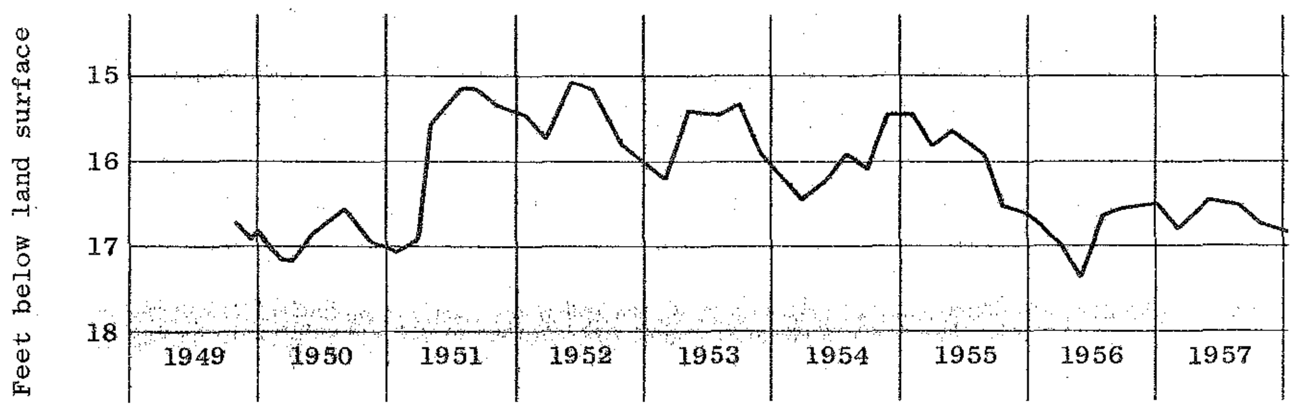

Figure 84B.--Hydrograph of well Mq-16/8/12-9.

Marquette Co. Village of Westfield. SW$\frac{1}{4}$SE$\frac{1}{4}$ sec. 12, T. 16 N., R. 8 E. Drilled unused artesian well in sandstone of Cambrian age, diam 6 in, depth 274 ft. MP, top of casing, 1.00 ft above lsd. Measured bi-monthly. All plotted.

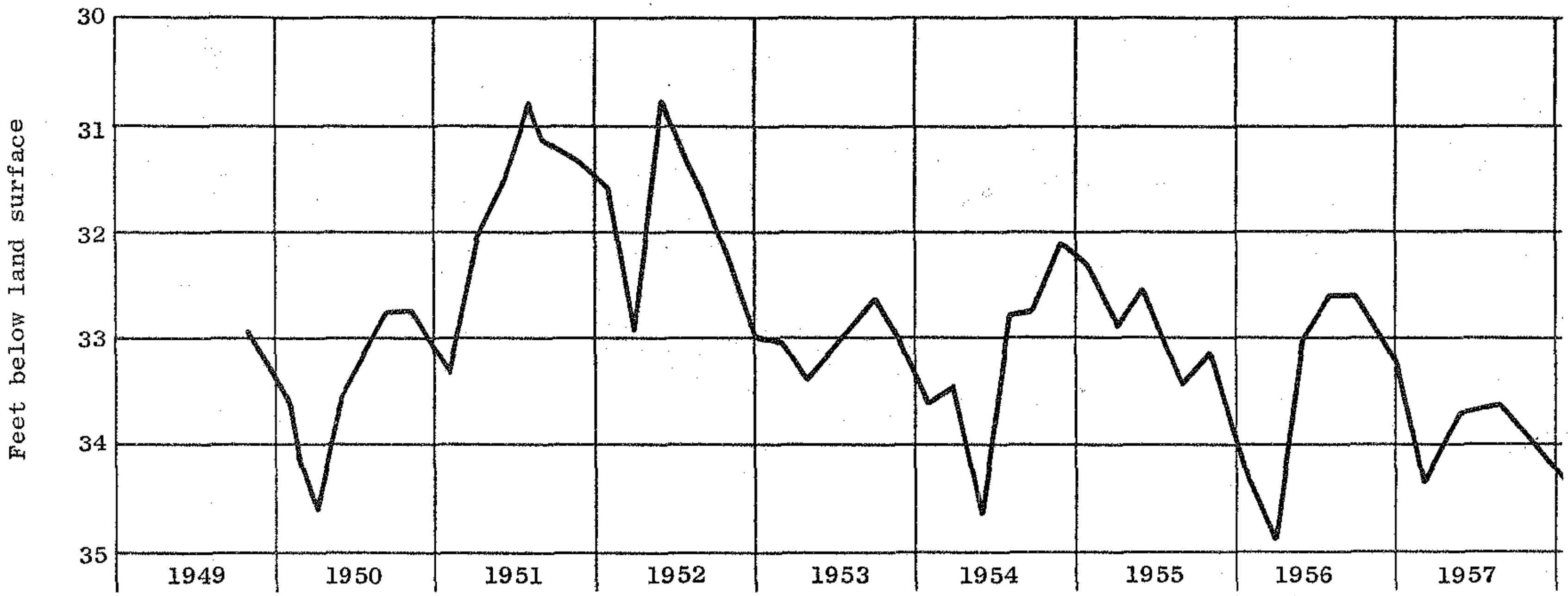

Figure 85.--Hydrograph of well Mq-16/10/33-7.

Marquette Co. George Croarken. NW$\frac{1}{4}$SE$\frac{1}{4}$ sec. 33, T. 16 N., R. 10 E. Drilled unused water-table well in deposits of Pleistocene age, diam 6 in. MP, hole in pump, 0.6 ft above lsd. Measured bimonthly. All plotted.

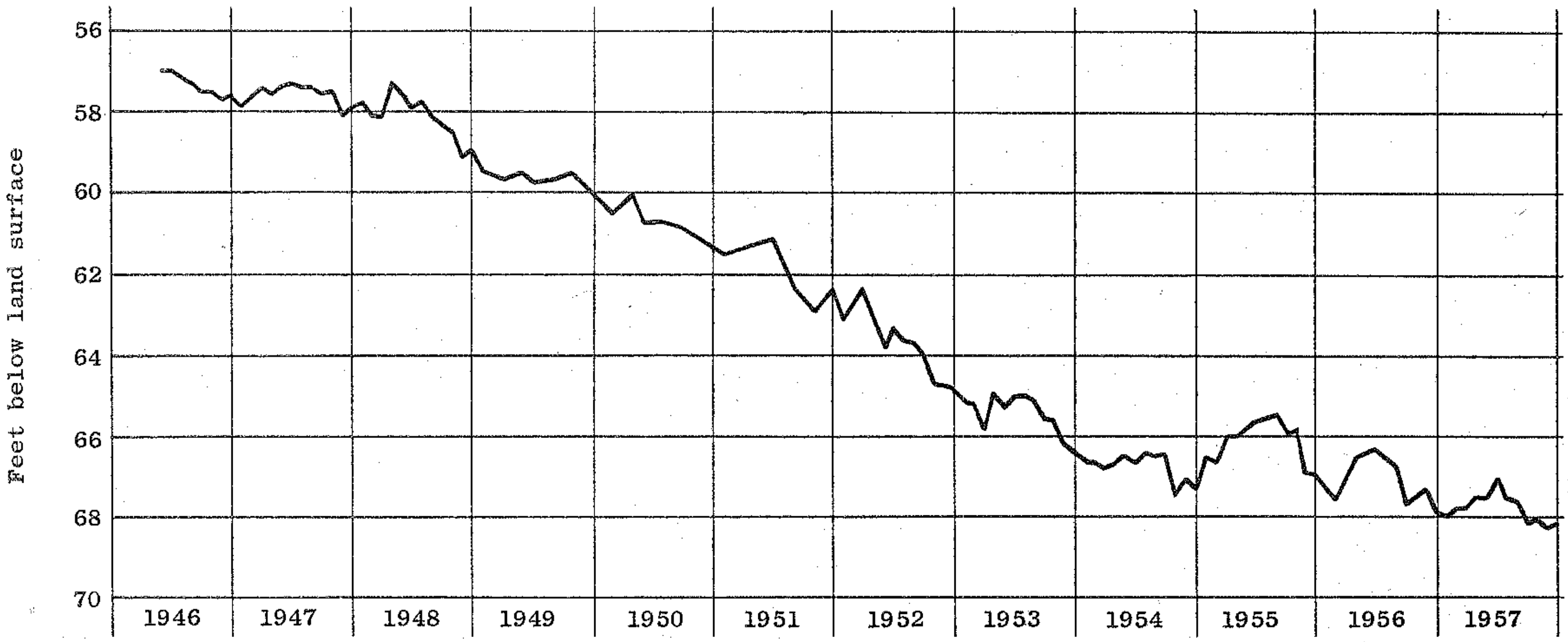

Figure 86.--Hydrograph of well Ml-5/22/13-121.

Milwaukee Co. Propulsion Engine Corp. 311 Marion St., Milwaukee. NW¼NW¼ sec. 13, T. 5 N., R. 22 E. Drilled unused artesian well in Niagara dolomite, diam 8 in, depth 268 ft, cased to 98. Lsd, 644 ft above msl. MP, top of casing, at lsd. Recording gage. Lowest monthly plotted.

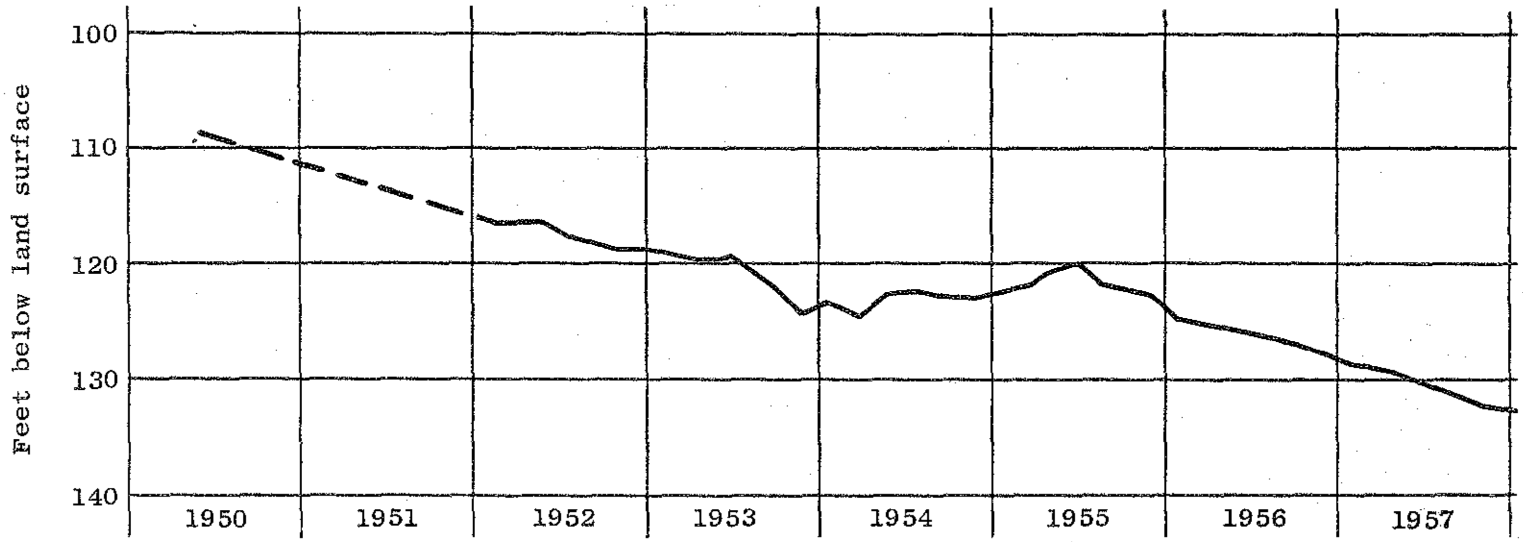

Figure 87.--Hydrograph of well Ml-5/22/24-95.

Milwaukee Co. Allis Chalmers Mfg. Co. SE¼SW¼ sec. 24, T. 5 N., R. 22 E. Drilled unused artesian well in sandstone of Cambrian age and St. Peter sandstone, diam 8 in, reported depth 1,622 ft. Lsd, 656 ft above msl. MP, breather hole, 1.00 ft above lsd. Measured bi-monthly. All plotted.

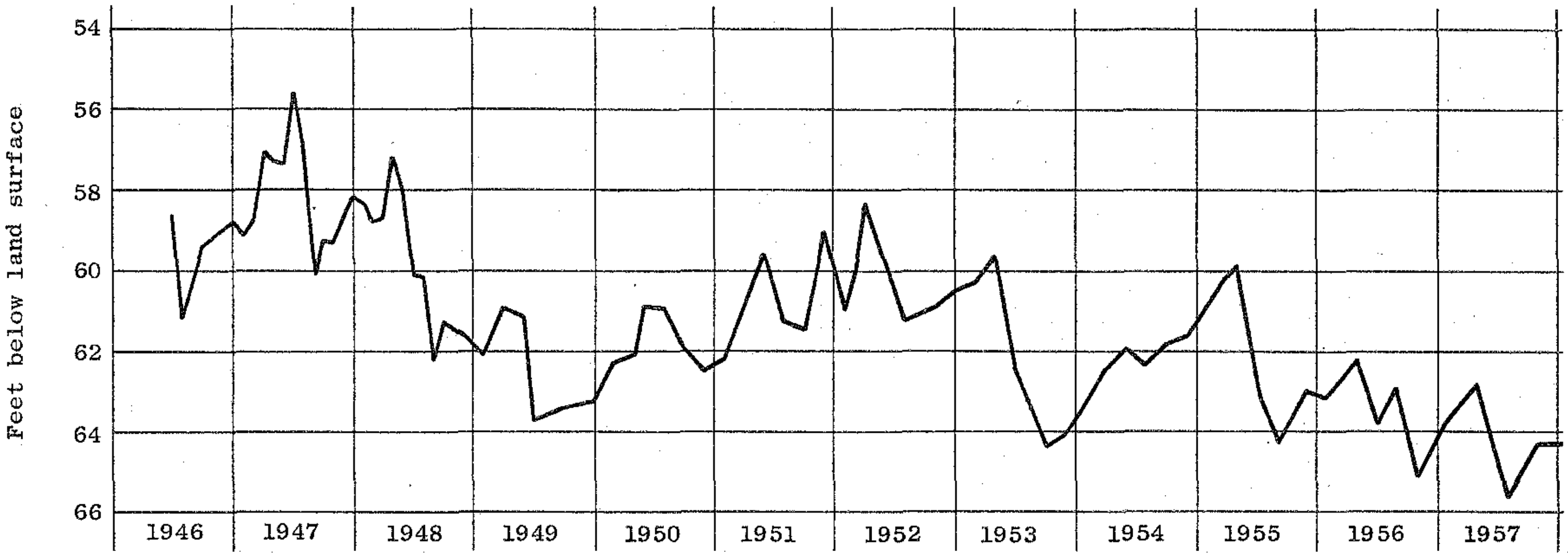

Figure 88.--Hydrograph of well Ml-6/21/6-130.

Milwaukee Co. Milwaukee County. Greenfield Park. NW$\frac{1}{4}$NW$\frac{1}{4}$ sec. 6, T. 6 N., R. 21 E. Drilled public-supply artesian well in Niagara dolomite, diam 10 in, reported depth 500 ft. Lsd, 788 ft above msl. MP, hole in pump base, 8.0 ft below lsd. Measured bi-monthly. All plotted.

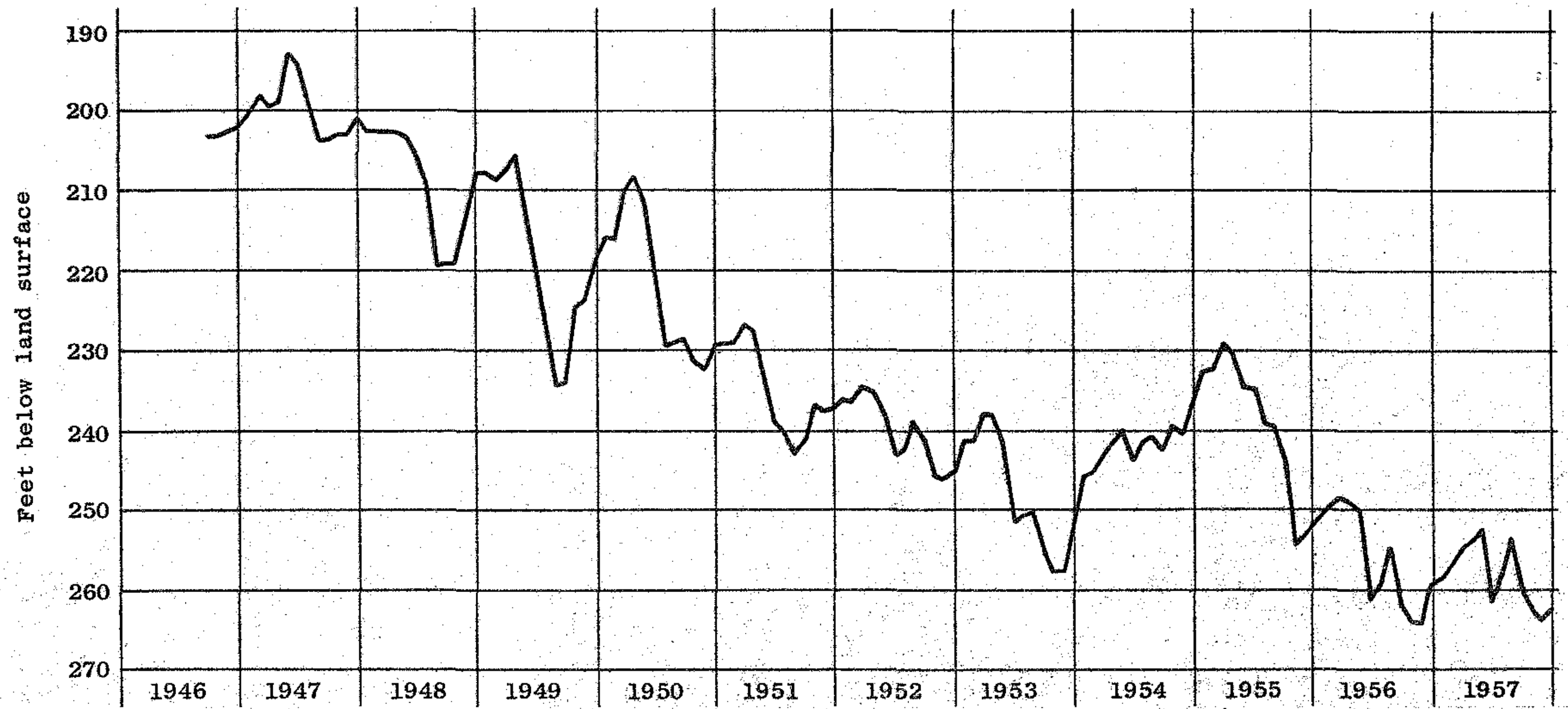

Figure 89.--Hydrograph of well Ml-6/21/11-132.

Milwaukee Co. White Manor Water Cooperative. 52nd and W. Dakota Sts., Milwaukee. SE¼SW¼ sec. 11, T. 6 N., R. 21 E. Drilled unused artesian well in St. Peter sandstone and Niagara dolomite, diam 12 in, reported depth 1,115 ft, cased to 201, 10 in liner 358-618. Lsd, 730 ft above msl. MP, bottom of notch in top of casing, 1.0 ft above lsd. Recording gage. Lowest monthly plotted.

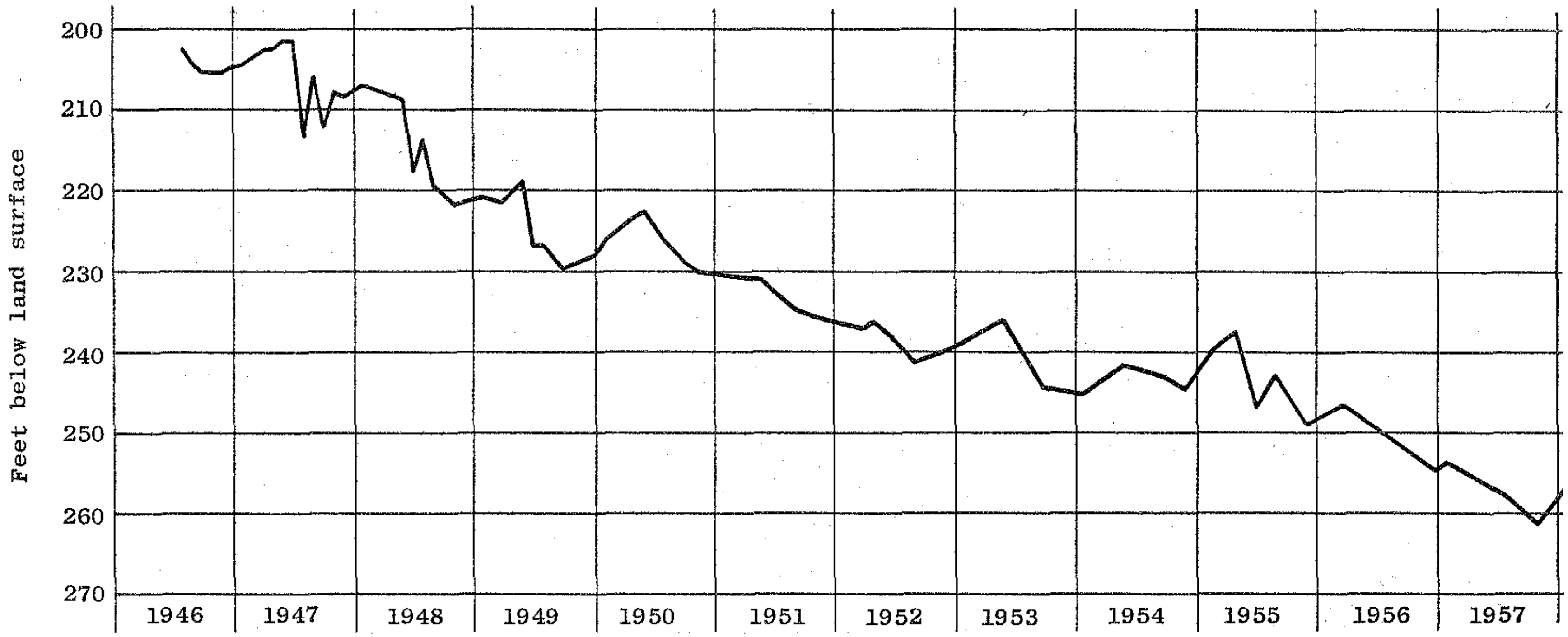

Figure 90.--Hydrograph of well Ml-6/21/32-94.

Milwaukee Co. Milwaukee County. Whitnall Park. NE$\frac{1}{4}$SE$\frac{1}{4}$ sec. 32, T. 6 N., R. 21 E. Drilled public-supply artesian well in sandstone of Cambrian age and St. Peter sandstone, diam 10 in, reported depth 1,845 ft, cased to 525. Lsd, 773 ft above msl. MP, top of pipe in side of concrete pump base, 14.21 ft below lsd. Measured bi-monthly. All plotted.

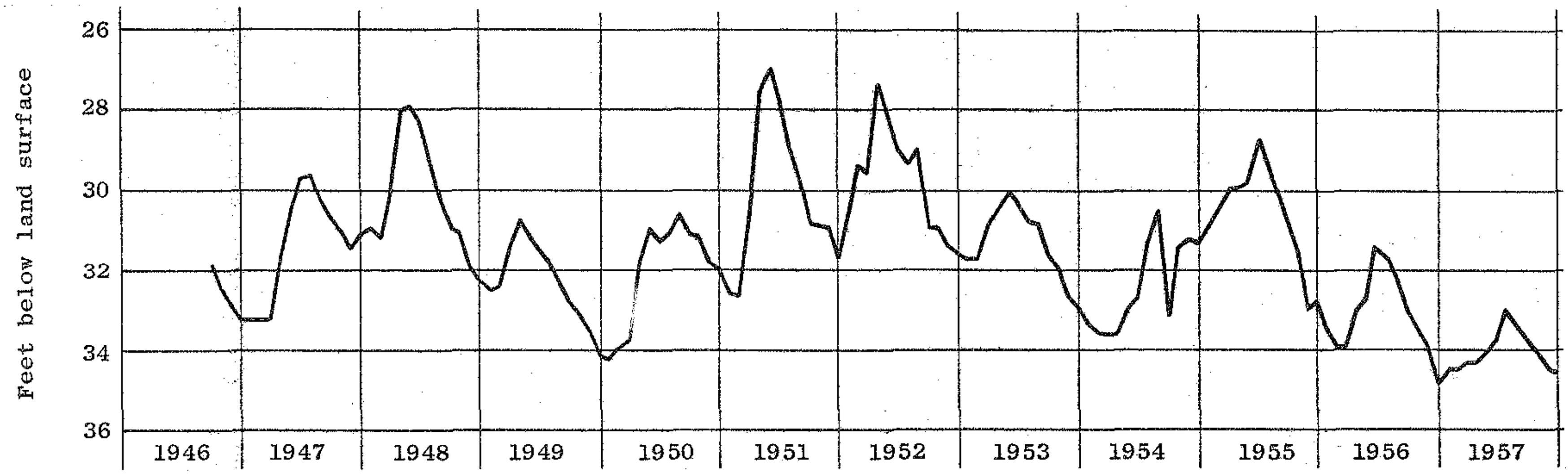

Figure 91.--Hydrograph of well Ml-6/21/32-148.

Milwaukee Co. Milwaukee County. NE¼SE¼ sec. 32, T. 6 N., R. 21 E. Drilled unused water-table well in Niagara dolomite, diam 5 in, depth 180 ft, cased to 43. Lsd, 774 ft above msl. MP, top of casing, 1.00 ft above lsd. Recording gage. Lowest monthly plotted.

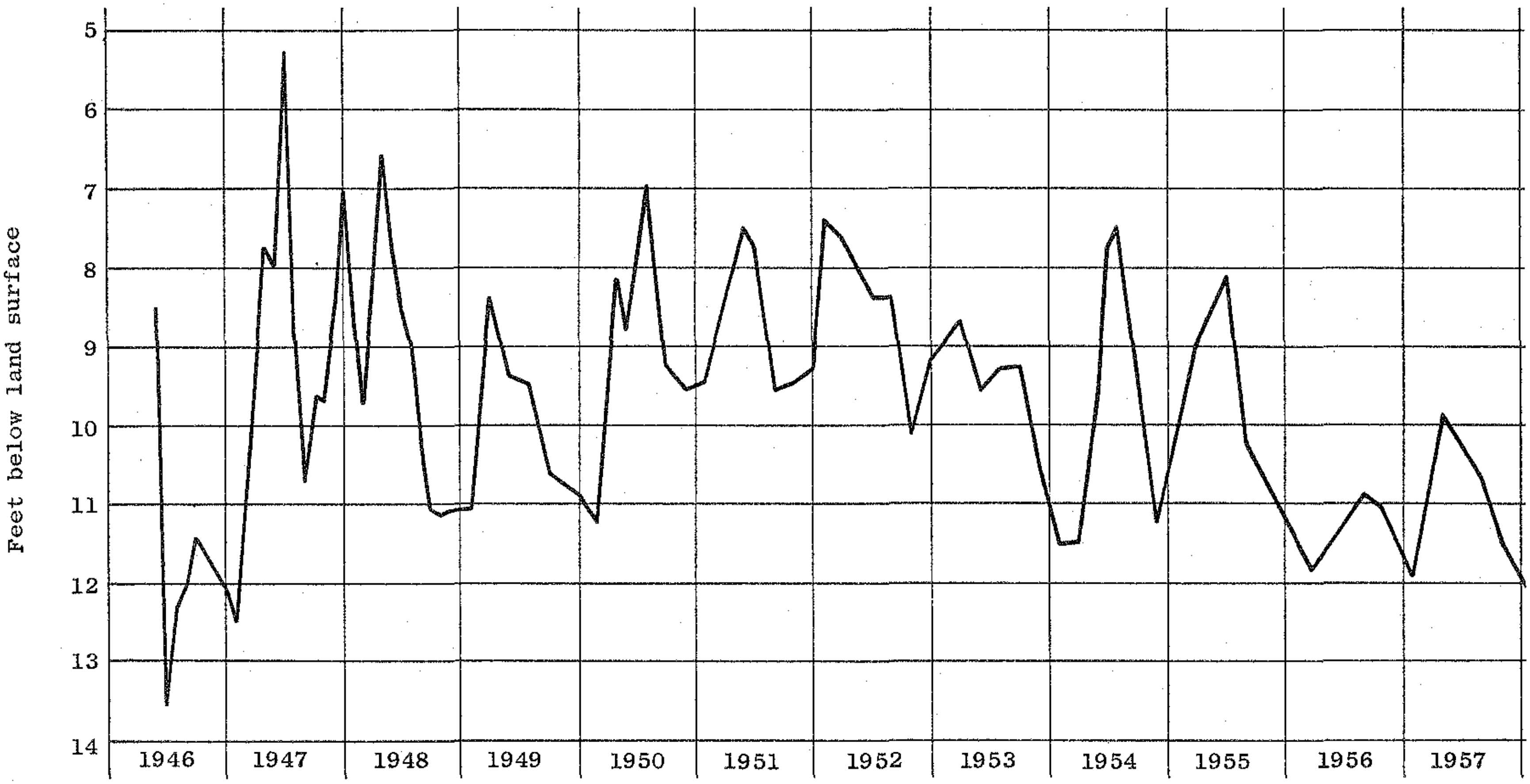

Figure 92.--Hydrograph of well Ml-6/22/20-135.

Milwaukee Co. Leonard Budzein. 920 W. Armour Ave., Milwaukee. NE¼SW¼ sec. 20, T. 6 N., R. 22 E. Dug irrigation water-table well in sand of Pleistocene age, diam 4 ft, reported depth 20 ft, cased to 20. Lsd, 667 ft above msl. MP, top of wooden platform, 2.0 ft below lsd. Measured bi-monthly. All plotted.

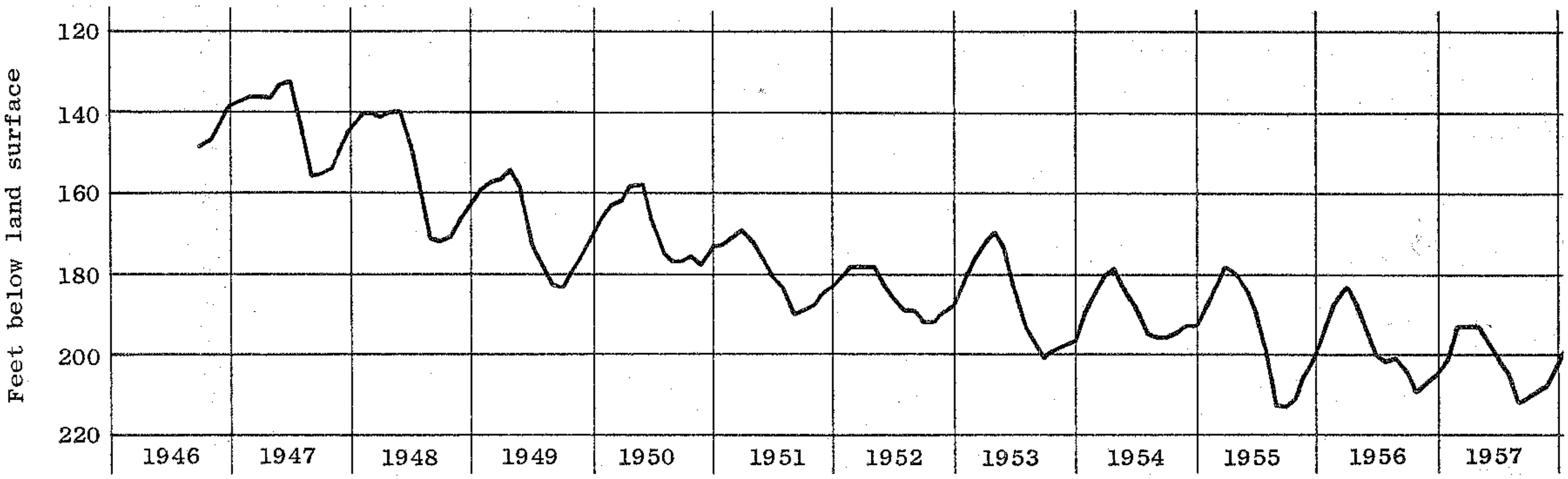

Figure 93.--Hydrograph of well Ml-7/21/12-36.

Milwaukee Co. A. O. Smith Corp. NE¼SE¼ sec. 12, T. 7 N., R. 21 E. Drilled unused artesian well in St. Peter sandstone, diam 14 in, reported depth 1,091 ft, cased to 774. Lsd, 673 ft above msl. MP, top of flange, 3.00 ft above lsd. Measured monthly. All plotted. Recording gage before May 1956.

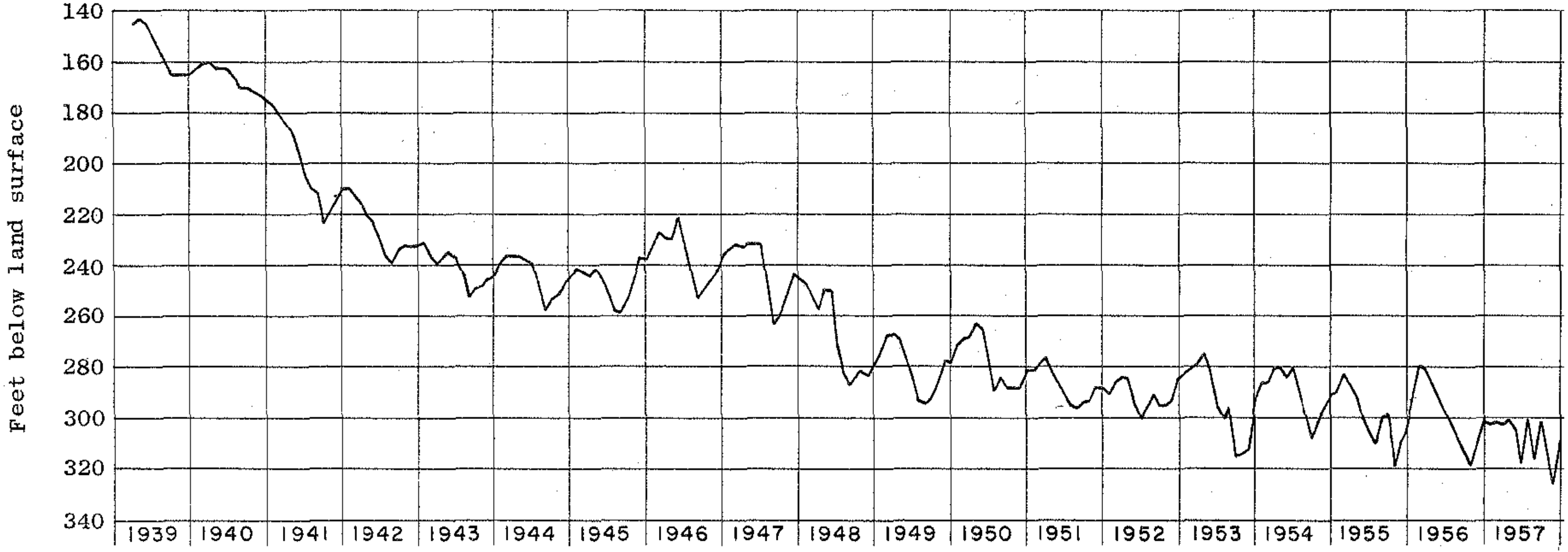

Figure 94.--Hydrograph of well Ml-7/21/34-22.

Milwaukee Co. Allis Chalmers. 1126 S. 70th Street, West Allis. NW$\frac{1}{4}$SW$\frac{1}{4}$ sec. 34, T. 7 N., R. 21 E. Drilled industrial artesian well in Niagara dolomite, sandstone of Cambrian age, and St. Peter sandstone, diam 16 in, reported depth 1,690 ft, cased to 146, 12 in liner 485-585. Lsd, 728 ft above msl. MP, pump base, at lsd. Measured monthly. All plotted.

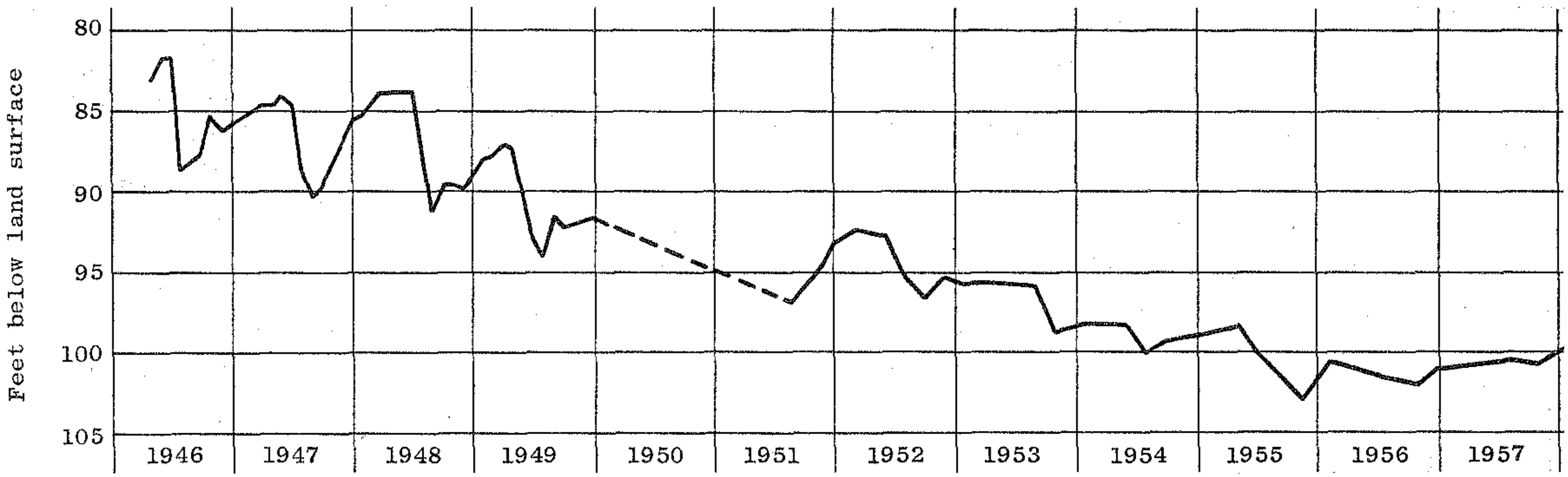

Figure 95.--Hydrograph of well Ml-7/22/17-120.

Milwaukee Co. Nunn-Bush Shoe Co. North 5th and Hadley Sts., Milwaukee. SE¼NW¼ sec. 17, T. 7 N., R. 22 E. Drilled unused artesian well in Niagara dolomite, diam 10 in, reported depth 400 ft, cased to 104. Lsd, 685 ft above msl. MP, top of concrete, 8.75 ft below lsd. Measured bi-monthly. All plotted. Recording gage before September 1949.

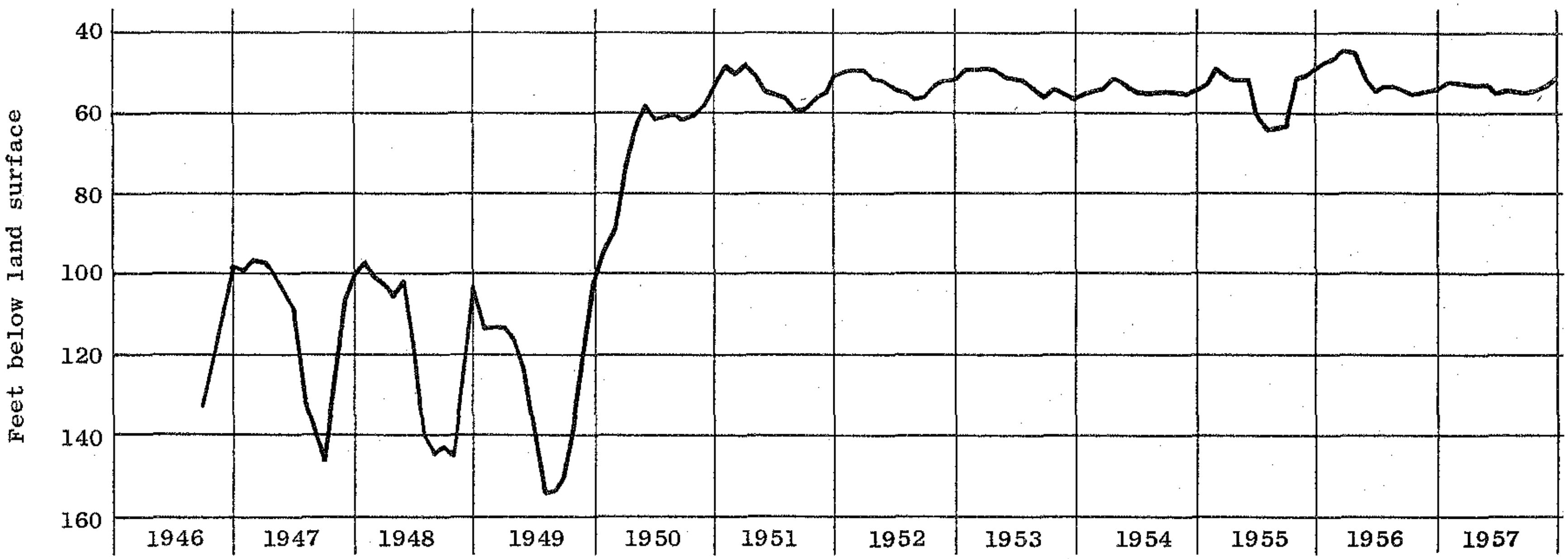

Figure 96.--Hydrograph of well Ml-7/22/29-45.

Milwaukee Co. Milwaukee Journal. NW¼NE¼ sec. 29, T. 7 N., R. 22 E. Drilled unused artesian well in Niagara dolomite, diam 8 to 5 in, depth 1,015 ft, cased to 1,015, ruptured 146-505. Lsd, 591 ft above msl. MP, top of casing, 7.0 ft below lsd. Recording gage. Lowest monthly plotted.

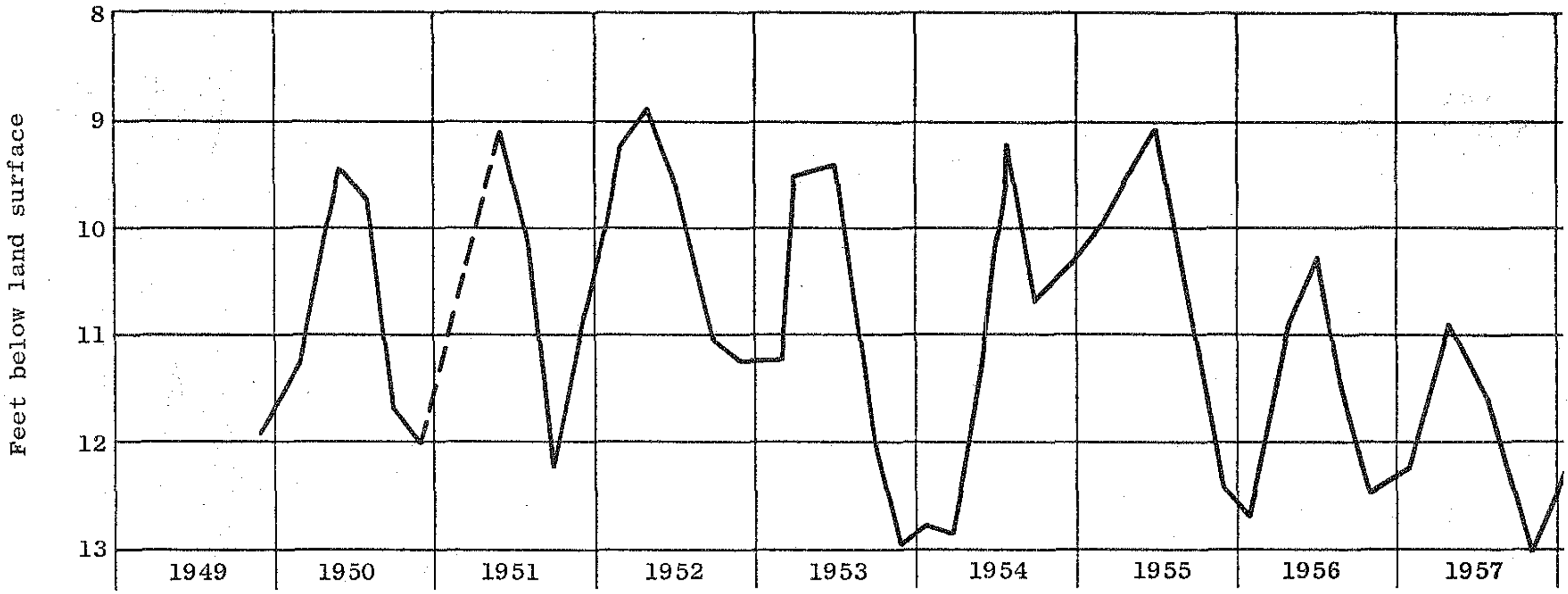

Figure 97.--Hydrograph of well Ml-8/21/3-231.

Milwaukee Co. R. J. Cerletty. 8900 N. 76th Street, Milwaukee. SW¼SW¼ sec. 3, T. 8 N., R. 21 E. Drilled domestic artesian well in Niagara dolomite, diam 6 in, depth 80 ft, cased to 58. Lsd, 695 ft above msl. MP, top of casing, 2.5 ft above lsd. Measured bi-monthly. All plotted.

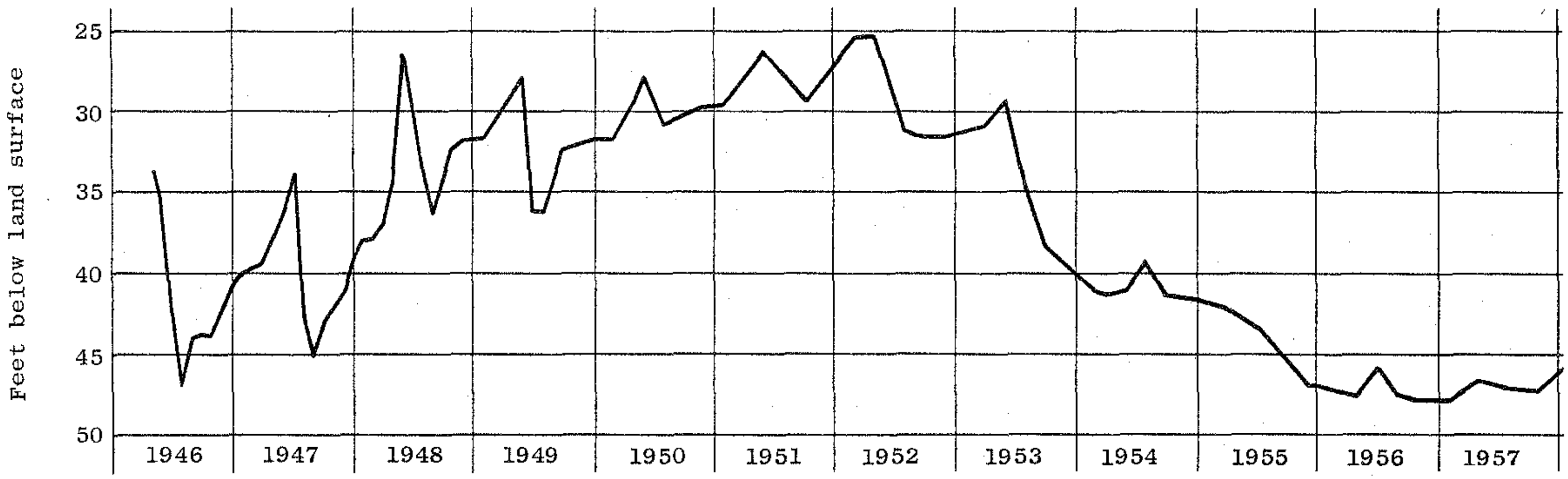

Figure 98.--Hydrograph of well Ml-8/21/35-118.

Milwaukee Co. A. Schaefer. 5465 N. 51st Street, Milwaukee. NE$\frac{1}{4}$NW$\frac{1}{4}$ sec. 35, T. 8 N., R. 21 E. Drilled domestic artesian well in Niagara dolomite, diam 6 in, depth 135 ft. Lsd, 679.25 ft above msl. MP, top of casing, 0.6 ft above lsd. Measured bi-monthly. All plotted.

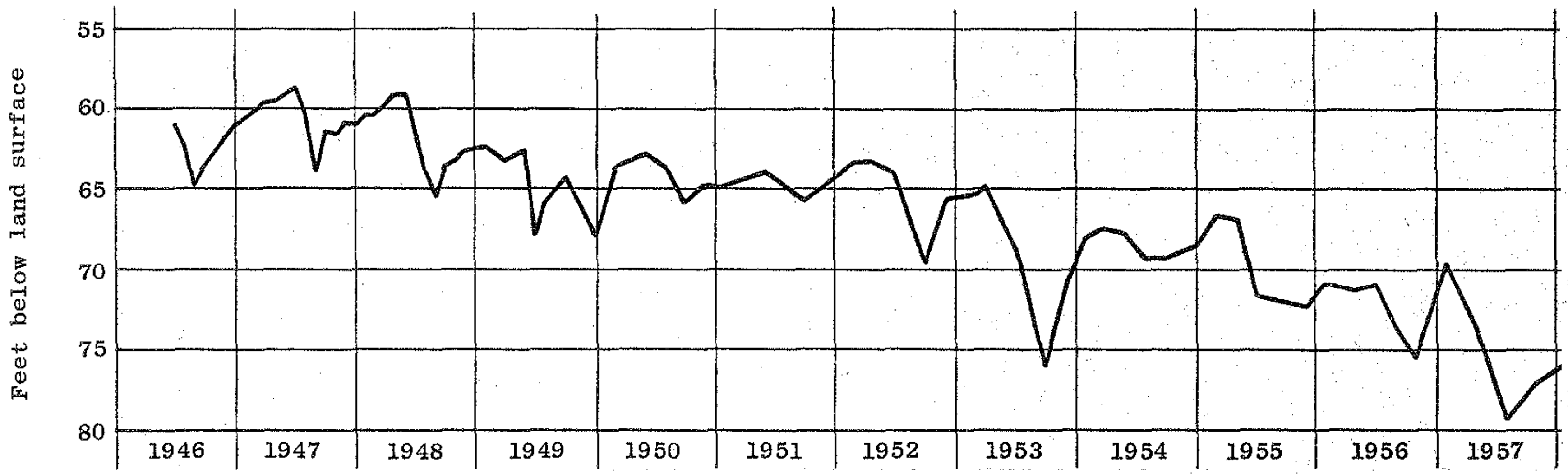

Figure 99.--Hydrograph of well Ml-8/22/4-146.

Milwaukee Co. Stanley Larsen. 9090 Lake Dr., Milwaukee. SE¼SW¼ sec. 4, T. 8 N., R. 22 E. Drilled unused artesian well in Niagara dolomite, diam 5 in, depth 116 ft. Lsd, 680 ft above msl. MP, top of casing, 5.00 ft below lsd. Measured bi-monthly. All plotted.

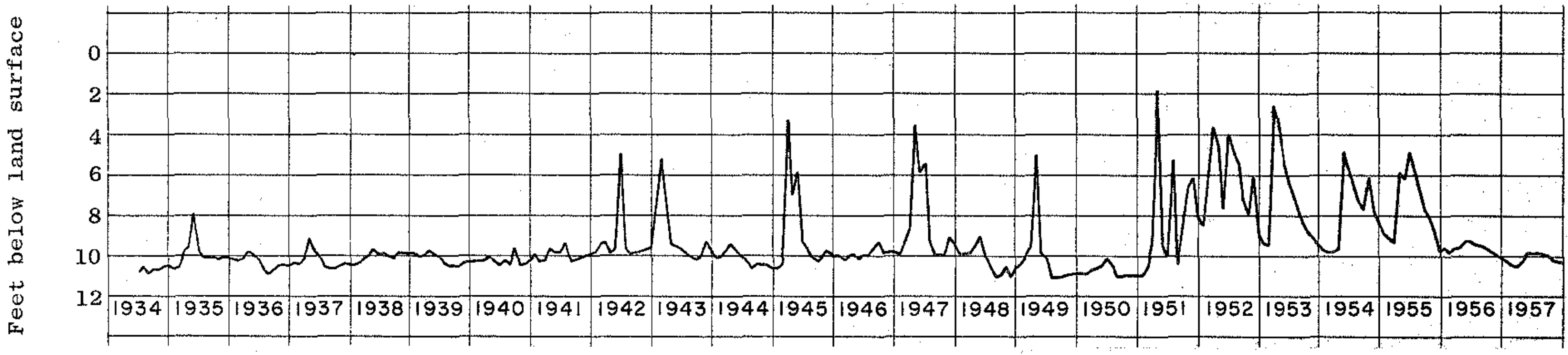

Figure 100.--Hydrograph of well Mo-15/3W/5-10.

Monroe Co. Lester Cooley. NW¼NW¼ sec. 5, T. 15 N., R. 3 W. Bored unused water-table well in sand of Pleistocene and Recent age, diam 7 in, depth 17 ft, cased to 17. Lsd, 880 ft above msl. MP, top of casing, 0.9 ft above lsd. Measured monthly. All plotted.

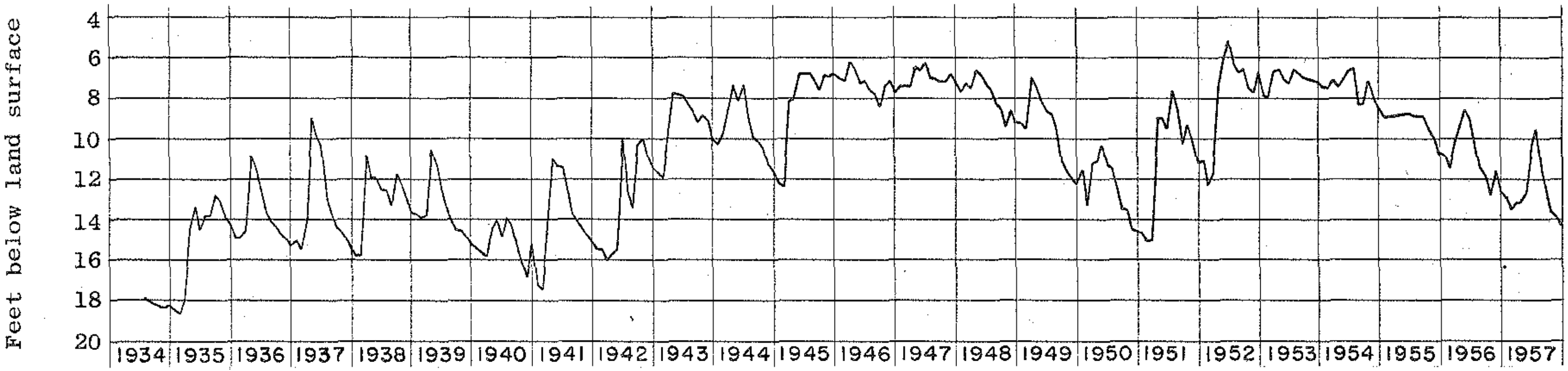

Figure 101.--Hydrograph of well Mo-15/4W/34-2.

Monroe Co. Joseph Anderson. SE¼SE¼ sec. 34, T. 15 N., R. 4 W. Drilled unused water-table well in sandstone of Cambrian age, diam 5 in, depth 44 ft. Lsd, 1,100 ft above msl. MP, top of casing, 0.50 ft above lsd. Measured monthly. All plotted.

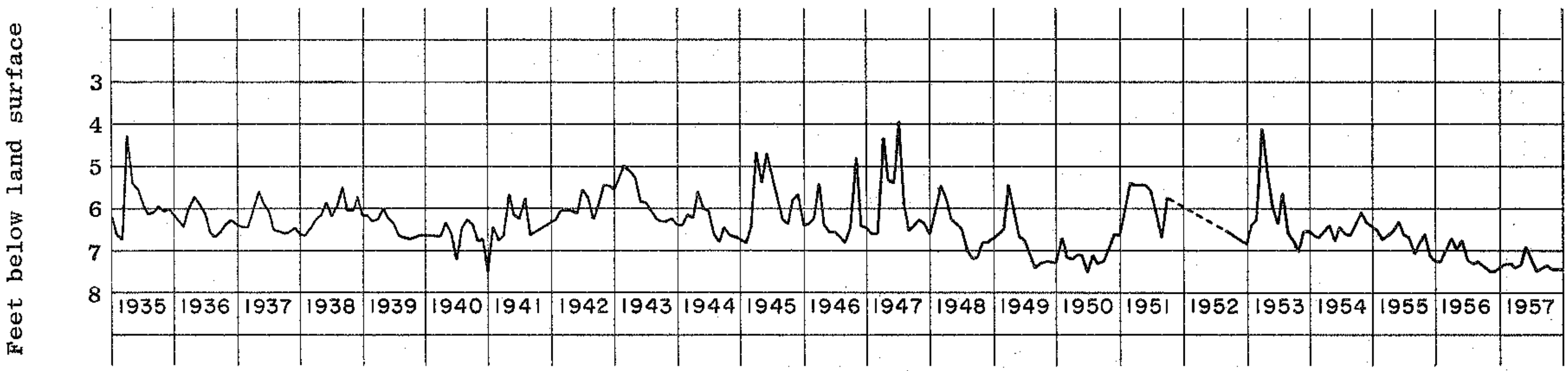

Figure 102.--Hydrograph of well Mo-16/3W/27-11.

Monroe Co. John Sullivan. SW¼NW¼ sec. 27, T. 16 N., R. 3 W. Bored unused water-table well in sand of Pleistocene and Recent age, diam 7 in, depth 11 ft. Lsd, 925 ft above msl. MP, top of casing, 2.5 ft above lsd. Measured monthly. All plotted.

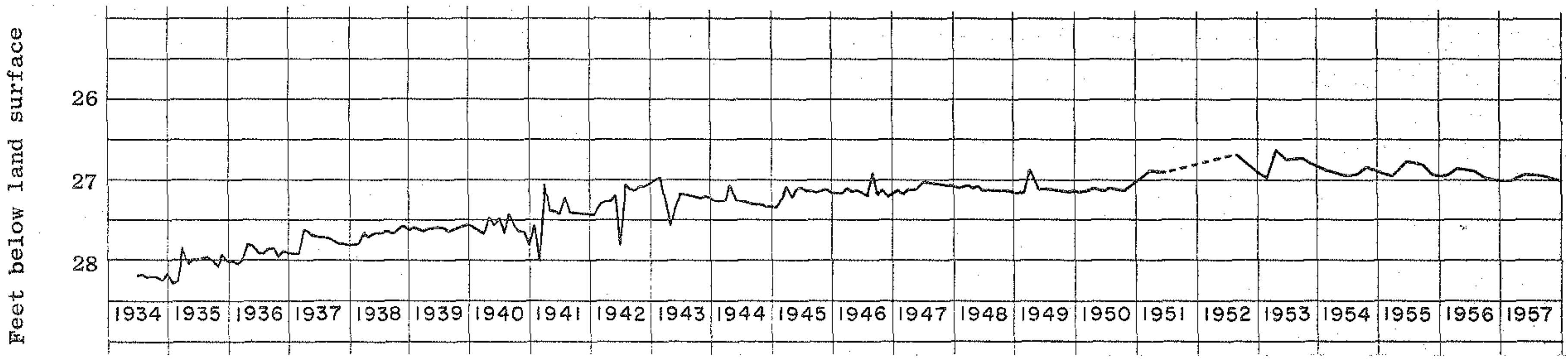

Figure 103.--Hydrograph of well Mo-16/4W/32-12.

Monroe Co. Robert S. Olson. SE¼SE¼ sec. 32, T. 16 N., R. 4 W. Drilled unused water-table well in sandstone of Cambrian age, diam 6 in, depth 31 ft, cased to 31. Lsd, 1,020 ft above msl. MP, top of casing, 0.6 ft above lsd. Measured bi-monthly. All plotted. Measured monthly before 1951.

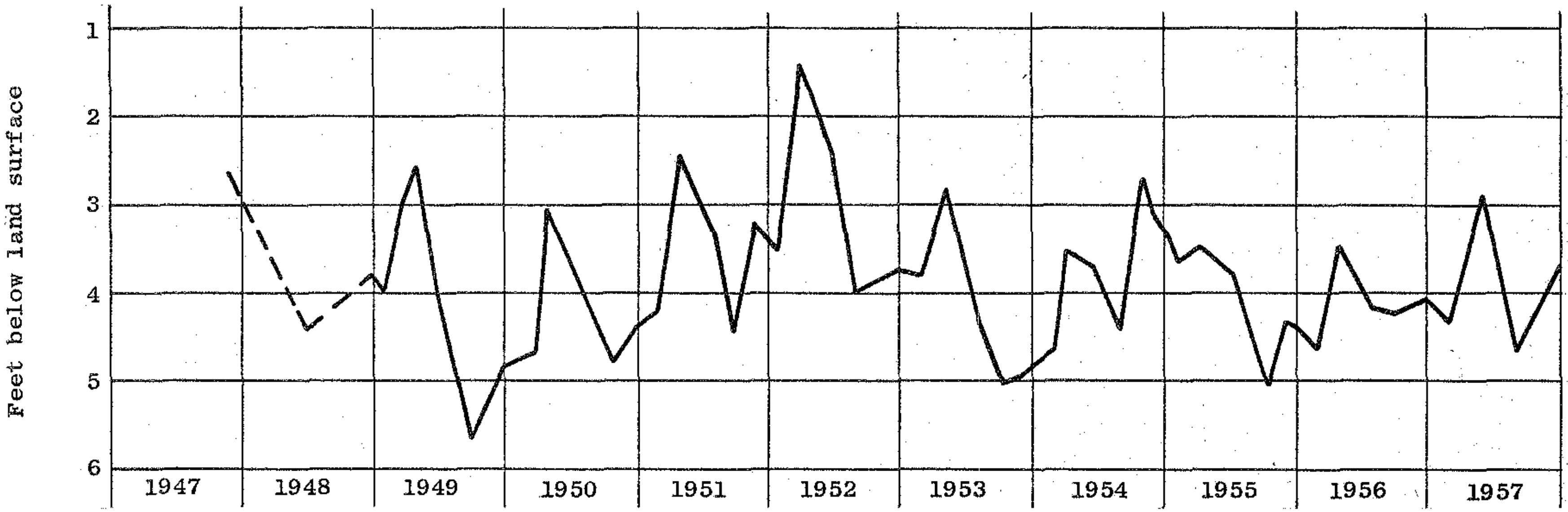

Figure 104.--Hydrograph of well Mo-17/1W/1-1.

Monroe Co. Nicholas Moran. SW¼SW¼ sec. 1, T. 17 N., R. 1 W. Drilled stock water-table well in sand of Pleistocene and Recent age, diam 6 in, reported depth 12 ft. MP, hole in pump base, at lsd. Measured bi-monthly. All plotted.

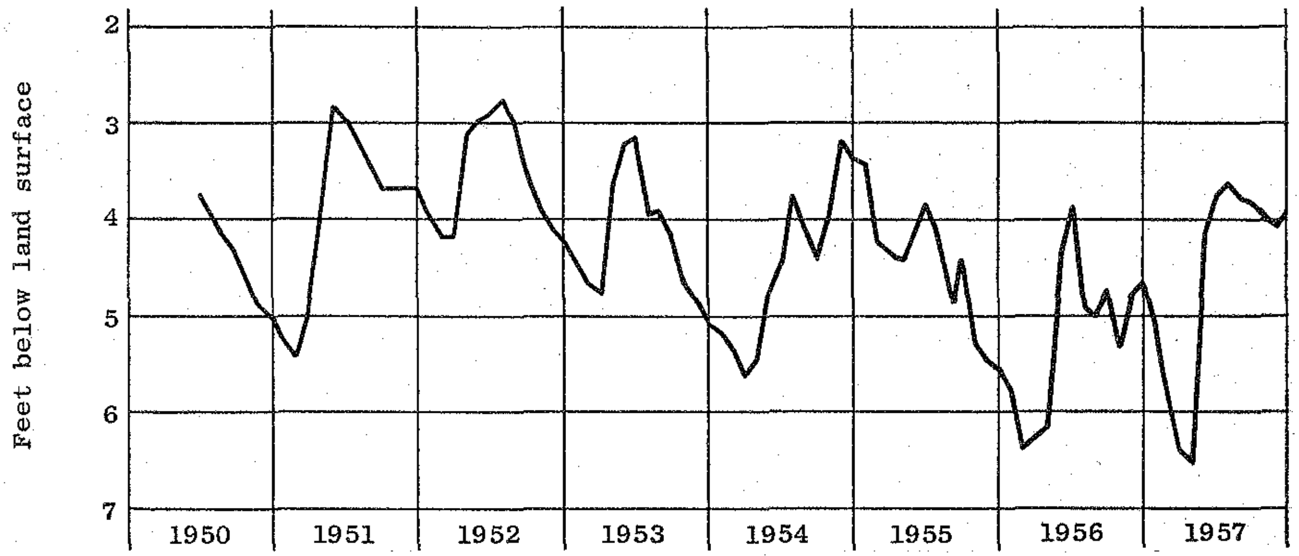

Figure 105.--Hydrograph of well Mo-18/2W/29-17.

Monroe Co. U. S. Army, Camp McCoy. NW¼SW¼ sec. 29, T. 18 N., R. 2 W. Drilled unused artesian well in sandstone of Cambrian age, diam 9 in, depth 192 ft, cased to 109. MP, top of casing, 1.00 ft above lsd. Recording gage. Lowest monthly plotted.

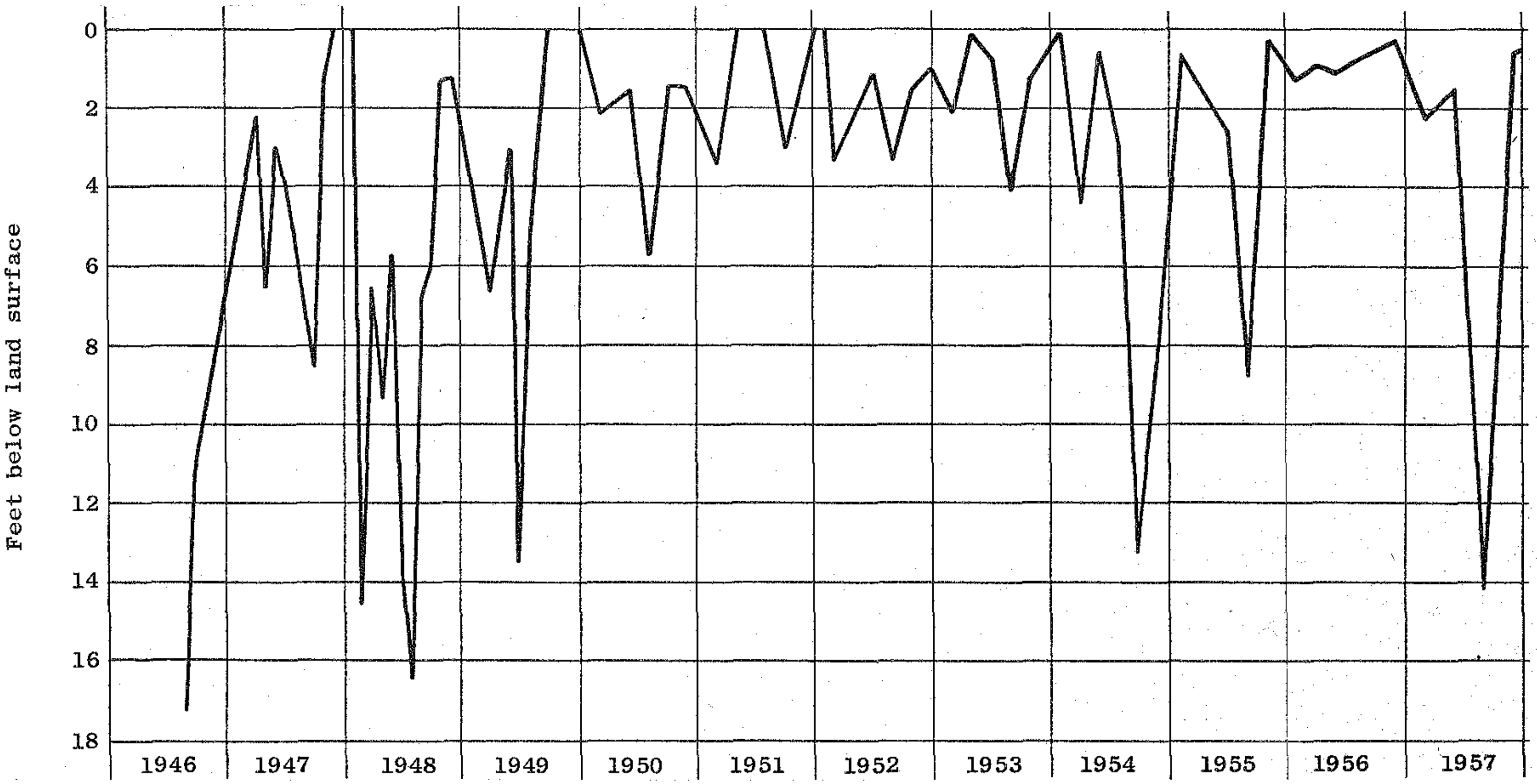

Figure 106.--Hydrograph of well Oc-28/22/19-1.

Oconto Co. Oconto Utilities. NW¼NW¼ sec. 19, T. 28 N., R. 22 E. Drilled unused artesian well in sandstone of Cambrian age, diam 6 in. Lsd, 591 ft above msl. MP, hole in cap on casing, at lsd. Measured bi-monthly. All plotted.

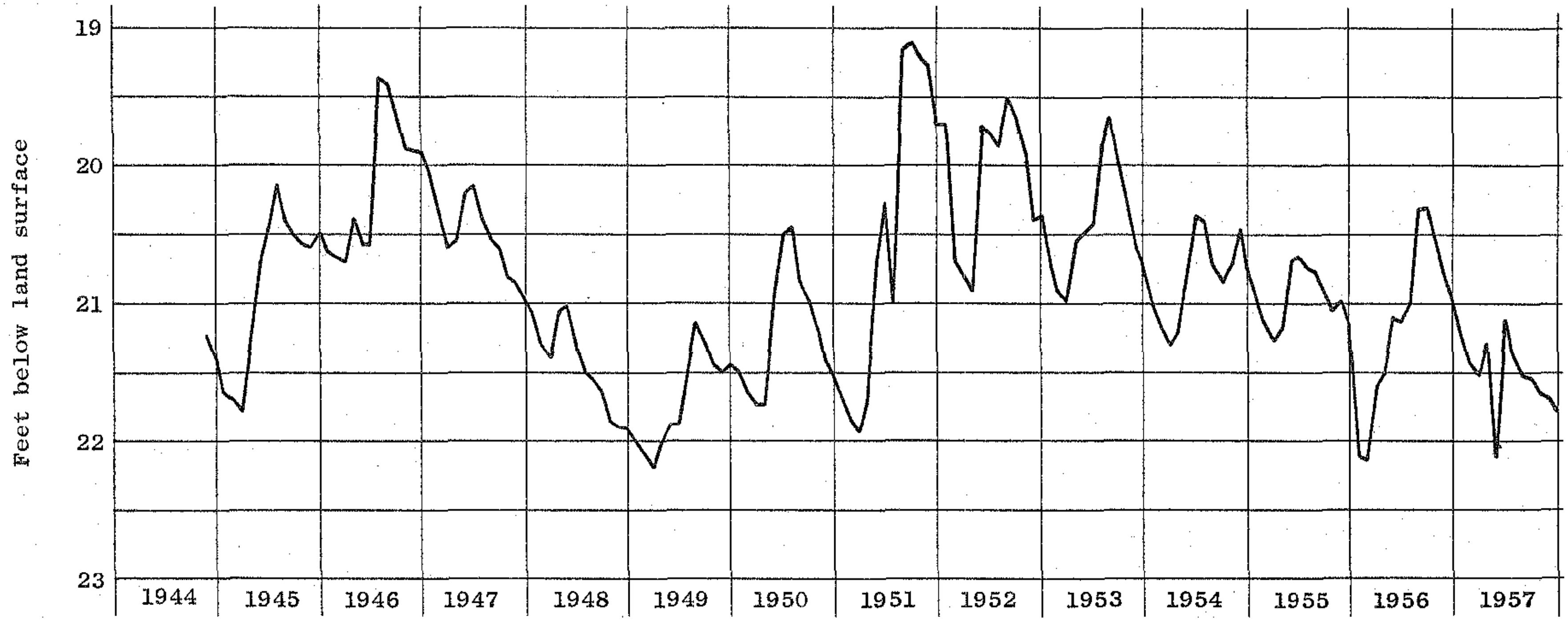

Figure 107.--Hydrograph of well On-36/9/9-24.

Oneida Co. U. S. Geol. Survey. NE¼NE¼ sec. 9, T. 36 N., R. 9 E. Driven observation water-table well in sand of Pleistocene age, diam 1¼ in, depth 33 ft, cased to 31, well point 31-33. MP, top of collar on casing, 0.80 ft above lsd. Measured weekly. Lowest monthly plotted.

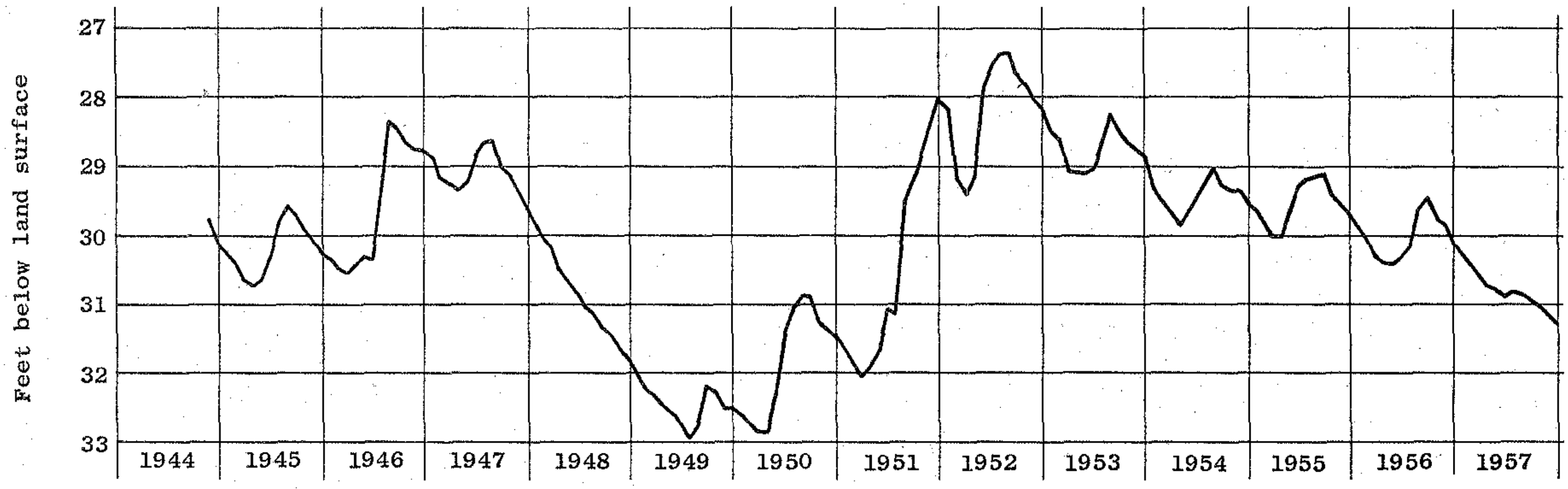

Figure 108.--Hydrograph of well On-37/6/27-23.

Oneida Co. U. S. Geol. Survey. NE¼NE¼ sec. 27, T. 37 N., R. 6 E. Driven observation water-table well in sand of Pleistocene age, diam 1¼ in, depth 37 ft, well point 35-37. Lsd, 1,529 ft above msl. MP, top of casing, 1.00 ft above lsd. Measured weekly. Lowest monthly plotted.

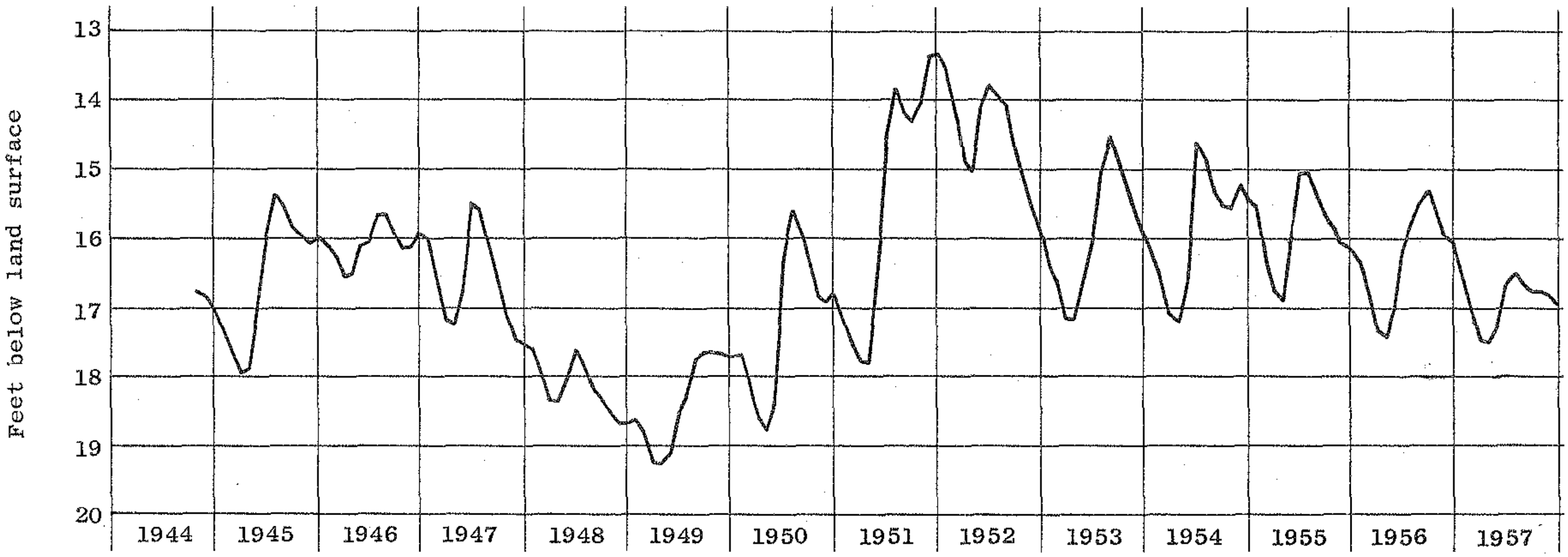

Figure 109.--Hydrograph of well On-39/8/18-22.

Oneida Co. Wisconsin Valley Improvement Co. SE$\frac{1}{4}$NW$\frac{1}{4}$ sec. 18, T. 39 N., R. 8 E. Jetted unused water-table well in gravel of Pleistocene age, diam 6 in, depth 27 ft, cased to 27. Lsd, 1,607 ft above msl. MP, top of casing, 6.0 ft above lsd. Recording gage. Lowest monthly plotted.

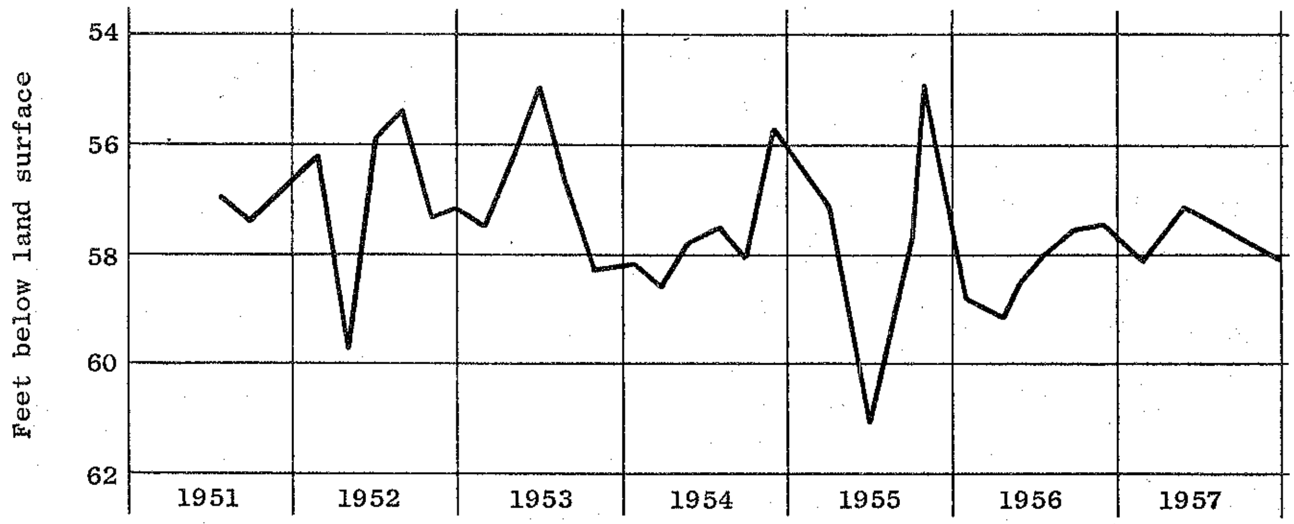

Figure 110.--Hydrograph of well Ou-21/17/15-29.

Outagamie Co. Highland Memorial Park. NE$\frac{1}{4}$SE$\frac{1}{4}$ sec. 15, T. 21 N., R. 17 E. Drilled industrial artesian well in sandstone of Cambrian age, reported depth 300 ft. Lsd, 839 ft above msl. MP, top of breather hole, 2.0 ft above lsd. Measured bi-monthly. All plotted.

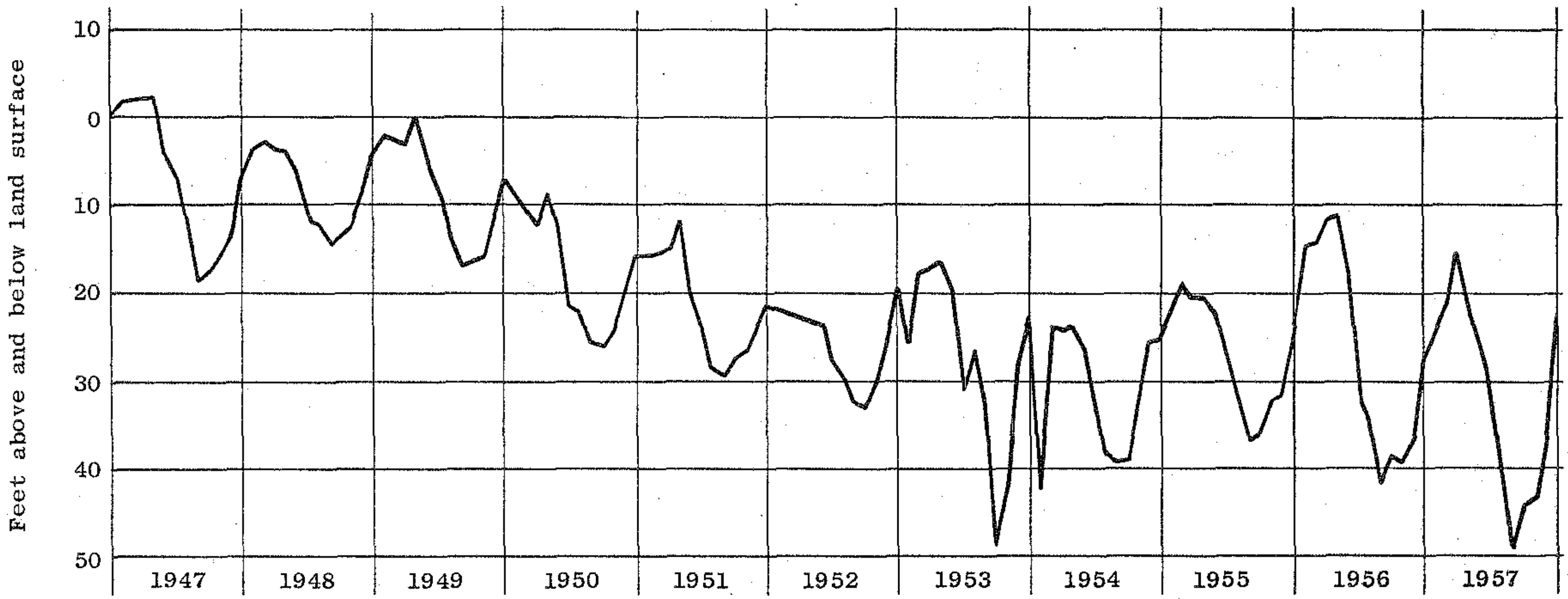

Figure 111.--Hydrograph of well Ou-21/18/24-2.

Outagamie Co. City of Kaukauna. Kaukauna Water & Electric Co. NE¼SW¼ sec. 24, T. 21 N., R. 18 E. Drilled unused artesian well in sandstone of Cambrian age, diam 12 in, reported depth 700 ft, cased to 208. Lsd, 645 ft above msl. MP, top of casing, 8.00 ft above lsd. Recording gage. Lowest monthly plotted.

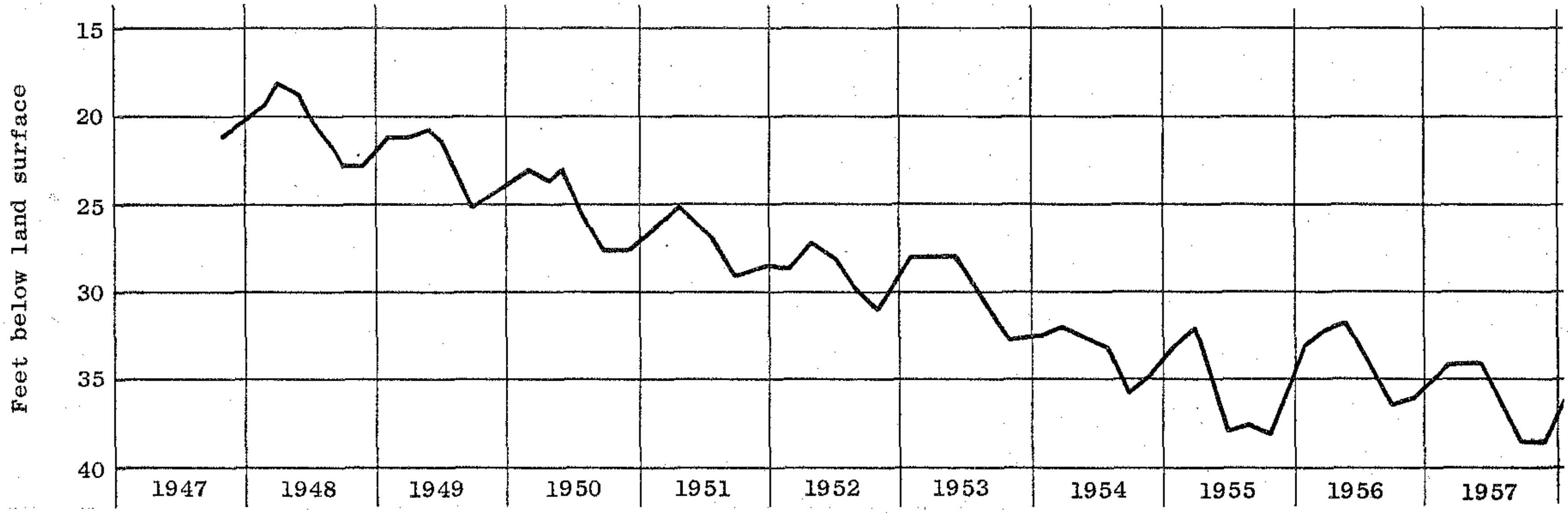

Figure 112.--Hydrograph of well Ou-21/19/4-5.

Outagamie Co. Kaukauna Water and Electric Co. SW¼SE¼ sec. 4, T. 21 N., R. 19 E. Drilled domestic artesian well in St. Peter sandstone, diam 6 in, reported depth 408 ft, cased to 69. Lsd, 660 ft above msl. MP, hole in pump base, 3.45 ft below lsd. Measured bi-monthly. All plotted.

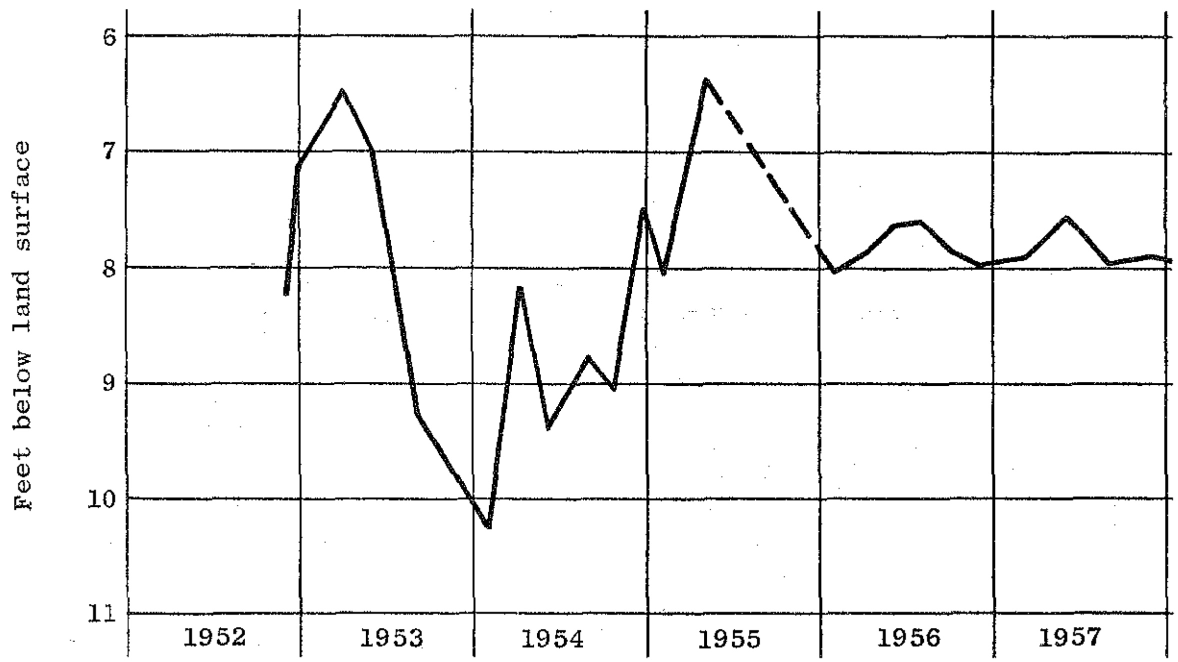

Figure 113.--Hydrograph of well Ou-22/16/20-95.

Outagamie Co. August H. Seehawer. NE¼NW¼ sec. 20, T. 22 N., R. 16 E. Drilled unused water-table well in sand and gravel of Pleistocene age, diam 6 in, reported depth 112 ft, cased to 111. Lsd, 777 ft above msl. MP, top of casing, 1.00 ft above lsd. Measured bi-monthly. All plotted.

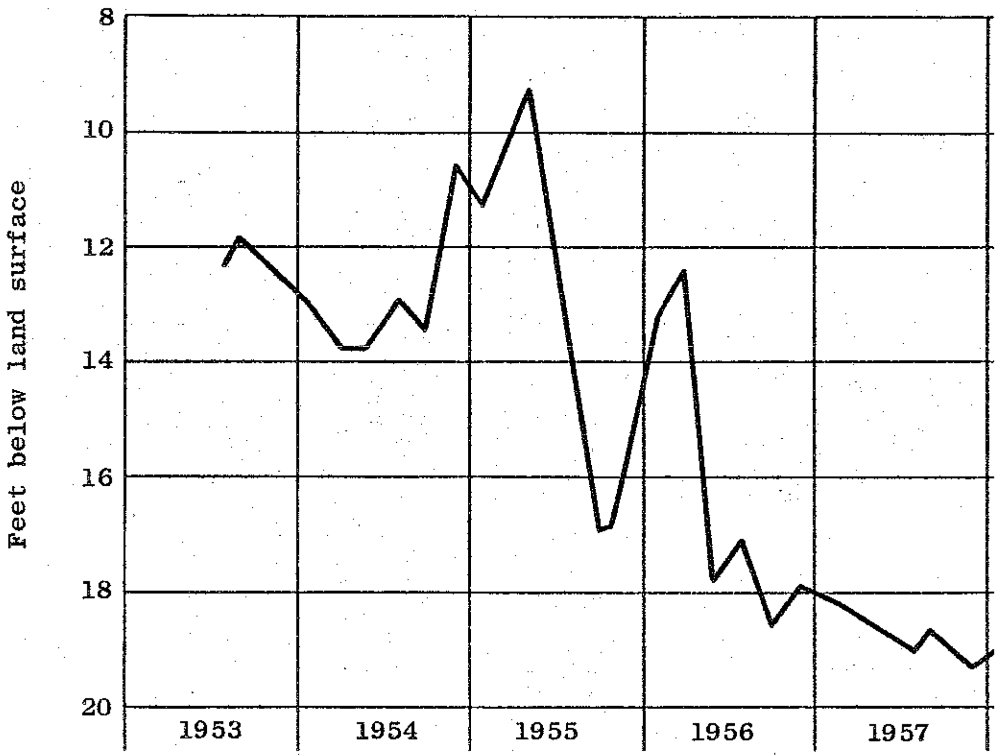

Figure 114.--Hydrograph of well Ou-23/17/8-169.

Outagamie Co. Outagamie Producers Cooperative. SE¼SE¼ sec. 8, T. 23 N., R. 17 E. Drilled unused water-table well in sand and gravel of Pleistocene age, diam 8 in, depth 163 ft, cased to 143, screened 143-163. Lsd, 781 ft above msl. MP, hole in pump base, 4.0 ft below lsd. Measured bi-monthly. All plotted.

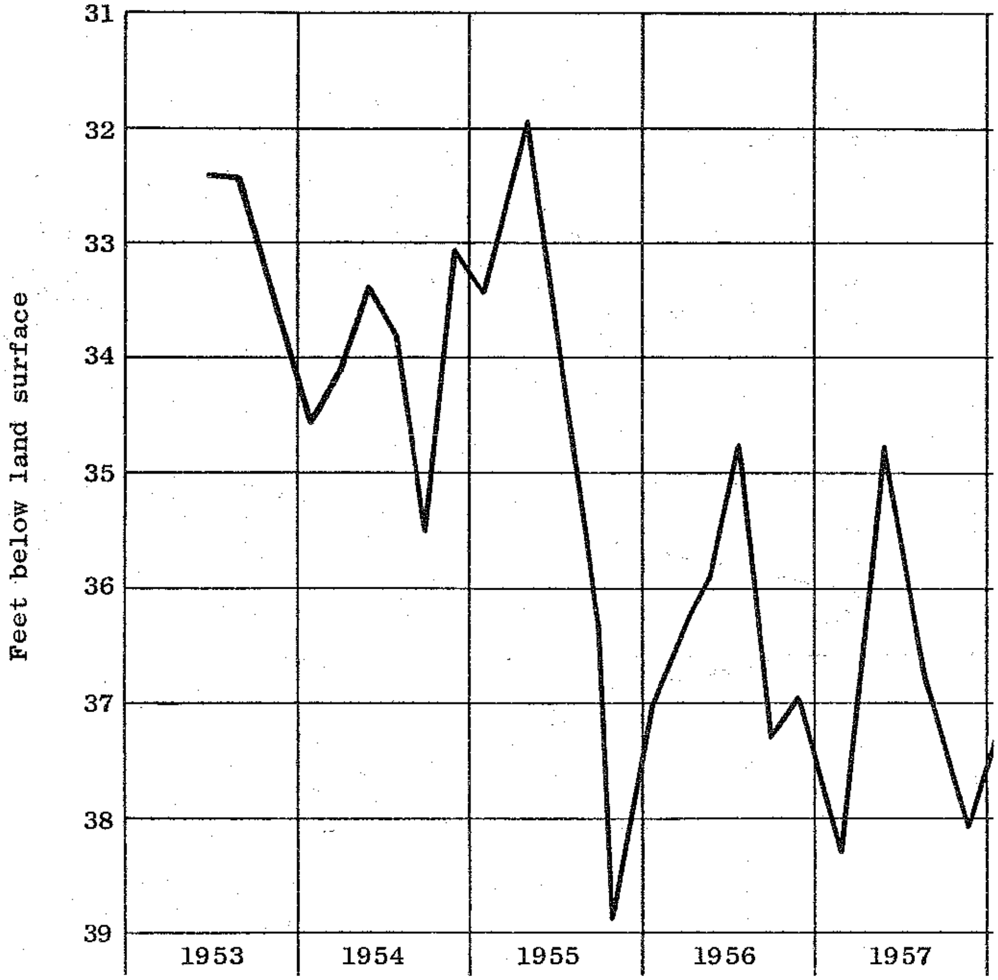

Figure 115.--Hydrograph of well Ou-23/19/30-125.

Outagamie Co. Immaculate Conception Mission. SE¼NE¼ sec. 30, T. 23 N., R. 19 E. Drilled public-supply artesian well in St. Peter sandstone, diam 6 in, reported depth 122 ft, cased to 66. Lsd, 729 ft above msl. MP, breather hole in cap on casing, 1.0 ft above lsd. Measured bi-monthly. All plotted.

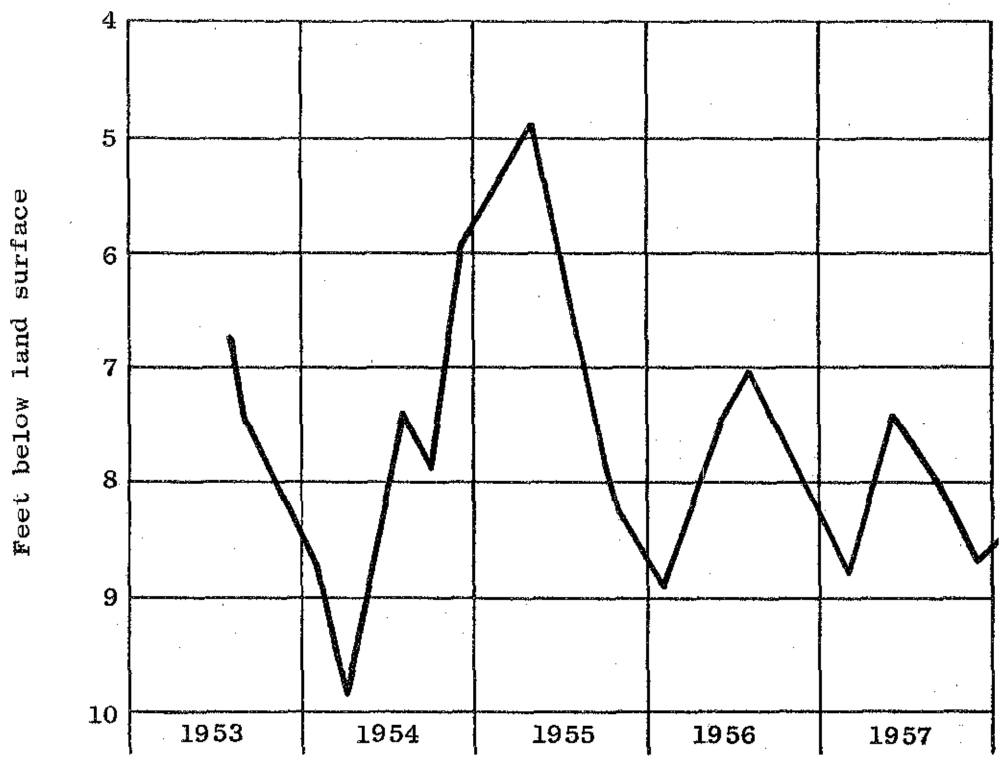

Figure 116.--Hydrograph of well Ou-24/17/8-170.

Outagamie Co. Nichols Paper Products. NE$\frac{1}{4}$SW$\frac{1}{4}$ sec. 8, T. 24 N., R. 17 E. Drilled unused artesian well in sandstone of Cambrian age, diam 6 in, reported depth 131 ft, cased to 78. Lsd, 798 ft above msl. MP, top of casing, 1.0 ft above lsd. Measured bi-monthly. All plotted.

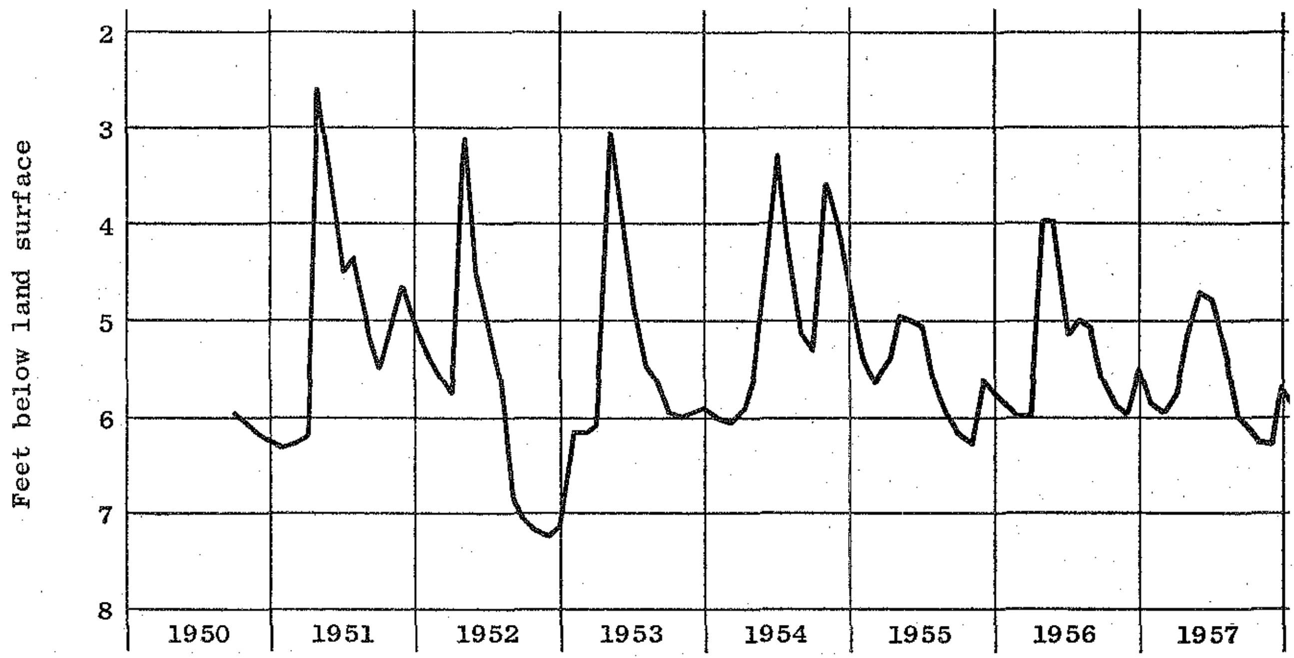

Figure 117.--Hydrograph of well Pt-21/8/10-36.

Portage Co. U. S. Geol. Survey. SE$\frac{1}{4}$NE$\frac{1}{4}$ sec. 10, T. 21 N., R. 8 E. Driven observation water-table well in sand of Pleistocene age, diam 1$\frac{1}{4}$ in, depth 12 ft, cased to 10, well point 10-12. Lsd, 1,076 ft above msl. MP, top of casing, 1.5 ft above lsd. Measured weekly. Lowest monthly plotted.

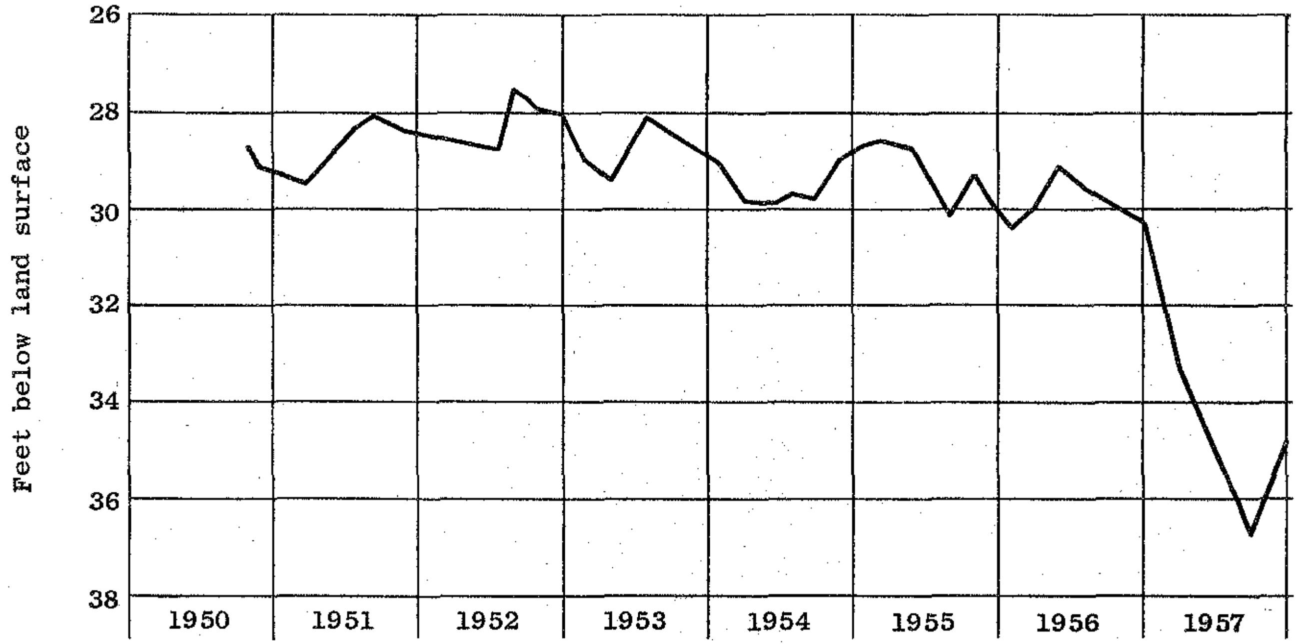

Figure 118.--Hydrograph of well Pt-21/9/29-43.

Portage Co. Alton Bowden. SE¼SW¼ sec. 29, T. 21 N., R. 9 E. Drilled unused water-table well in sand and gravel of Pleistocene age, diam 6 in, depth 40 ft. Lsd, 1,130 ft above msl. MP, lower edge of pump base, at lsd. Measured bi-monthly. All plotted.

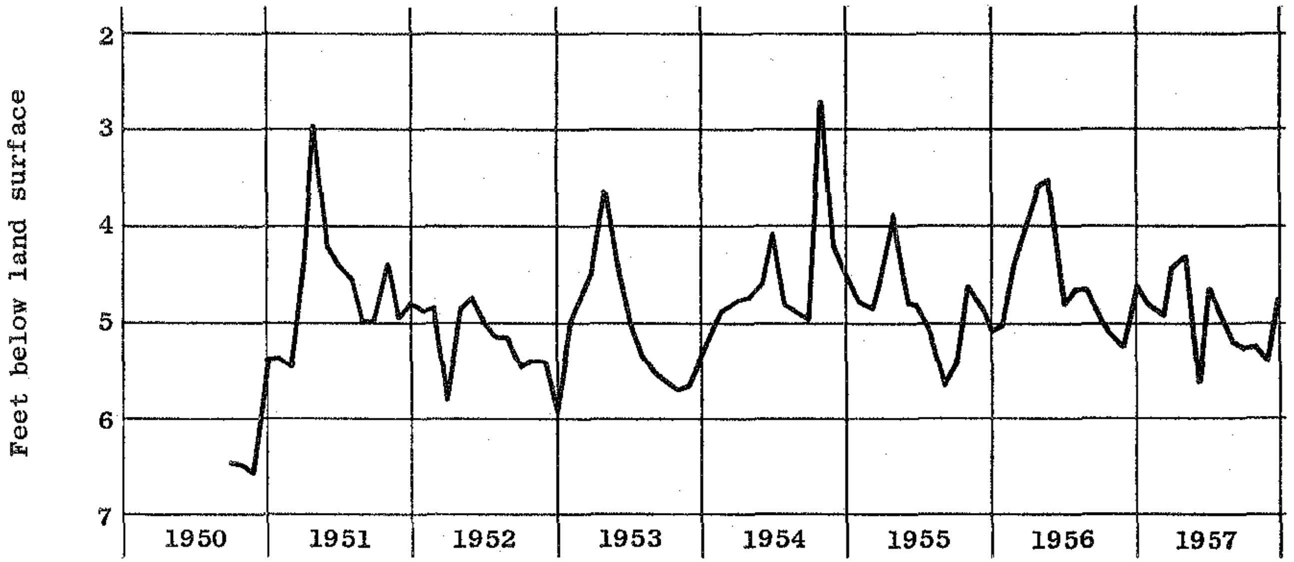

Figure 119.--Hydrograph of well Pt-22/7/35-35.

Portage Co. U. S. Geol. Survey. NW¼NW¼ sec. 35, T. 22 N., R. 7 E. Driven observation water-table well in sand of Pleistocene age, diam 1¼ in, depth 11 ft, well point 9-11. Lsd, 1,055 ft above msl. MP, rim of casing, 1.00 ft above lsd. Measured weekly. Lowest monthly plotted.

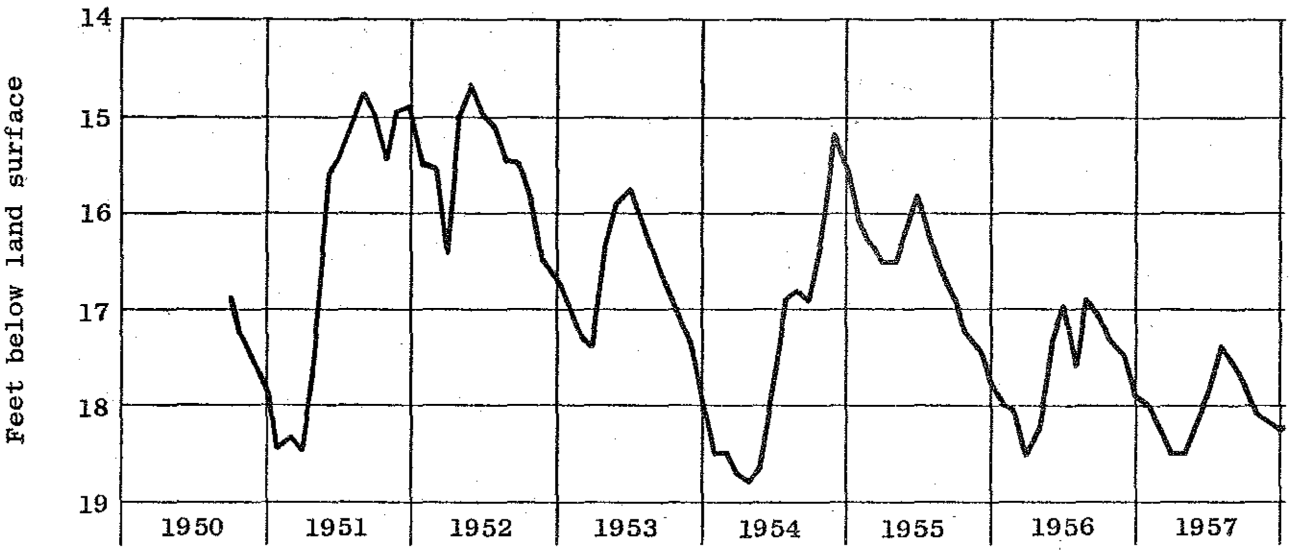

Figure 120A.--Hydrograph of well Pt23/7/34-34.

Portage Co. U. S. Geol. Survey. SE¼NE¼ sec. 34, T. 23 N., R. 7 E. Driven observation water-table well in sand and gravel of Pleistocene age, diam 1¼ in, depth 22 ft, cased to 20, well point 20-22. Lsd, 1,066 ft above msl. MP, top of casing, 1.5 ft above lsd. Measured weekly. Lowest monthly plotted.

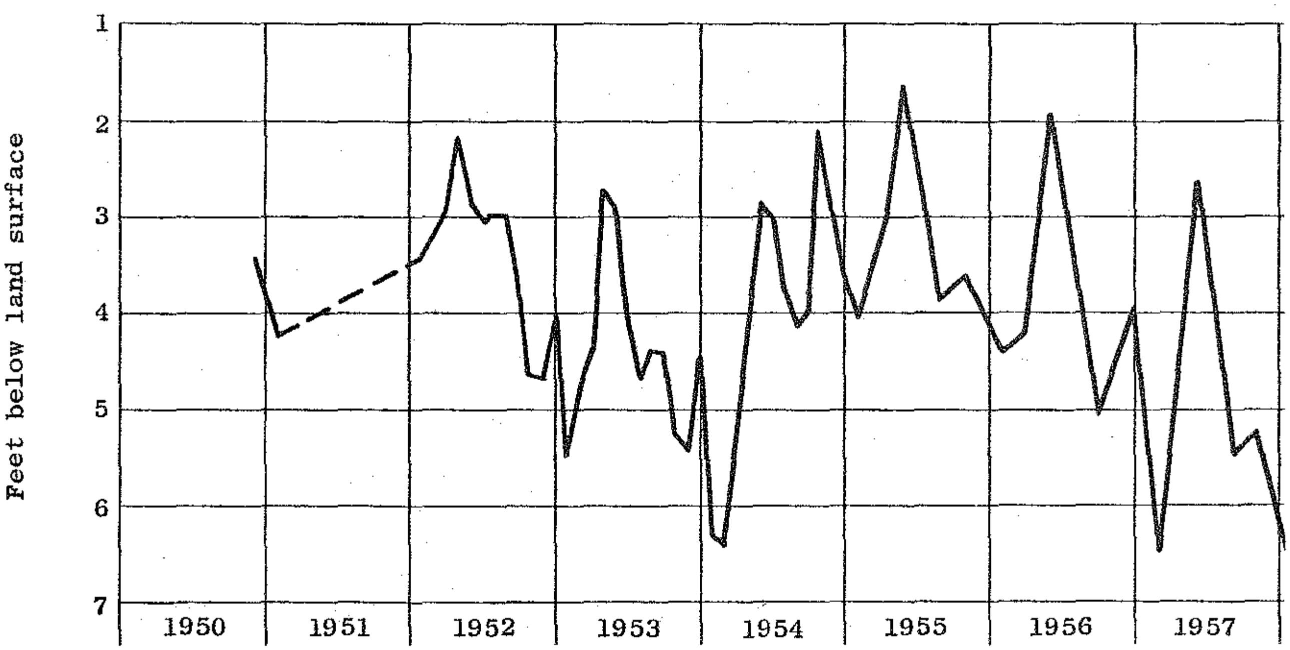

Figure 120B.--Hydrograph of well Pt-24/6/2-82.

Portage Co. Bordens Condensery, Junction City. NW¼SW¼ sec. 2, T. 24 N., R. 6 E. Dug unused water-table well in Precambrian granite, diam 12 ft, reported depth 40 ft, curbed to 40. Lsd, 1,142 ft above msl. MP, top of manhole, 1.0 ft above lsd. Measured bi-monthly. All plotted. Recording gage before March 1955.

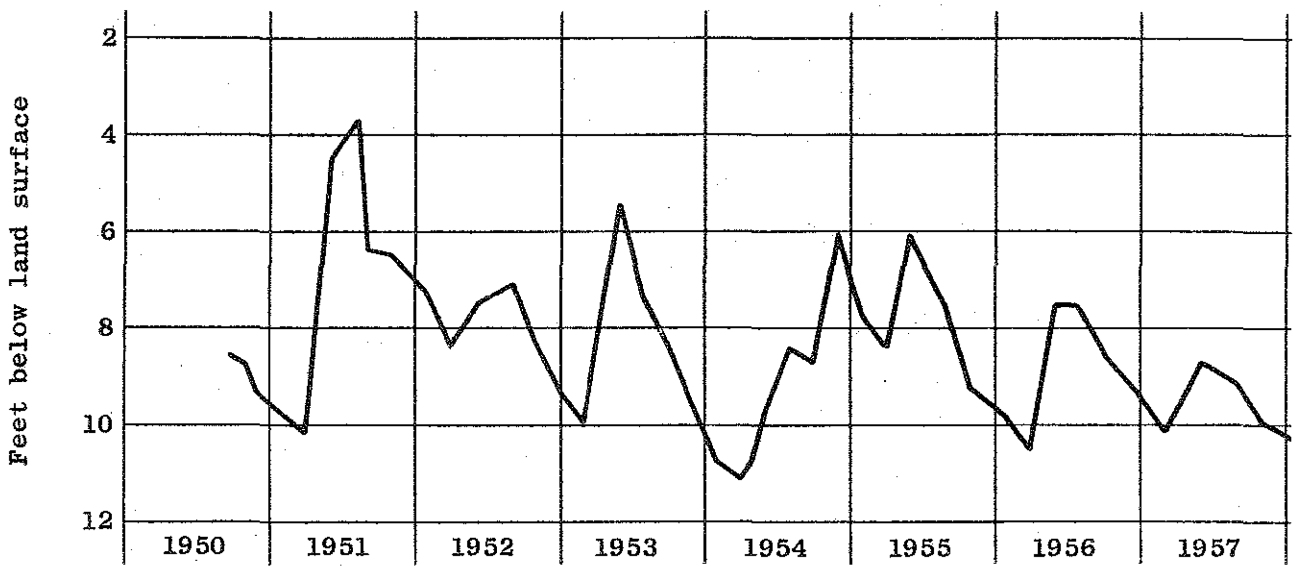

Figure 121A.--Hydrograph of well Pt-24/8/2-40.

Portage Co. U. S. Geol. Survey. NW¼SW¼ sec. 2, T. 24 N., R. 8 E. Driven observation water-table well in sand and gravel of Pleistocene age, diam 1¼ in, depth 13 ft, cased to 11, well point 11-13. Lsd, 1,127 ft above msl. MP, top of casing, 1.0 ft above lsd. Measured bi-monthly. All plotted.

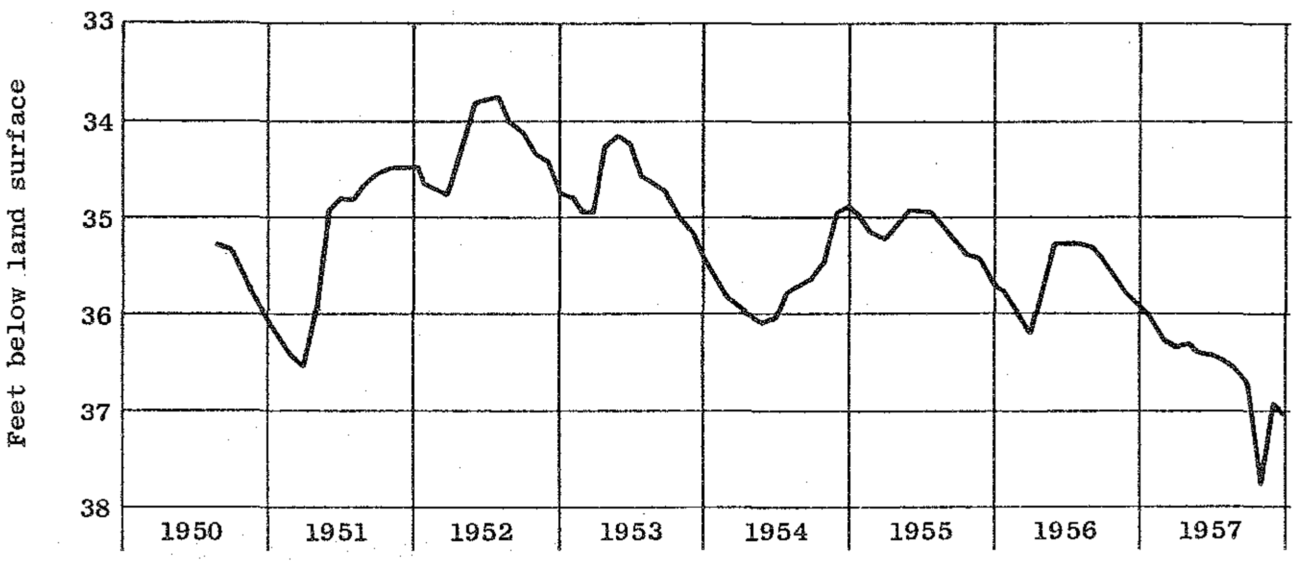

Figure 121B.--Hydrograph of well Pt-24/10/28-15.

Portage Co. Lawrence Krogwold. NE¼SW¼ sec. 28, T. 24 N., R. 10 E. Driven unused water-table well in sand of Pleistocene age, diam 2 in, depth 52 ft, screened 50-52. Lsd, 1,133 ft above msl. MP, rim of casing, 1.50 ft above lsd. Measured weekly. Lowest monthly plotted.

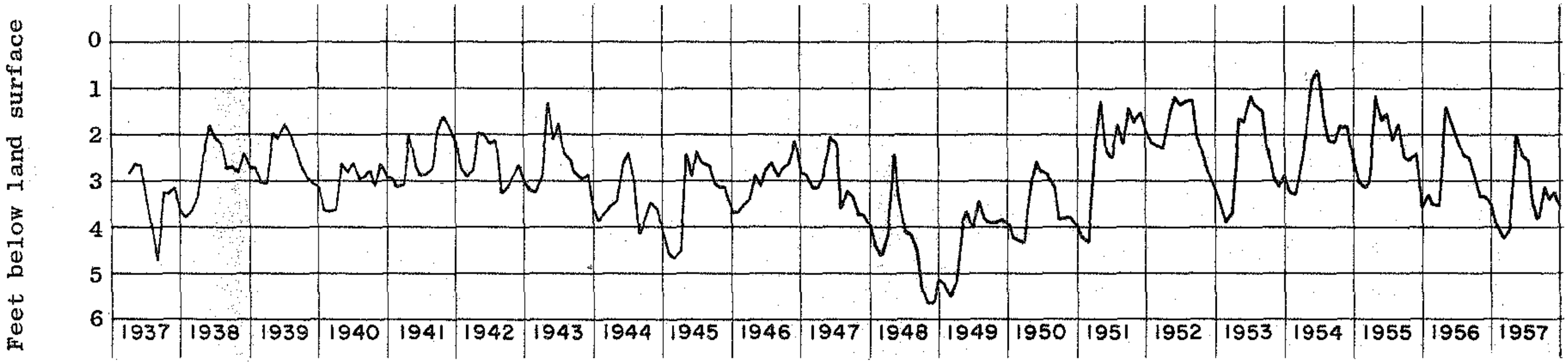

Figure 122.--Hydrograph of well Pr-40/1/24-6.

Price Co. Wisconsin Conservation Dept. NE¼SW¼ sec 24, T. 40 N., R. 1 E. Jetted unused water-table well in sand and gravel of Pleistocene age, diam 8 in, reported depth 13 ft, cased to 13. Lsd, 1,490 ft above msl. MP, top of casing, 5.00 ft above lsd. Measured weekly. Lowest monthly plotted. Measured daily before January 1945.

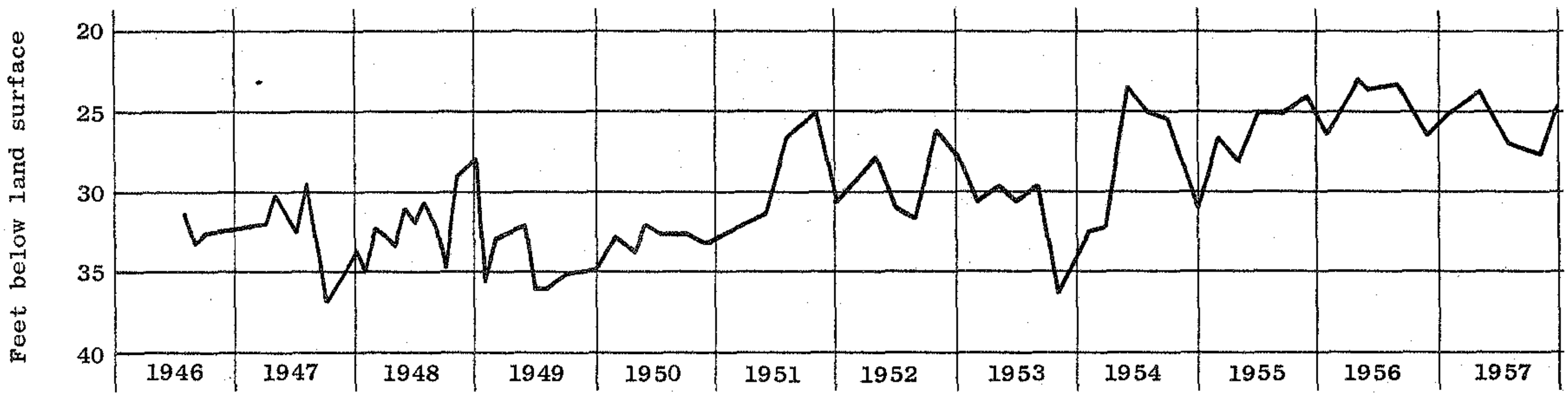

Figure 123.--Hydrograph of well Ra-3/19/32-1.

Racine Co. City of Burlington. Sec. 32, T. 3 N., R. 19 E. Drilled unused artesian well in Galena dolomite and Platteville formation, diam 6 in, reported depth 600 ft. Lsd, 770 ft above msl. MP, top of 4-in pipe on top of casing, 5.00 ft above lsd. Measured bi-monthly. All plotted.

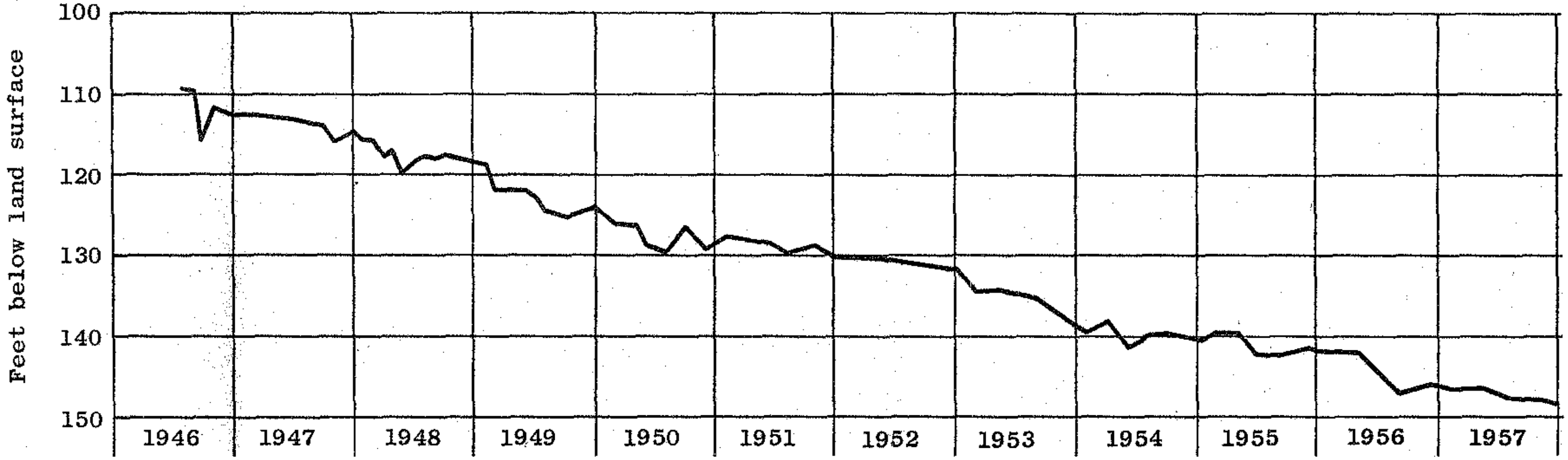

Figure 124.--Hydrograph of well Ra-3/22/21-5.

Racine Co. Chicago, Milwaukee, St. Paul & Pacific Railroad Co. SE¼SW¼ sec. 21, T. 3 N., R. 22 E. Drilled railroad artesian well in sandstone of Cambrian age and St. Peter sandstone, diam 12 in, reported depth 1,176 ft, cased to 586, 10 in liner 976 - 1,083. Lsd, 730 ft above msl. MP, edge of pump base, 1.0 ft above lsd. Measured bi-monthly. All plotted.

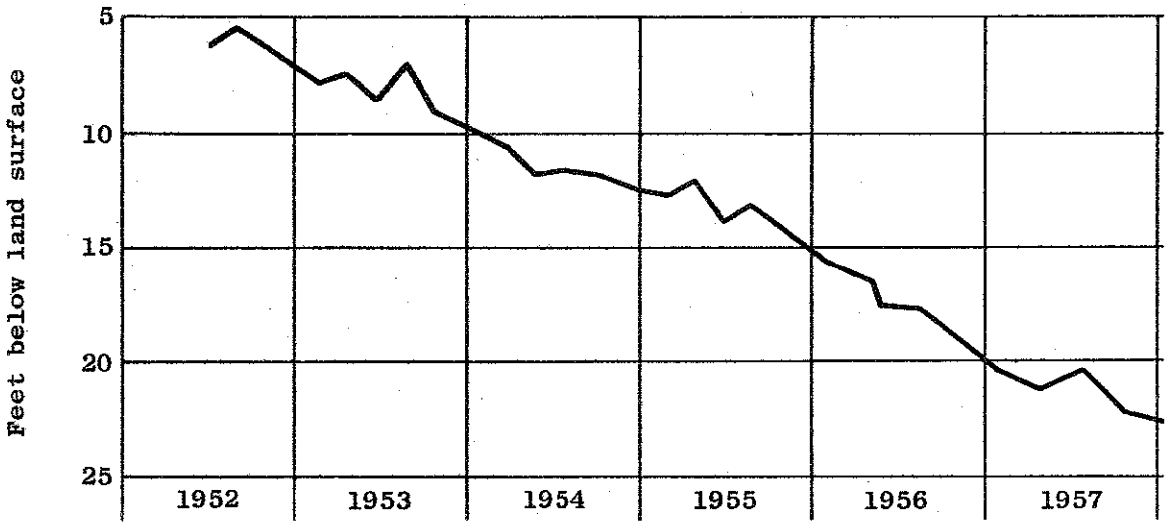

Figure 125A.--Hydrograph of well Ra-3/23/9-23.

Racine Co. Wisconsin Gas & Electric Co., Second & Lake Sts., Racine. NE¼SE¼ sec. 9, T. 3 N., R. 23 E. Drilled unused artesian well in sandstone of Cambrian age, and Niagara dolomite, diam 20 in, reported depth 1,720 ft, cased to 70, 12 in liner 347 - 560. Lsd, 587 ft above msl. MP, top of casing, 4.0 ft below lsd. Measured bimonthly. All plotted.

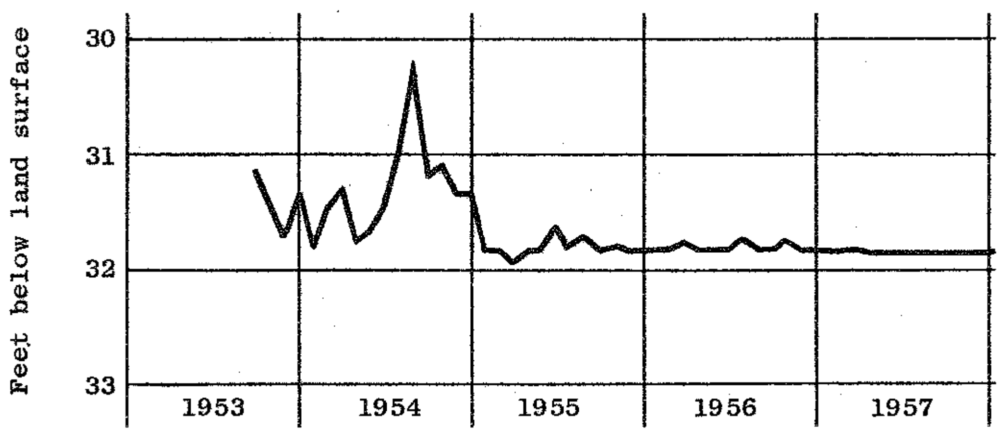

Figure 125B.--Hydrograph of well Ri-12/2/12-5.

Richland Co. Village of Cazenovia. SE¼SE¼ sec. 12, T. 12 N., R. 2 E. Drilled public-supply artesian well in sandstone of Cambrian age, diam 10 in, reported depth 305 ft, cased to 39. MP, top of pump base, 1.0 ft above lsd. Measured monthly. All plotted.

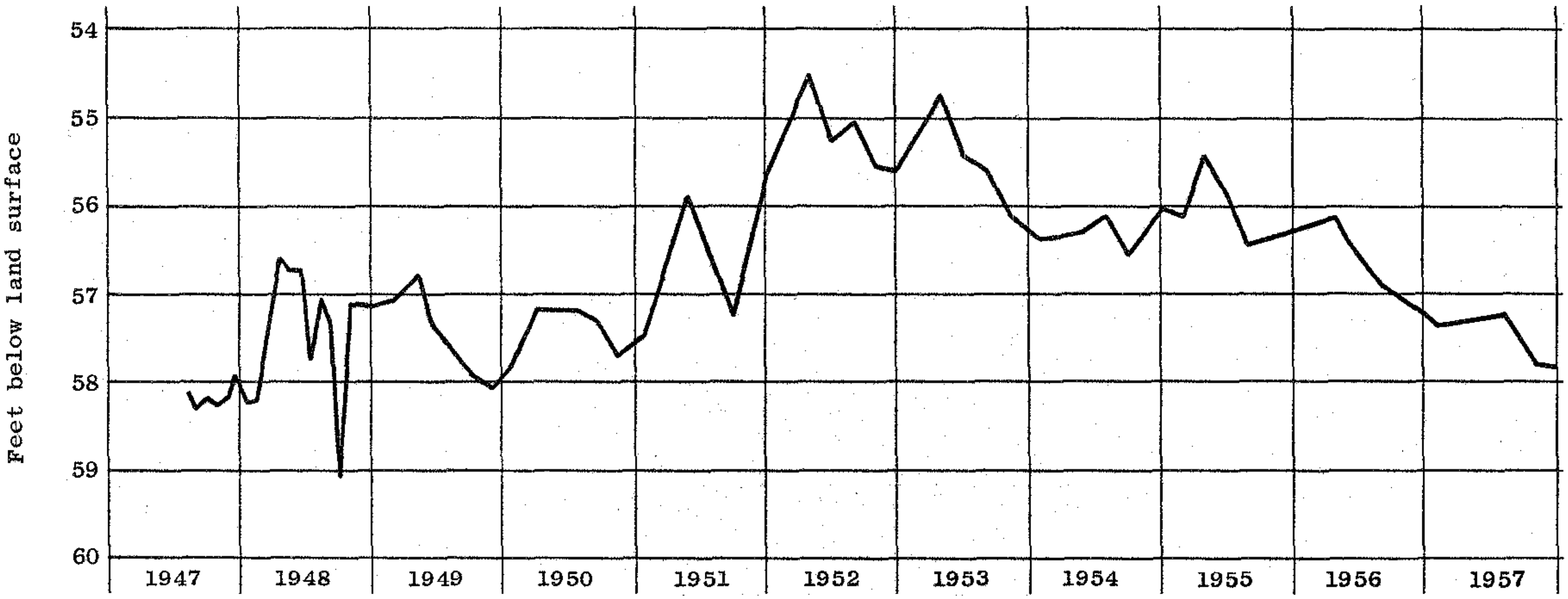

Figure 126.--Hydrograph of well Ro-2/12/2-3.

Rock Co. School for the Blind. Janesville. SW¼NE¼ sec. 2, T. 2 N., R. 12 E. Drilled unused artesian well in sandstone of Cambrian age and St. Peter sandstone, diam 10 in, reported depth 470 ft, cased to 113. Lsd, 824 ft above msl. MP, ¼-in hole in casing, 2.00 ft above lsd. Measured bimonthly. All plotted.

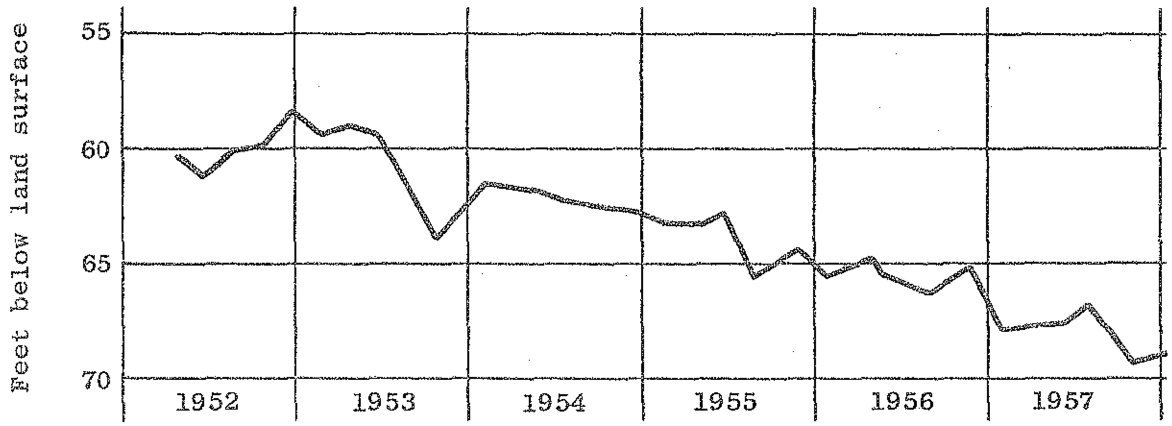

Figure 127.--Hydrograph of well Ro-4/13/27-8.

Rock Co. Village of Milton. SE¼SE¼ sec. 27, T. 4 N., R. 13 E. Drilled public-supply artesian well in sandstone of Cambrian age, diam 12 in, reported depth 722 ft, cased to 276. Lsd, 877 ft above msl. MP, hole in pump base, 1.0 ft above lsd. Measured bi-monthly. All plotted.

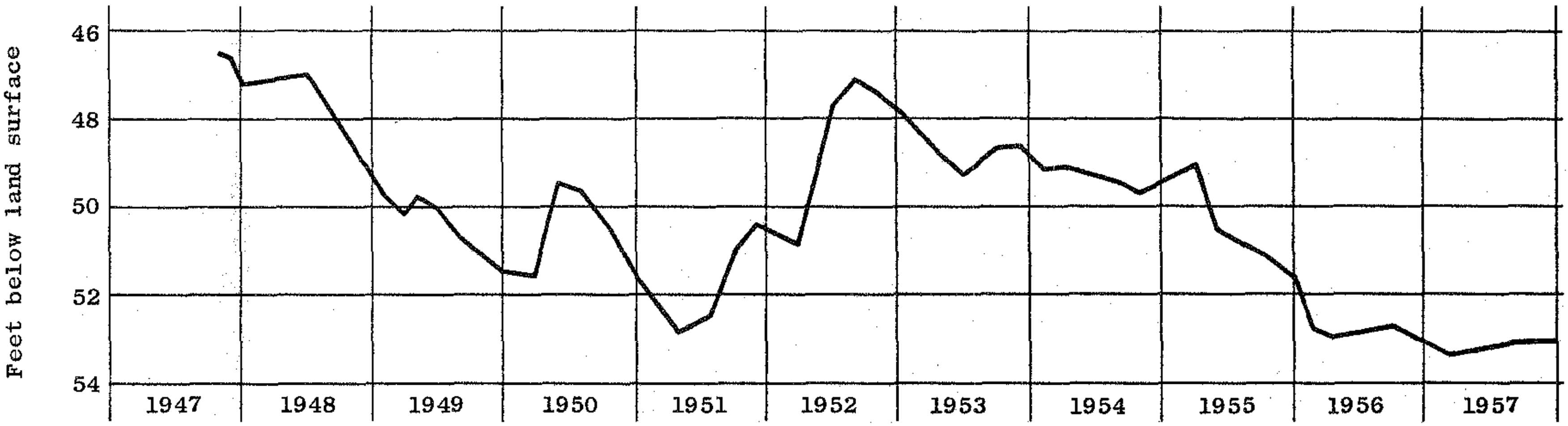

Figure 128.--Hydrograph of well SC-28/19W/31-2.

St. Croix Co. Casey Estate. SW¼NE¼ sec. 31, T. 28 N., R. 19 W. Drilled unused water-table well in Prairie du Chien group, diam 5 in. Lsd, 835 ft above msl. MP, pump base, 0.5 ft above lsd. Measured bi-monthly. All plotted.

Figure 129.--Hydrograph of well Sk-10/6/3-1.

Sauk Co. Badger Ordnance Works. SW$\frac{1}{4}$SE$\frac{1}{4}$ sec. 3, T. 10 N., R. 6 E. Drilled unused artesian well in sandstone of Cambrian age, diam 16 in, depth 426 ft, cased to 203. Lsd, 917 ft above msl. MP, top of casing, 1.43 ft above lsd. Recording gage. Lowest monthly plotted.

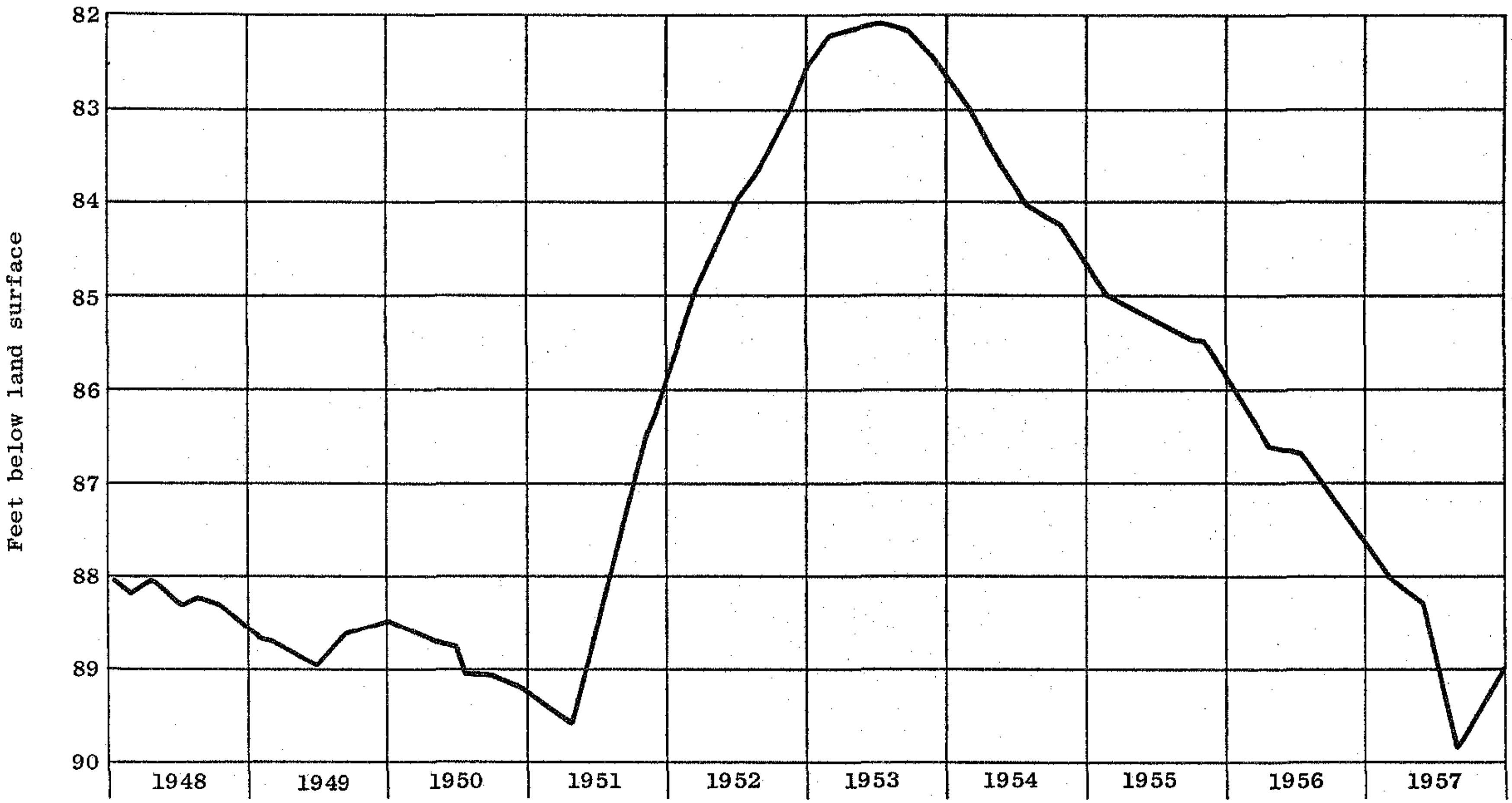

Figure 130.--Hydrograph of well Sk-10/6/15-11.

Sauk Co. Wilbur S. Grant. SW¼NE¼ sec. 15, T. 10 N., R. 6 E. Drilled domestic and stock artesian well in sandstone of Cambrian age, diam 6 in, reported depth 625 ft, cased to 390. Lsd, 859 ft above msl. MP, breather hole in cap on casing, 4.0 ft below lsd. Measured bi-monthly. All plotted.

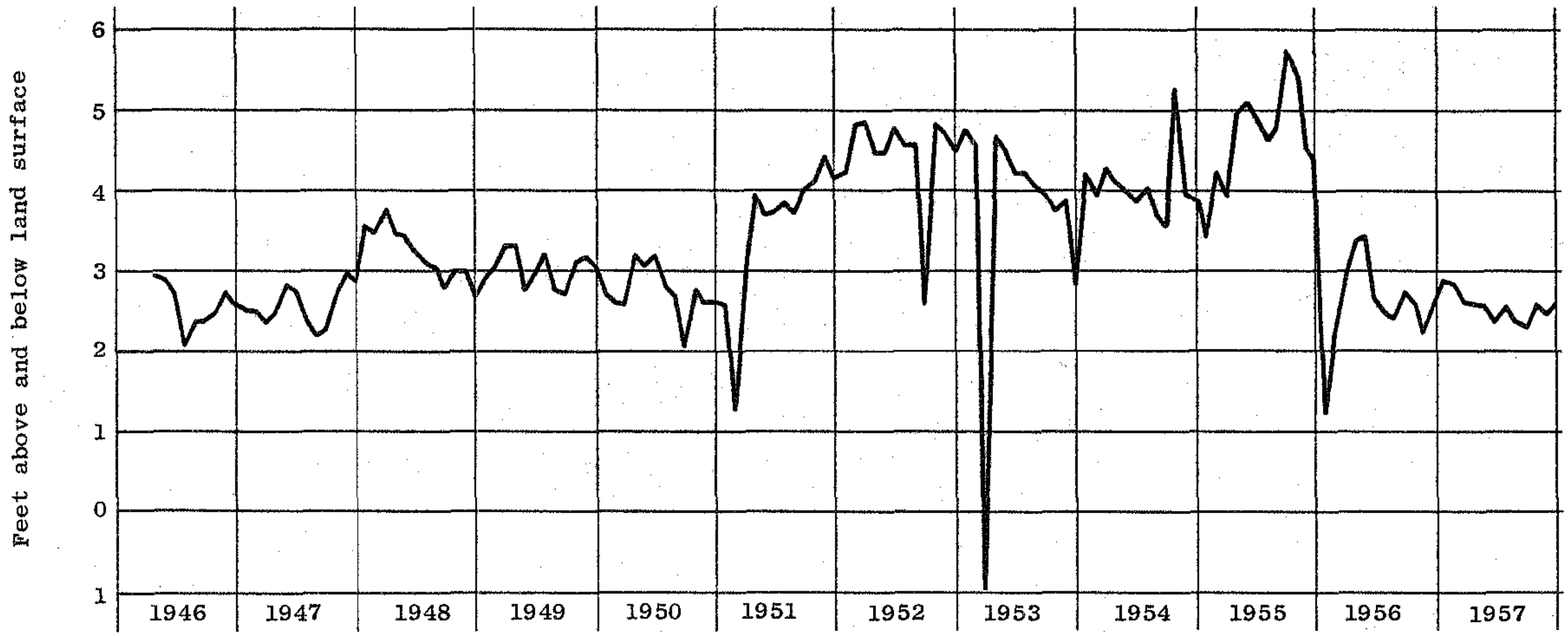

Figure 131.--Hydrograph of well Sk-11/6/1-6.

Sauk Co. A. W. Rohn. Baraboo Iron Works. SE$\frac{1}{4}$SW$\frac{1}{4}$ sec. 1, T. 11 N., R. 6 E. Drilled unused artesian well in sandstone of Cambrian age, diam 5 to 4 in, depth 318 ft, cased to 266. Lsd, 819 ft above msl. MP, top of casing, 5.00 ft above lsd. Measured weekly. Lowest monthly plotted.

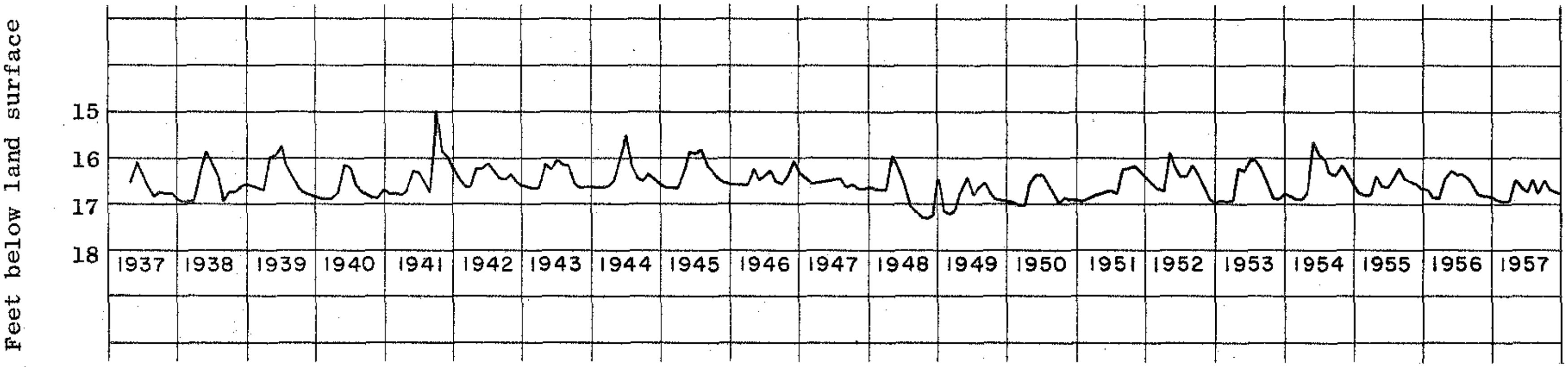

Figure 132.--Hydrograph of well Sw-41/9W/28-7.

Sawyer Co. Wisconsin Conservation Department. NE¼SE¼ sec. 28, T. 41 N., R. 9 W. Dug observation water-table well in gravel of Pleistocene age, diam 8 in, depth 25 ft, cased to 25. Lsd, 1,190 ft above msl. MP, pointer on Kinnison float gage, 4.58 ft above lsd. Measured weekly. Lowest monthly plotted. Measured daily before January 1945.

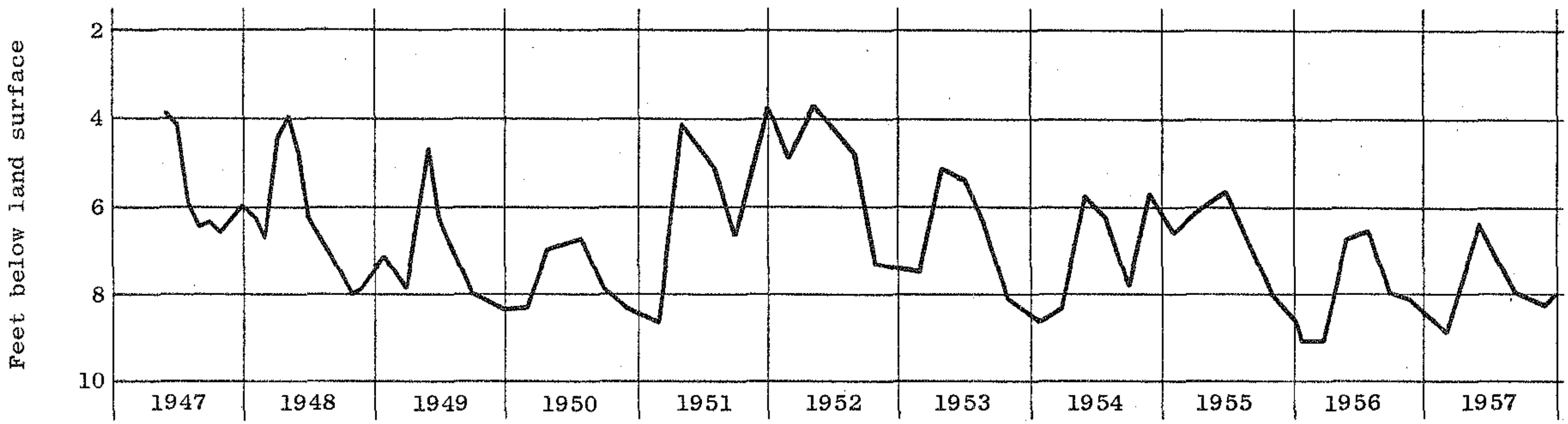

Figure 133.--Hydrograph of well Sh-25/17/28-4.

Shawano Co. John Short. NE¼SW¼ sec. 28, T. 25 N., R. 17 E. Drilled unused water-table well in Prairie du Chien group, diam 4 in, reported depth 50 ft. MP, top of casing, 2.0 ft above lsd. Measured bi-monthly. All plotted.

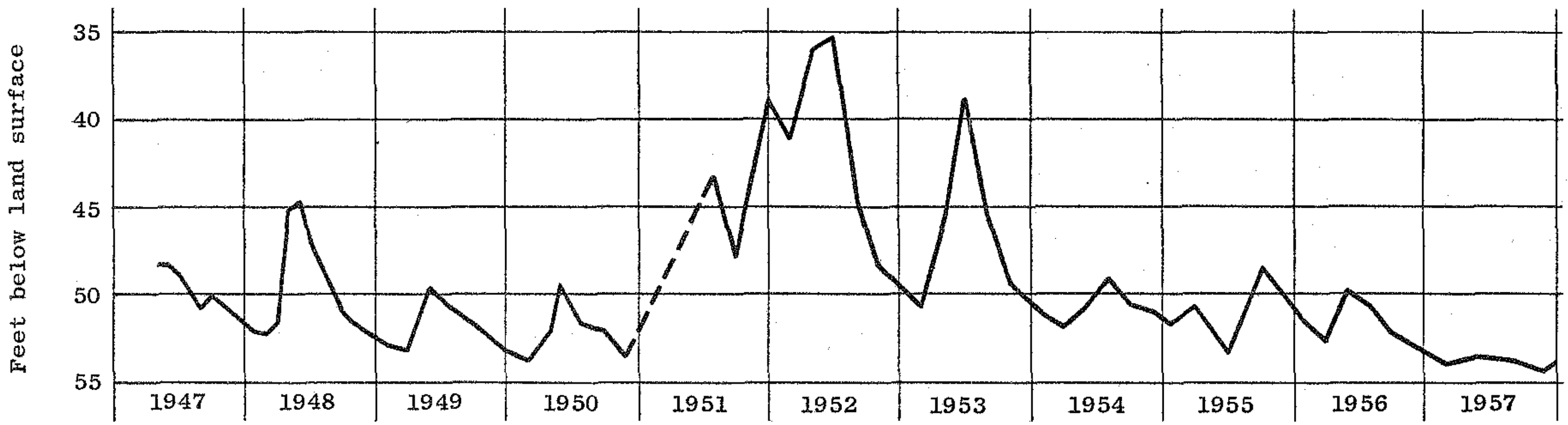

Figure 134.--Hydrograph of well Sh-26/16/2-2.

Shawano Co. Schilling Bros. SE¼NE¼ sec. 2, T. 26 N., R. 16 E. Drilled unused water-table well in Prairie du Chien group, diam 4 in, depth 85 ft. Lsd, 999 ft above msl. MP, pump base, 0.5 ft above lsd. Measured bi-monthly. All plotted.

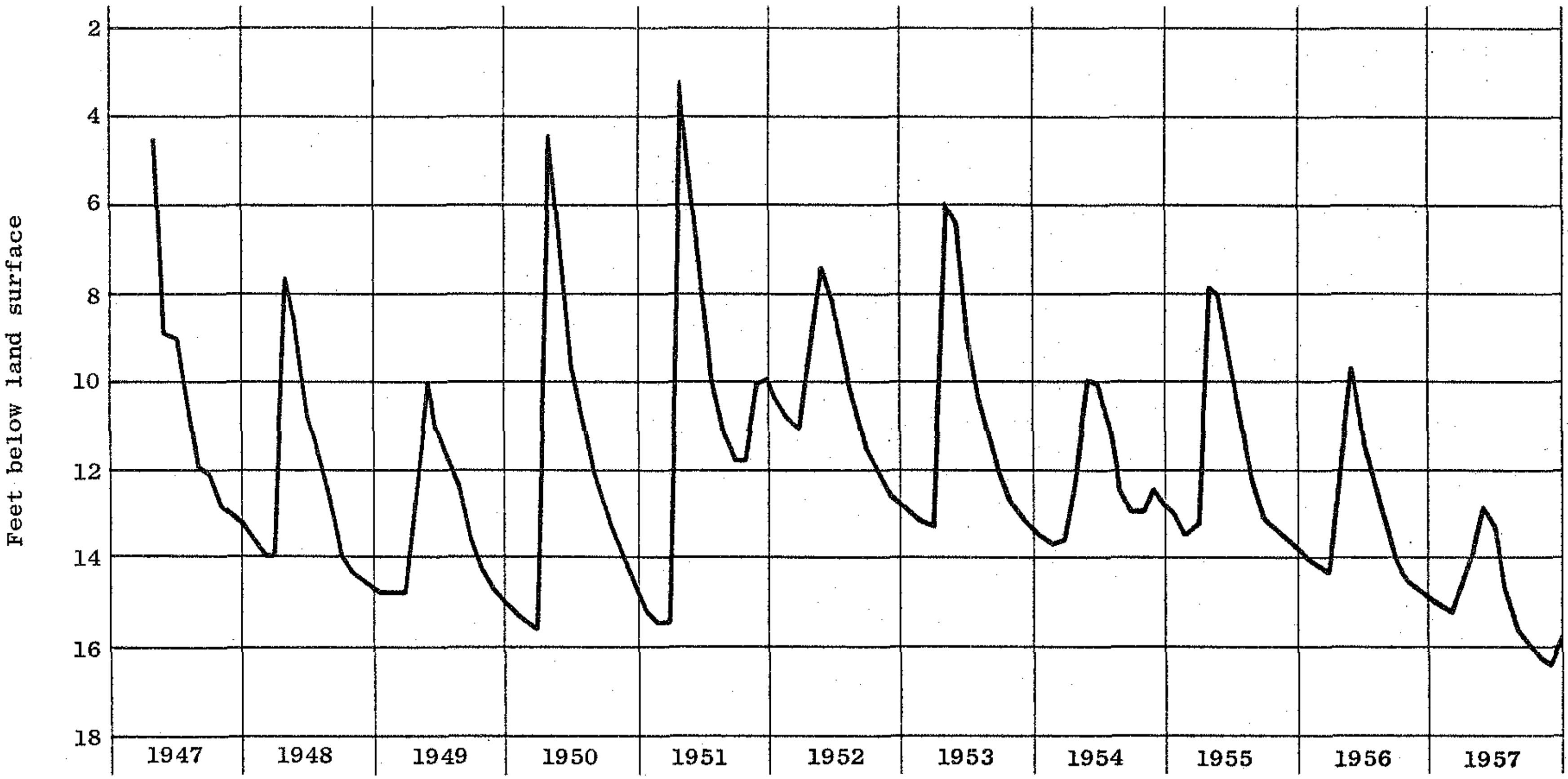

Figure 135.--Hydrograph of well Sh-26/16/2-3.

Shawano Co. George Martin. NE$\frac{1}{4}$NW$\frac{1}{4}$ sec. 2, T. 26 N., R. 16 E. Drilled unused water-table well in Prairie du Chien group, diam 4 in, depth 30 ft. Lsd, 957 ft above msl. MP, top of casing, 1.0 ft above lsd. Recording gage. Lowest monthly plotted. Measured monthly before May 1949.

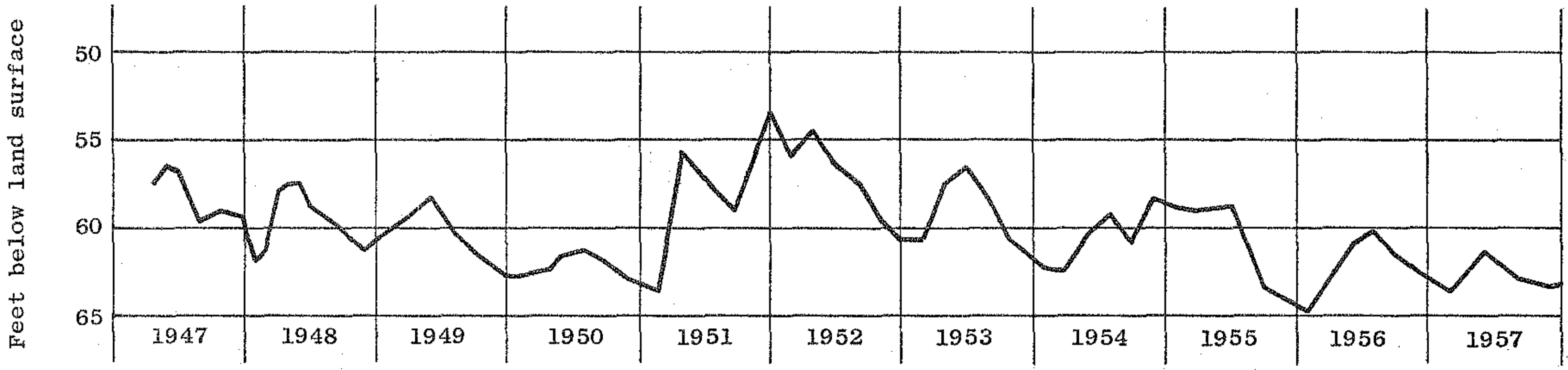

Figure 136.--Hydrograph of well Sh-26/18/30-1.

Shawano Co. Harry Sievert. NW¼NW¼ sec. 30, T. 26 N., R. 18 E. Drilled unused water-table well in limestone, diam 6 in, depth 132 ft. Lsd, 917 ft above msl. MP, hole in pump base, 1.00 ft above lsd. Measured bi-monthly. All plotted.

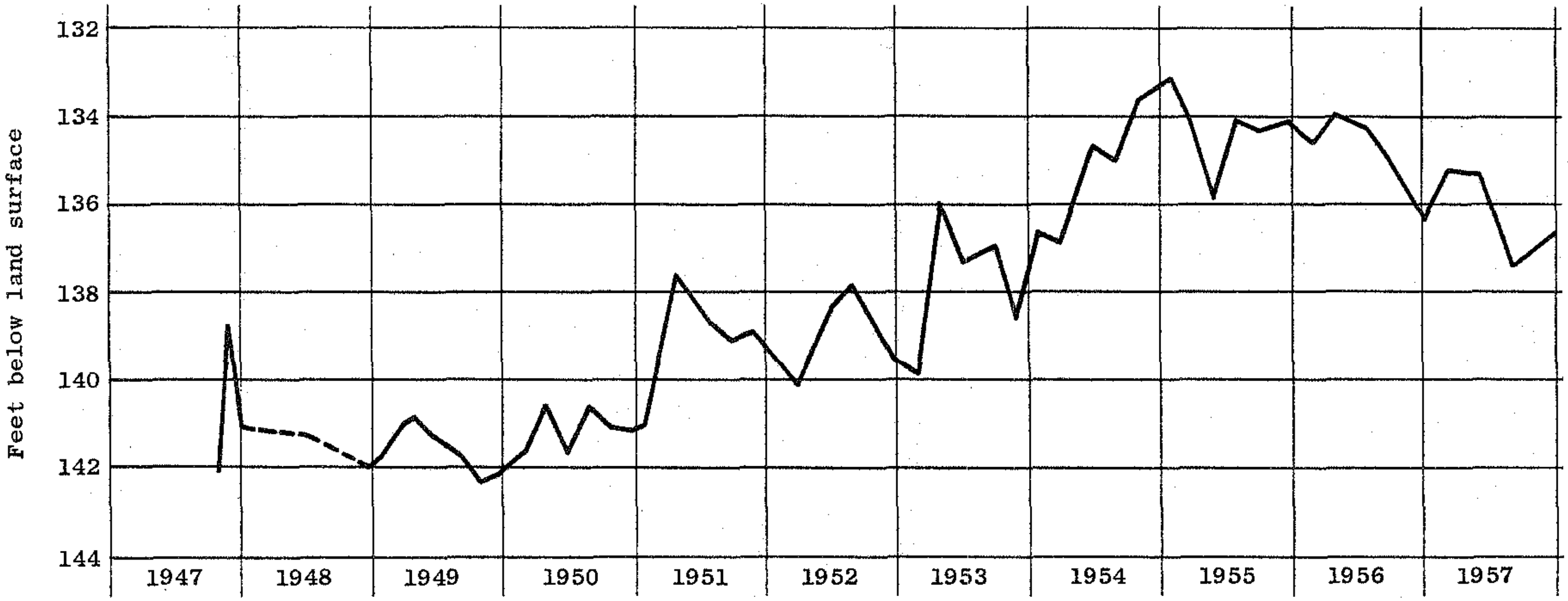

Figure 137.--Hydrograph of well Tr-19/8W/35-1.

Trempealeau Co. Mrs. William Davidson. SW¼SW¼ sec. 35, T. 19 N., R. 8 W. Drilled unused water-table well in sandstone of Cambrian age, diam 6 in. MP, top of casing, 1.00 ft above lsd. Measured bi-monthly. All plotted.

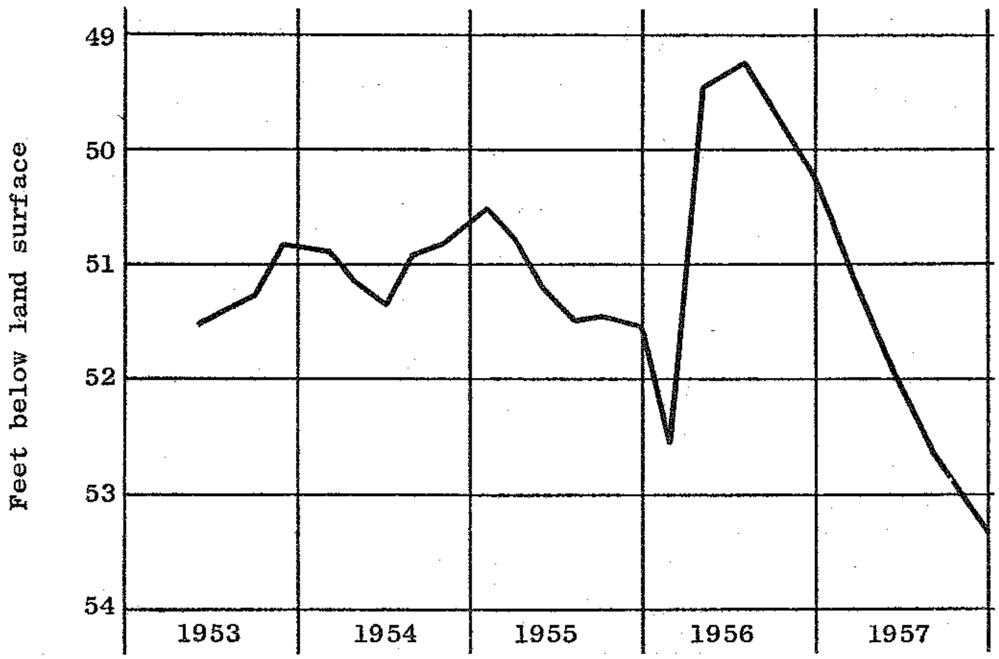

Figure 138A.--Hydrograph of well Tr-19/9W/33-9.

Trempealeau Co. Village of Centerville. SE$\frac{1}{4}$SE$\frac{1}{4}$ sec. 33, T. 19 N., R. 9 W. Drilled public-supply water-table well in drift of Pleistocene age, diam 6 in, reported depth 71 ft, cased to 66, screened 66-71. MP, top of breather pipe, at lsd. Measured bi-monthly. All plotted.

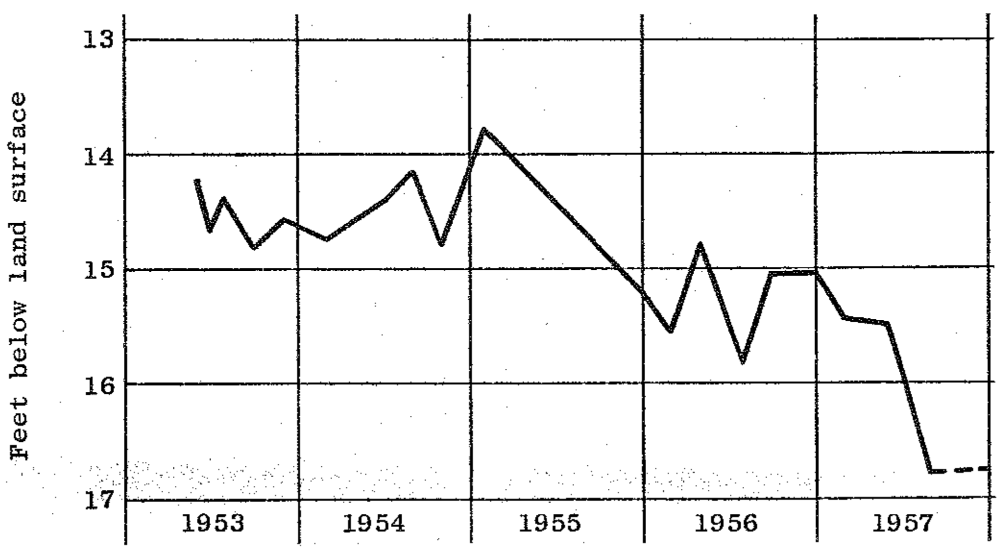

Figure 138B.--Hydrograph of well Tr-24/9W/9-4.

Trempealeau Co. Village of Eleva. NE$\frac{1}{4}$NE$\frac{1}{4}$ sec. 9, T. 24 N., R. 9 W. Drilled public-supply artesian well in sandstone of Cambrian age, diam 10 in, reported depth 203 ft, cased to 108. Lsd, 872 ft above msl. MP, hole in pump base, 2.0 ft above lsd. Measured bi-monthly. All plotted.

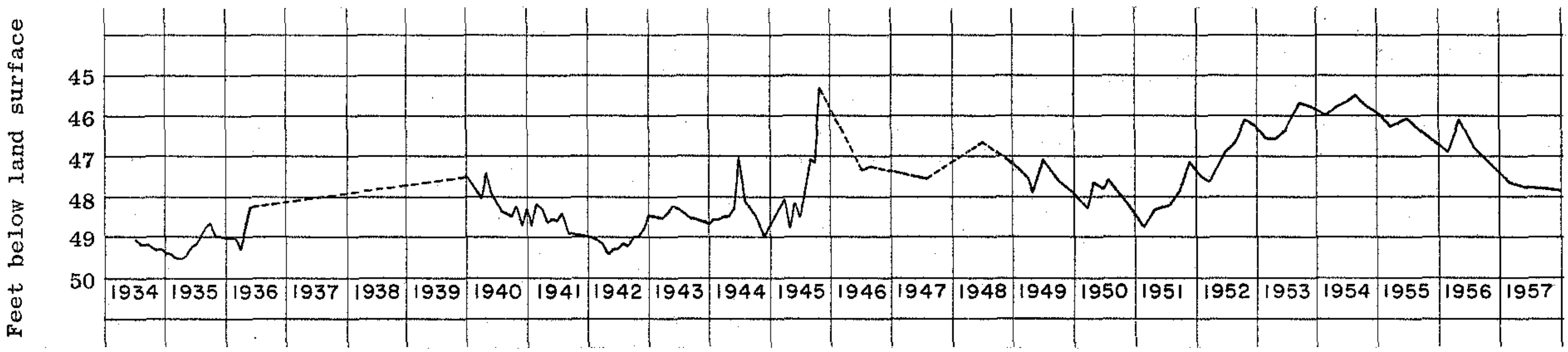

Figure 139.--Hydrograph of well Ve-14/7W/14-9.

Vernon Co. Ferdinand Lenser. NW¼NE¼ sec. 14, T. 14 N., R. 7 W. Dug unused artesian well in sandstone of Cambrian age, diam 48 to 30 in, depth 52 ft, curbed to 52. Lsd, 940 ft above msl. MP, top of plank cover, 1.6 ft above lsd. Measured bi-monthly. All plotted.

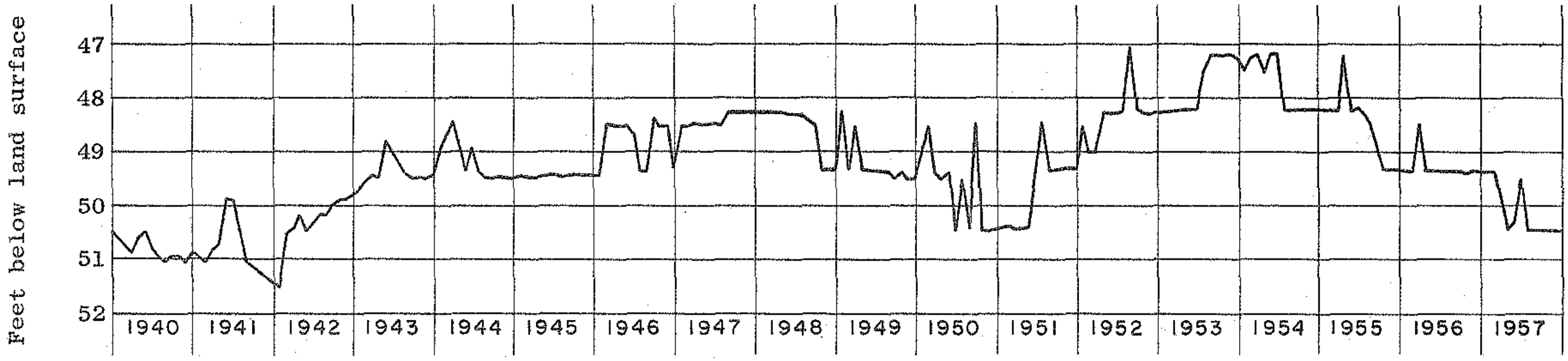

Figure 140.--Hydrograph of well Ve-14/7W/26-8.

Vernon Co. M. H. Willenberg. SW$\frac{1}{4}$NE$\frac{1}{4}$ sec. 26, T. 14 N., R. 7 W. Dug unused water-table well in alluvium of Quaternary age, diam 30 in, depth 54 ft, curbed to 54. Lsd, 710 ft above msl. MP, edge of well cover, 0.5 ft above lsd. Measured monthly. All plotted.

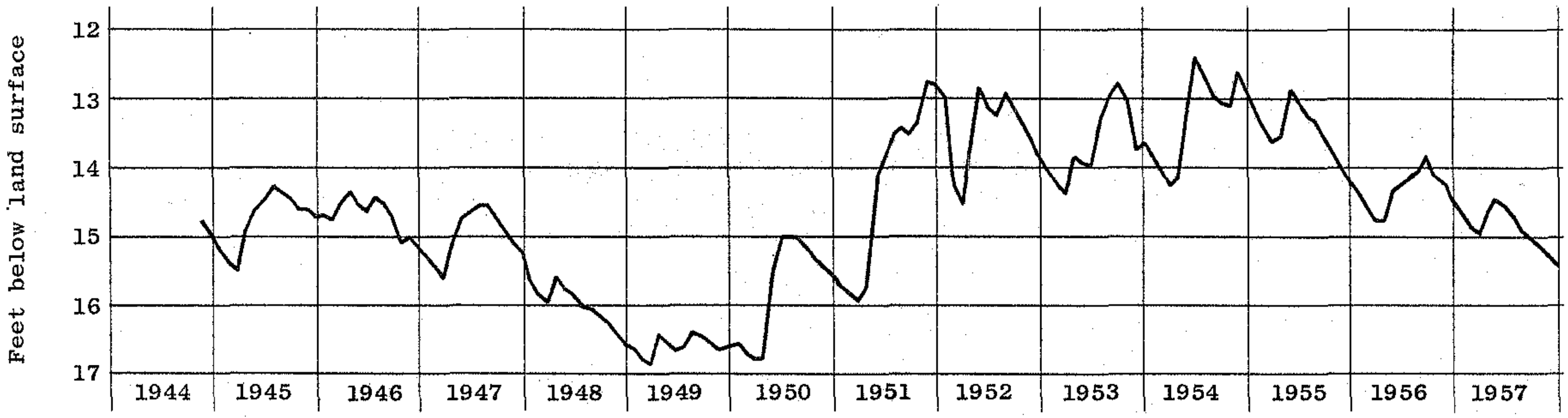

Figure 141.--Hydrograph of well Vi-40/10/10-21.

Vilas Co. U. S. Geol. Survey. NE¼NE¼ sec. 10, T. 40 N., R. 10 E. Driven observation water-table well in sand of Pleistocene age, diam 1¼ in, depth 27 ft, well point 25-27. MP, top of casing, 1.00 ft above lsd. Measured weekly. Lowest monthly plotted.

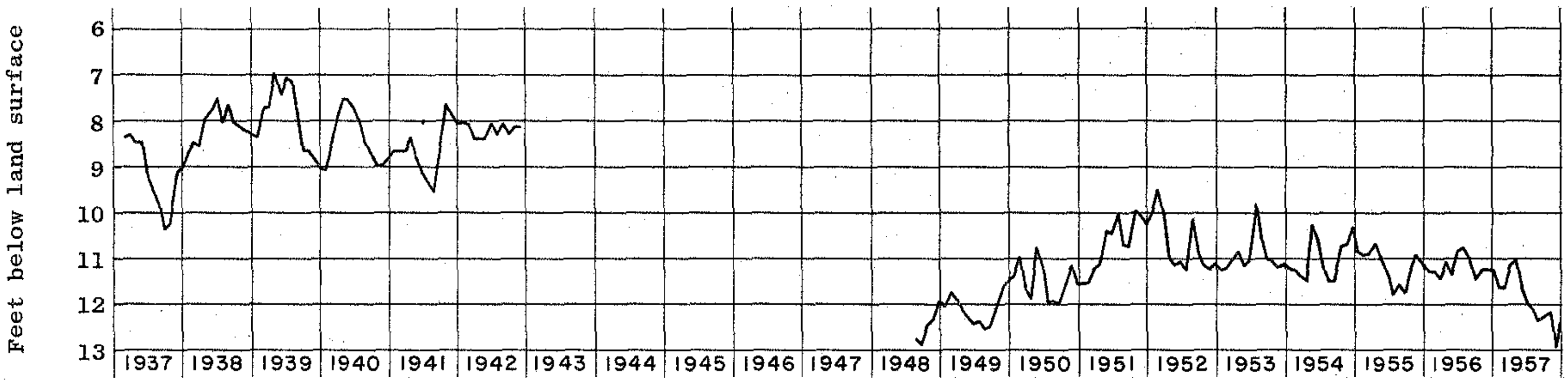

Figure 142.--Hydrograph of well Vi-41/10/9-3.

Vilas Co. Wisconsin Conservation Department. NE$\frac{1}{4}$NW$\frac{1}{4}$ sec. 9, T. 41 N., R. 10 E. Driven observation water-table well in sand of Pleistocene age, diam 2 in, depth 20 ft, cased to 18, well point 18-20. Lsd, 1,658 ft above msl. MP, top of casing, 2.0 ft above lsd. Measured weekly. Lowest monthly plotted.

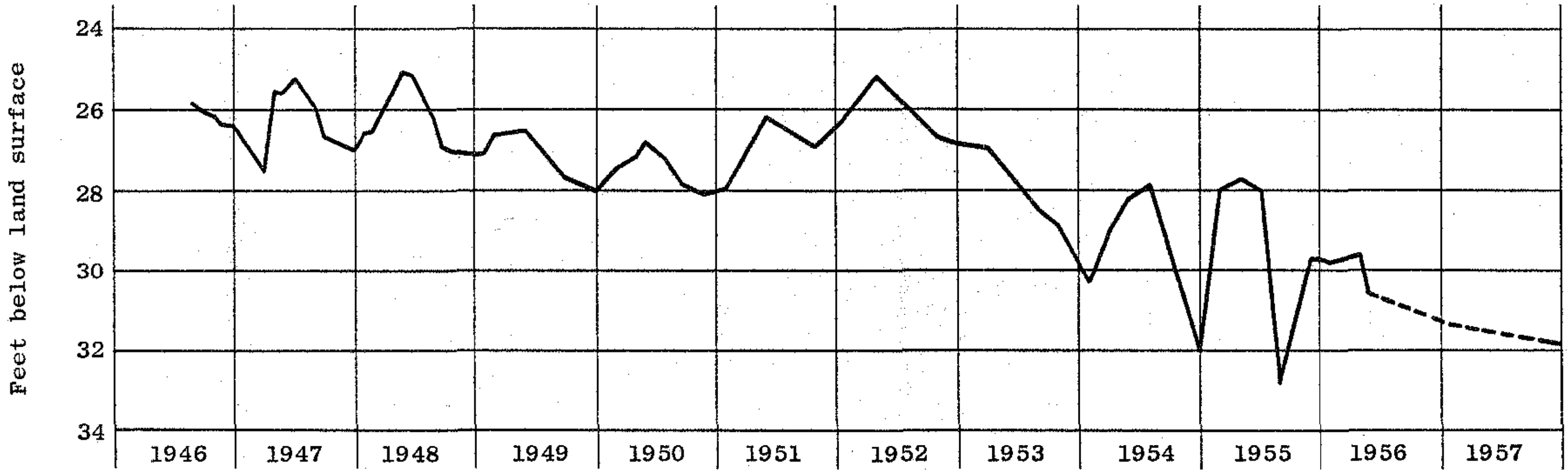

Figure 143.--Hydrograph of well Ww-1/18/35-1.

Walworth Co. Village of Genoa Junction. SE¼SE¼ sec. 35, T. 1 N., R. 18 E. Drilled public-supply artesian well in sandstone of Cambrian age and St. Peter sandstone, diam 10 in, reported depth 1,080 ft, cased to 690, 8 in liner 863-950. Lsd, 829 ft above msl. MP, flange over top of casing, 2.0 ft above lsd. Measured bi-monthly. All plotted.

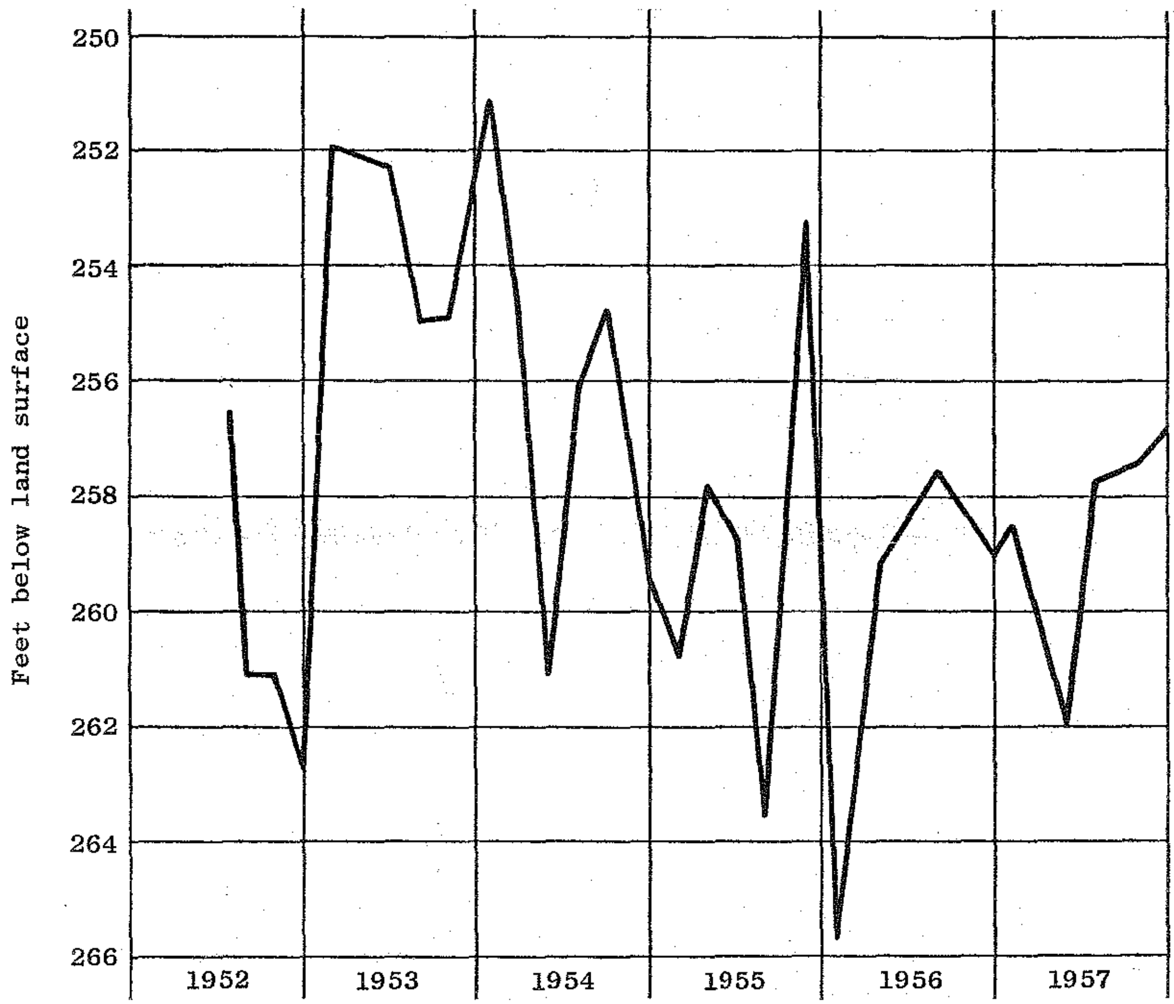

Figure 144.--Hydrograph of well Ww-2/17/4-24.

Walworth Co. Walworth County Farm and Home. NW¼SE¼ sec. 4, T. 2 N., R. 17 E. Drilled public-supply artesian well in sandstone of Cambrian age, diam 12 in, reported depth 1,702 ft, cased to 435. Lsd, 1,040 ft above msl. MP, south breather hole, 2.0 ft above lsd. Measured bi-monthly. All plotted.

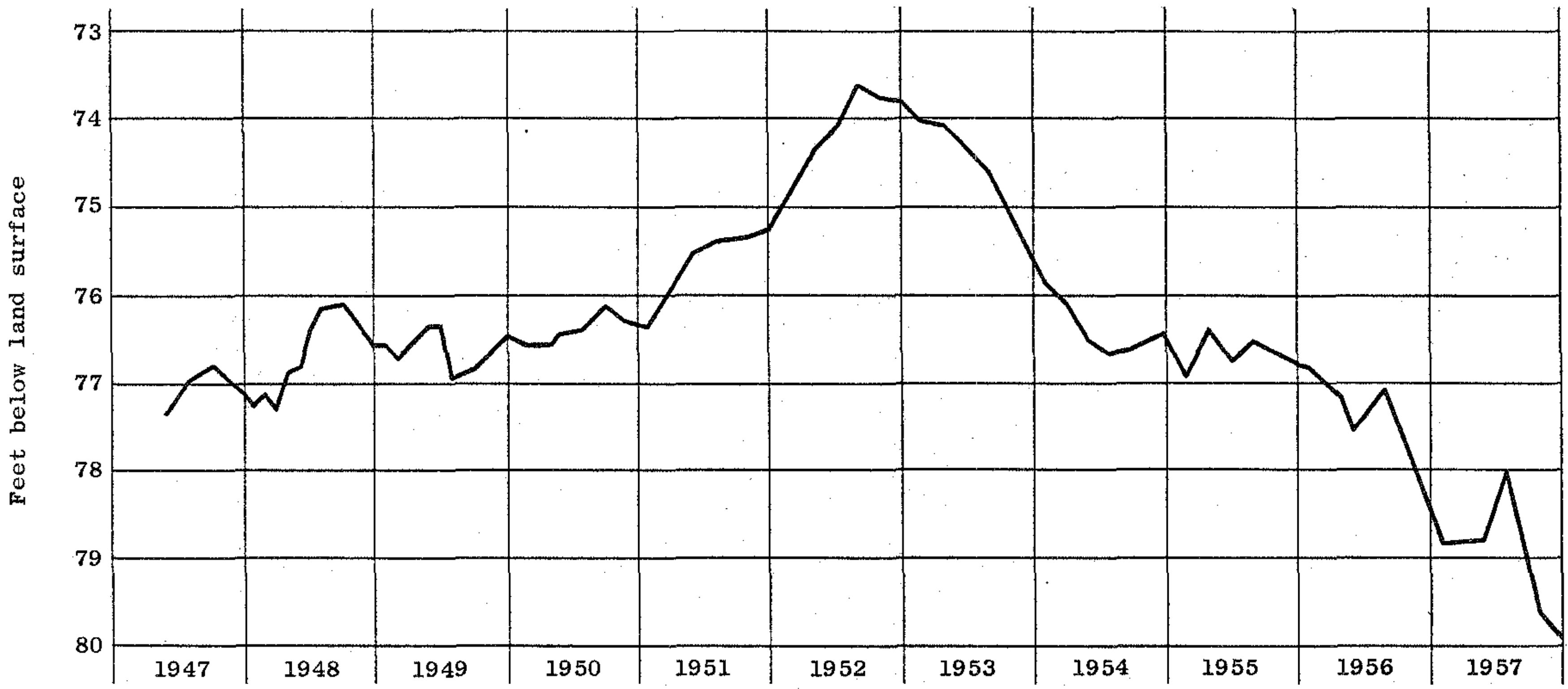

Figure 145.--Hydrograph of well Ww-3/15/33-9.

Walworth Co. Arthur and Roy Stewart. SW¼SW¼ sec. 33, T. 3 N., R. 15 E. Drilled stock artesian well in Galena dolomite, diam 6 in, reported depth 287 ft, cased to 287. MP, hole in pump base, 1.0 ft above lsd. Measured bi-monthly. All plotted.

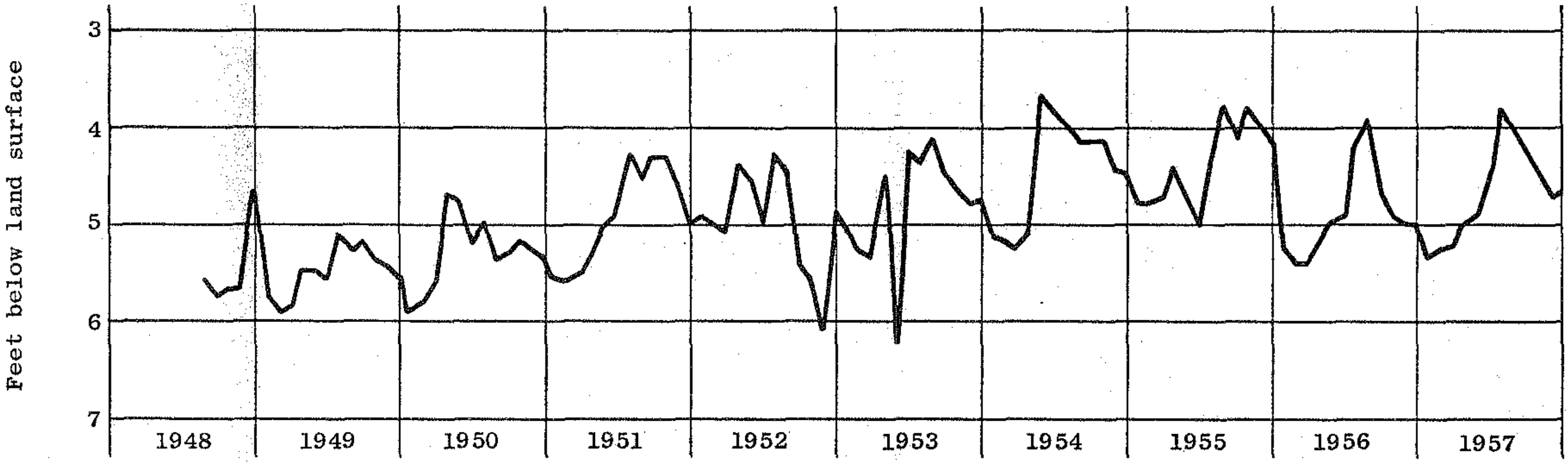

Figure 146.--Hydrograph of well Wb-39/12W/31-1.

Washburn Co. Wisconsin Conservation Dept. NE¼SW¼ sec. 31, T. 39 N., R. 12 W. Driven observation water-table well in sand of Pleistocene age, diam 1¼ in, depth 18 ft, well point 16-18. Lsd, 1,064 ft above msl. MP, top of casing, 1.70 ft above lsd. Measured weekly. Lowest monthly plotted.

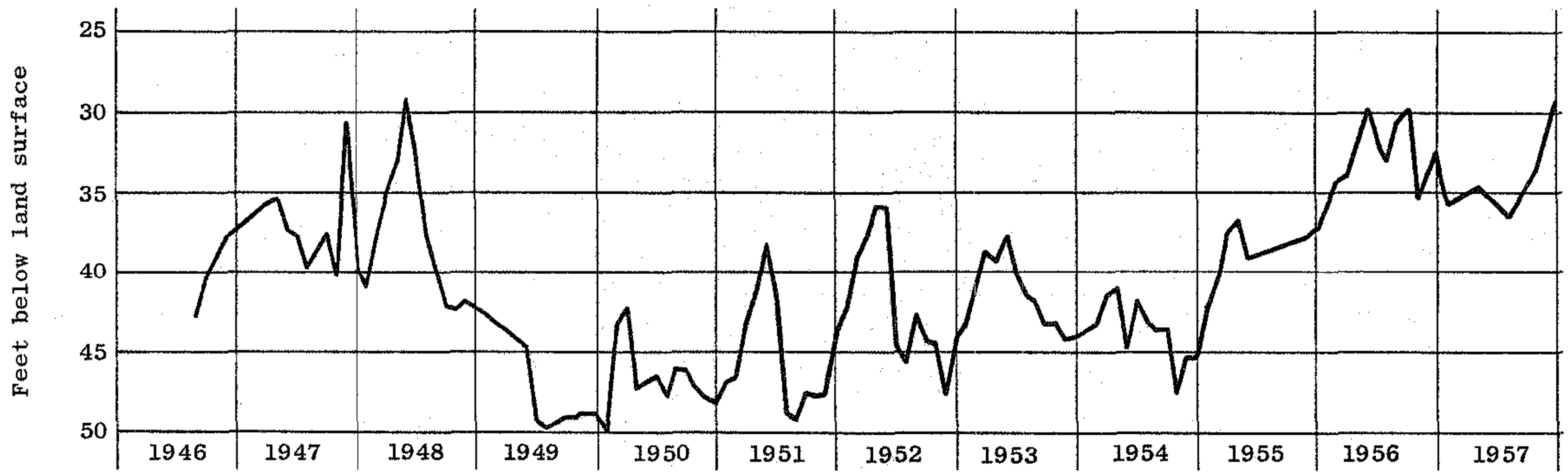

Figure 147.--Hydrograph of well Wn-10/18/20-2.

Washington Co. City of Hartford. SE¼NE¼ sec. 20, T. 10 N., R. 18 E. Drilled unused artesian well in Galena dolomite and Platteville formation, diam 16 in, depth 497 ft, cased to 284. Lsd, 980 ft above msl. MP, top of concrete, 1.0 ft above lsd. Measured monthly. All plotted. Recording gage before October 1955. Measured monthly before July 1948.

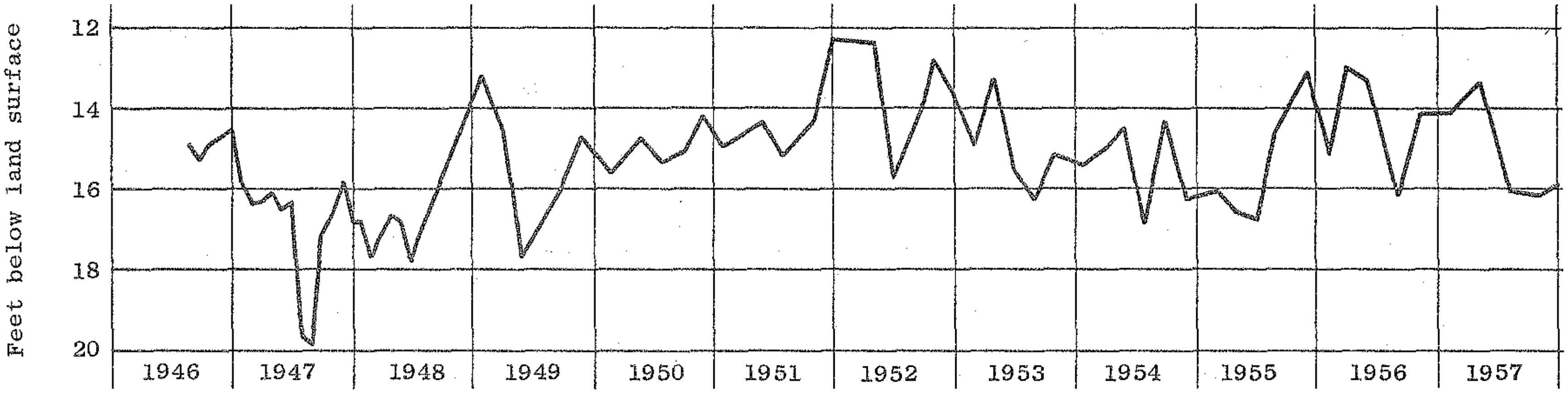

Figure 148.--Hydrograph of well Wn-11/19/11-3.

Washington Co. City of West Bend. City Hall. NE¼ sec. 11, T. 11 N., R. 19 E. Drilled unused artesian well in St. Peter sandstone, diam 8 in, reported depth 1,200 ft, cased to 75. Lsd, 920 ft above msl. MP, top of casing, 3.00 ft below lsd. Measured bi-monthly. All plotted. Recording gage before July 1948.

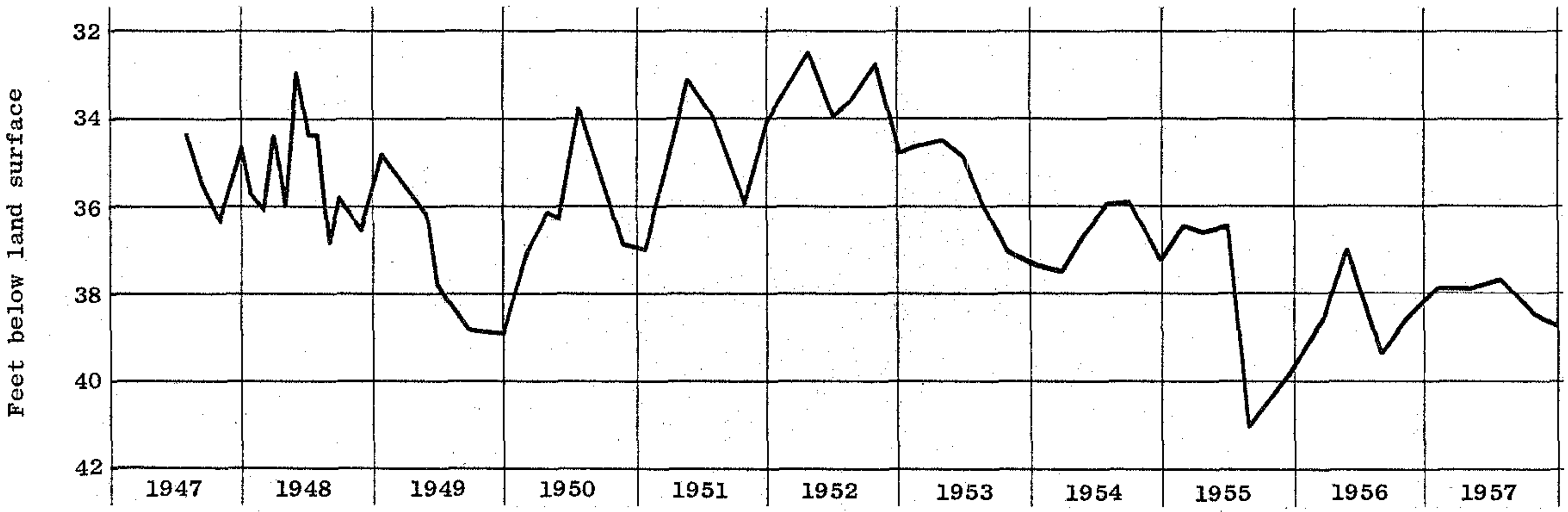

Figure 149.--Hydrograph of well Wk-5/18/19-34.

Waukesha Co. A. N. McGeoch Co. NW¼SW¼ sec. 19, T. 5 N., R. 18 E. Drilled domestic artesian well in St. Peter sandstone, diam 6 in, reported depth 618 ft, cased to 255. Lsd, 902 ft above msl. MP, hole in pump base, 7.0 ft below lsd. Measured bi-monthly. All plotted.

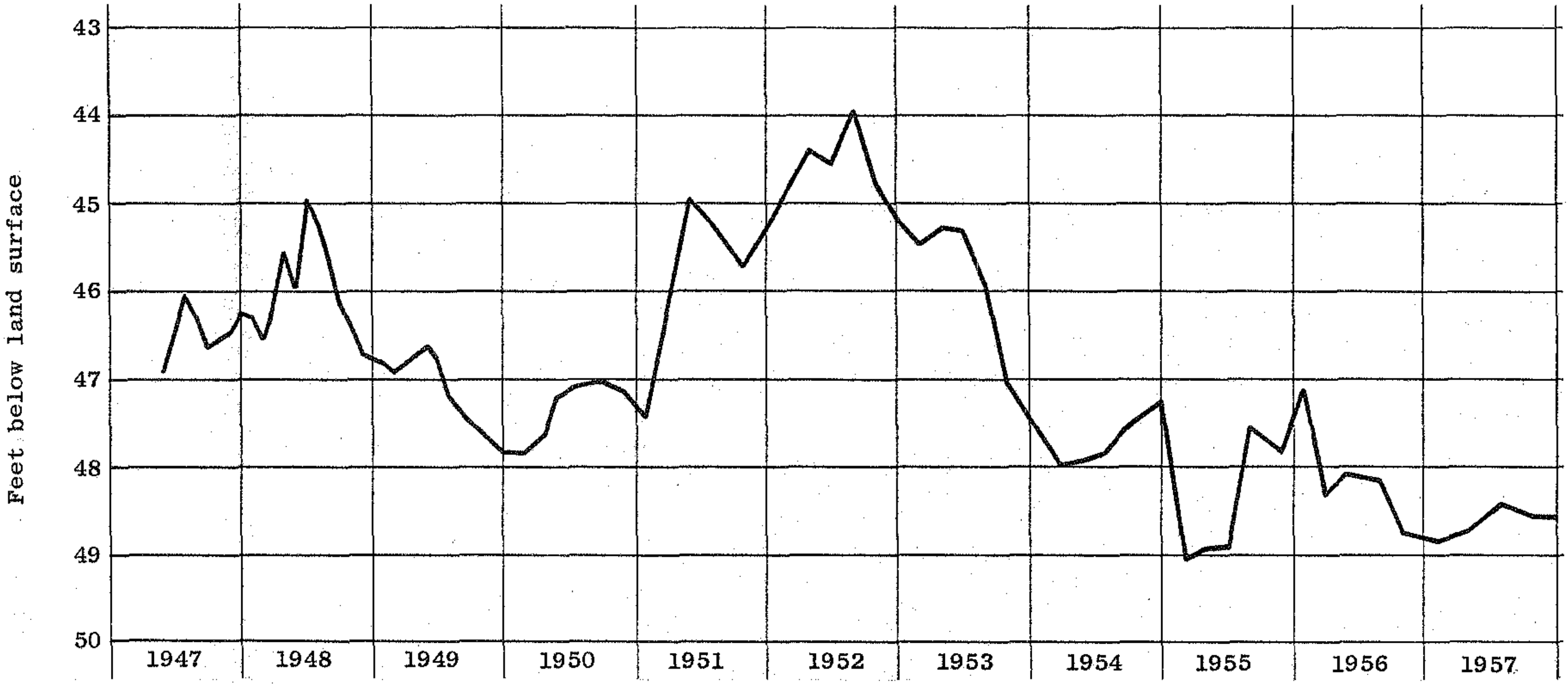

Figure 150.--Hydrograph of well Wk-5/18/23-32.

Waukesha Co. Western United Dairy Co. SE¼SE¼ sec. 23, T. 5 N., R. 18 E. Drilled unused artesian well in Maquoketa shale, diam 6 in, depth 144 ft, cased to 137. MP, top of casing, at lsd. Measured bi-monthly. All plotted.

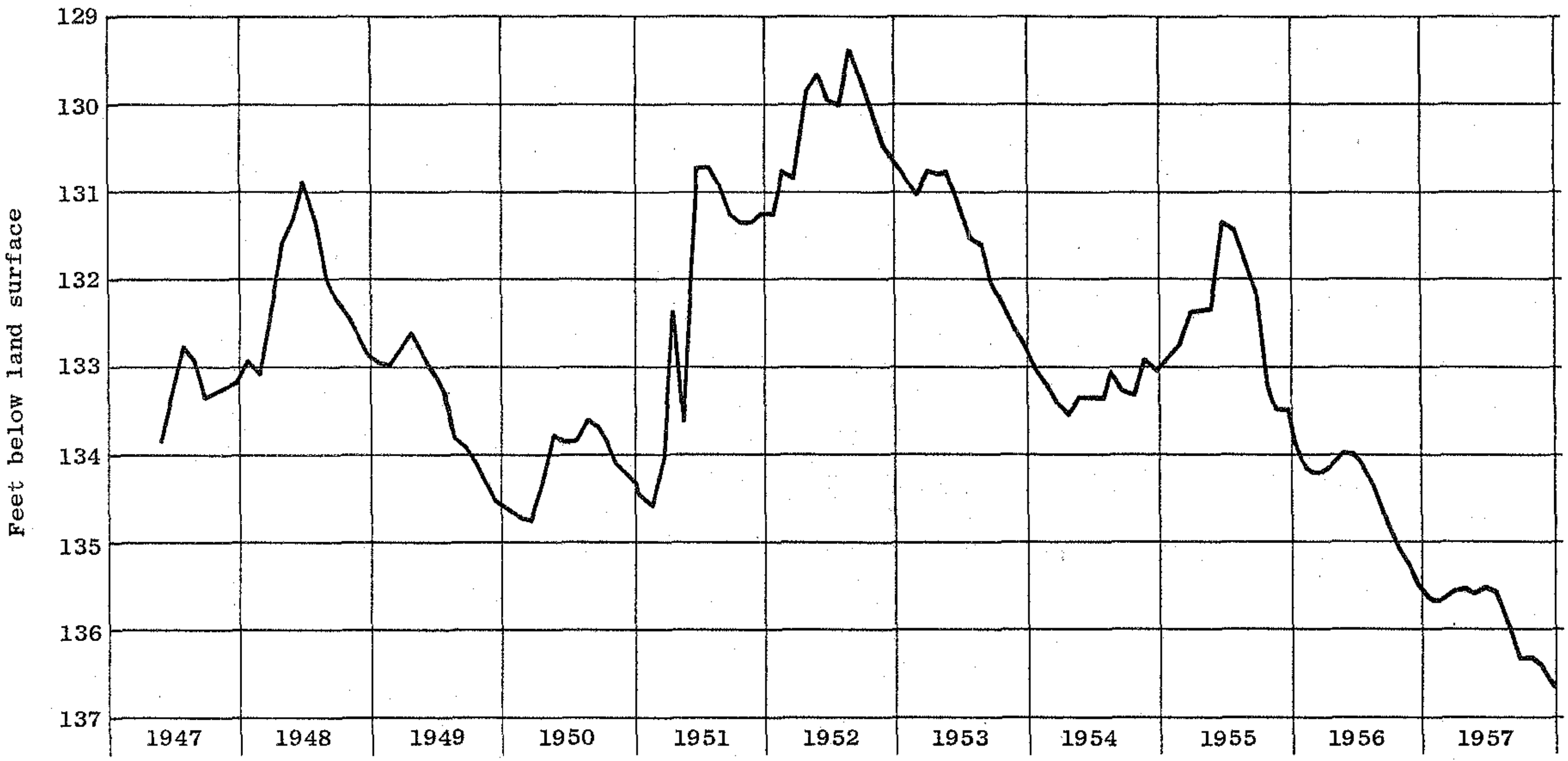

Figure 151.--Hydrograph of well Wk-5/19/2-31.

Waukesha Co. William M. Foss. NE$\frac{1}{4}$NW$\frac{1}{4}$ sec. 2, T. 5 N., R. 19 E. Drilled unused artesian well in Galena dolomite, diam 6 in, depth 508 ft, cased to 434. Lsd, 962 ft above msl. MP, top of casing, 1.00 ft above lsd. Recording gage. Lowest monthly plotted. Measured monthly before August 1948.

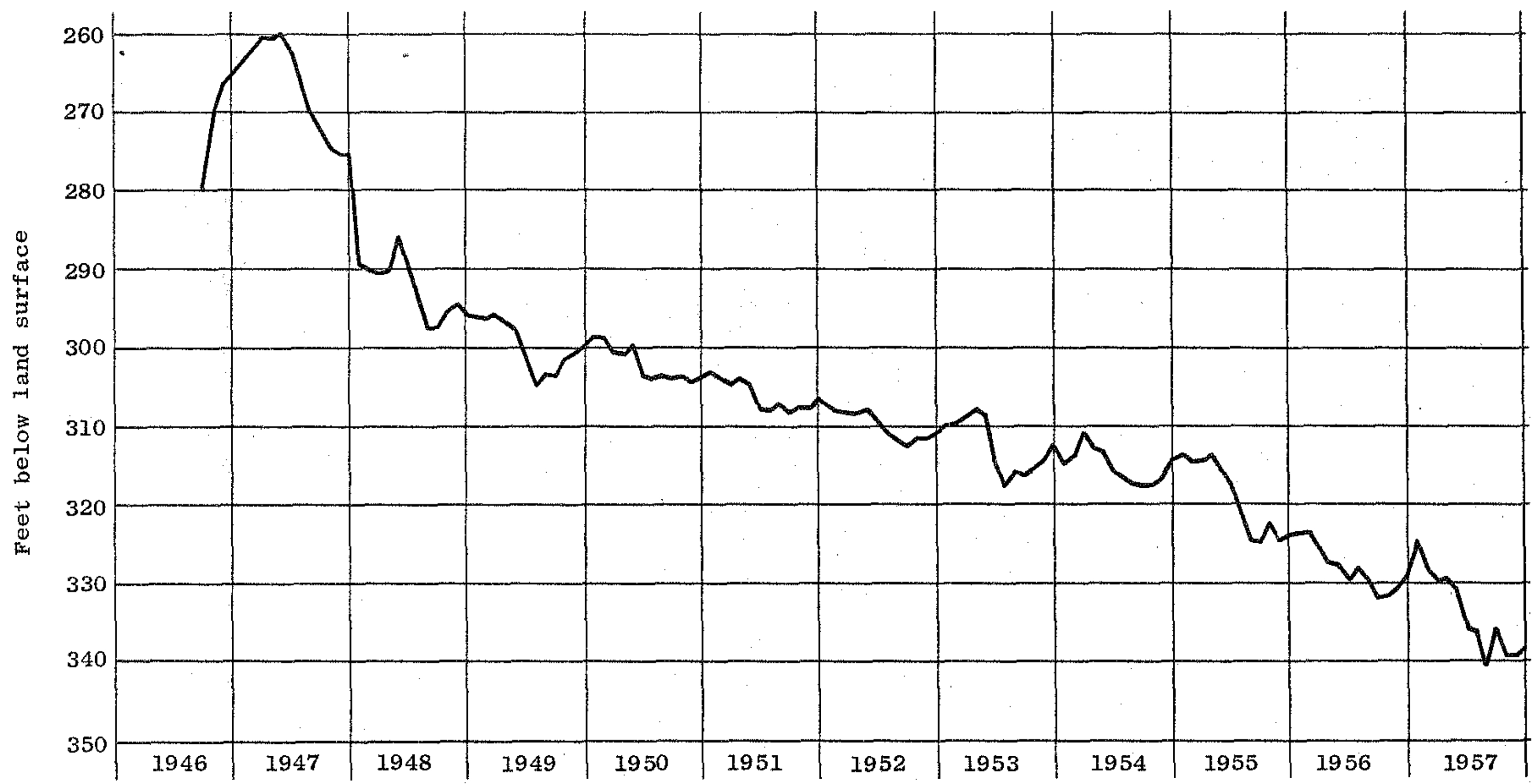

Figure 152.--Hydrograph of well Wk-6/19/2-14.

Waukesha Co. Veterans Administration Hospital. State Highway 59 and County Highway "Y", Waukesha. SE$\frac{1}{4}$NW$\frac{1}{4}$ sec. 2, T. 6 N., R. 19 E. Drilled unused artesian well in sandstone of Cambrian age and St. Peter sandstone, diam 8 in, reported depth 1,300 ft. Lsd, 875.03 ft above msl. MP, top of casing, at lsd. Recording gage. Lowest monthly plotted.

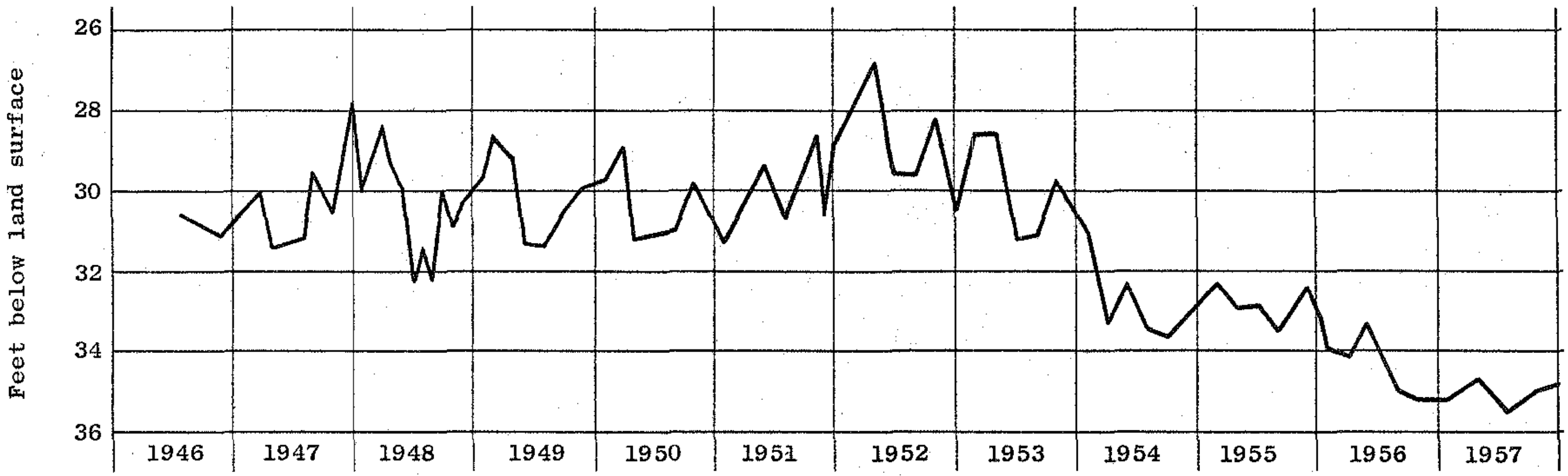

Figure 153.--Hydrograph of well Wk-7/17/5-20.

Waukesha Co. C. W. Aeppler. SW$\frac{1}{4}$NW$\frac{1}{4}$ sec. 5, T. 7 N., R. 17 E. Drilled irrigation artesian well in sandstone of Cambrian age and St. Peter sandstone, diam 10 in, reported depth 773 ft, cased to 187. Lsd, 873 ft above msl. MP, top of casing, 7.0 ft below lsd. Measured bi-monthly. All plotted.

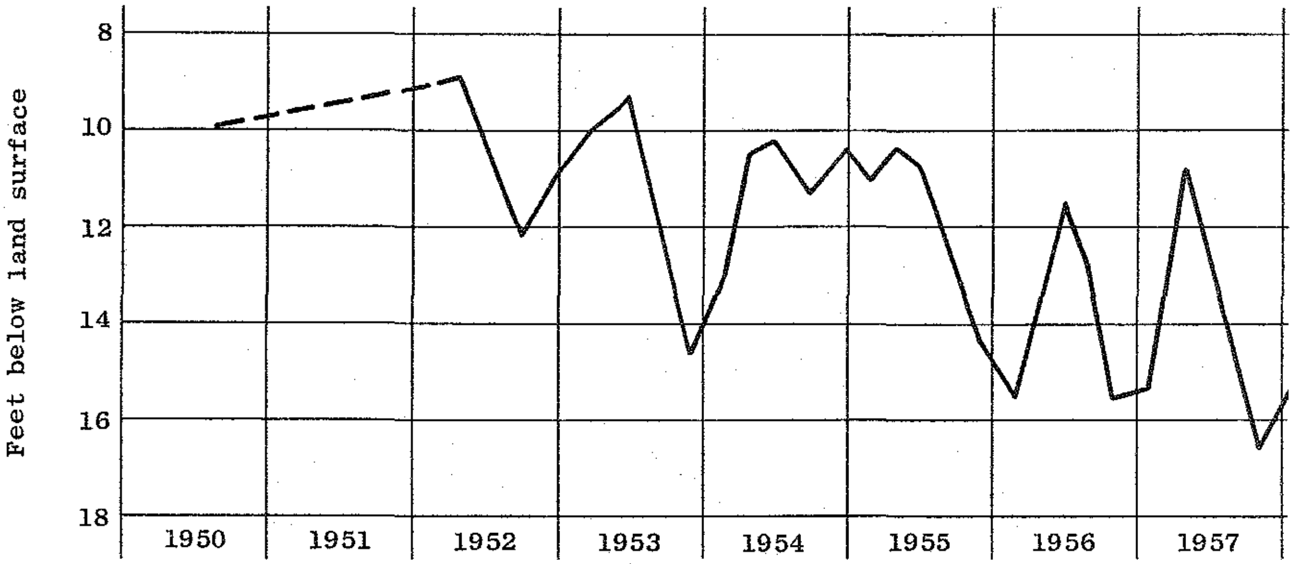

Figure 154A.--Hydrograph of well Wk-8/20/19-50.

Waukesha Co. Mr. Walsh. SW¼NE¼ sec. 19, T. 8 N., R. 20 E. Drilled domestic artesian well in Niagara dolomite, diam 6 in, reported depth 86 ft. Lsd, 878 ft above msl. MP, top of casing, 2.5 ft above lsd. Measured bimonthly. All plotted.

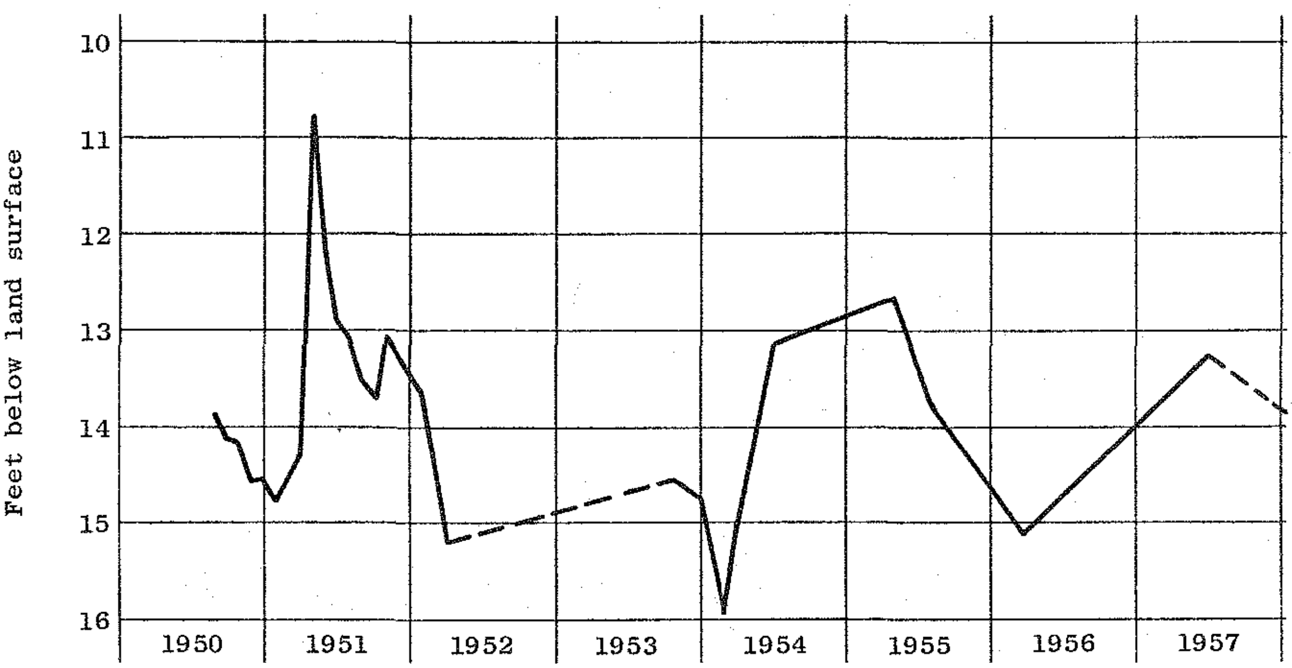

Figure 154B.--Hydrograph of well Wp-21/13/25-2.

Waupaca Co. Village of Fremont. NE¼SW¼ sec. 25, T. 21 N., R. 13 E. Drilled public-supply artesian well in sandstone of Cambrian age, diam 8 in, reported depth 205 ft, cased to 109. MP, edge of plug in cap, 1.00 ft above lsd. Measured weekly. Lowest monthly plotted.

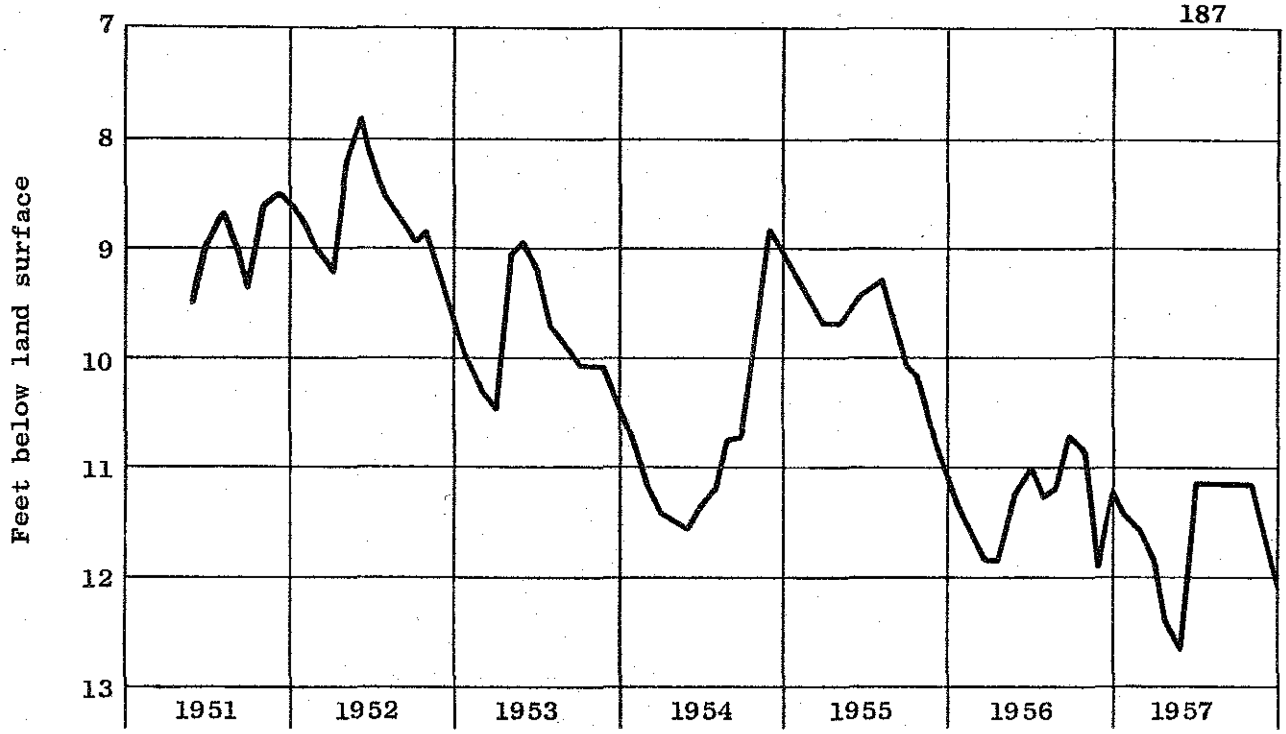

Figure 155A.--Hydrograph of well Ws-19/8/15-8.

Waushara Co. University of Wisconsin Experiment Farm, Hancock. NE¼NW¼ sec. 15, T. 19 N., R. 8 E. Jetted observation water-table well in sand and gravel of Pleistocene age, diam 4 in, depth 18 ft. Lsd, 1,080 ft above msl. MP, top of casing, 1.0 ft above lsd. Recording gage. Lowest monthly plotted.

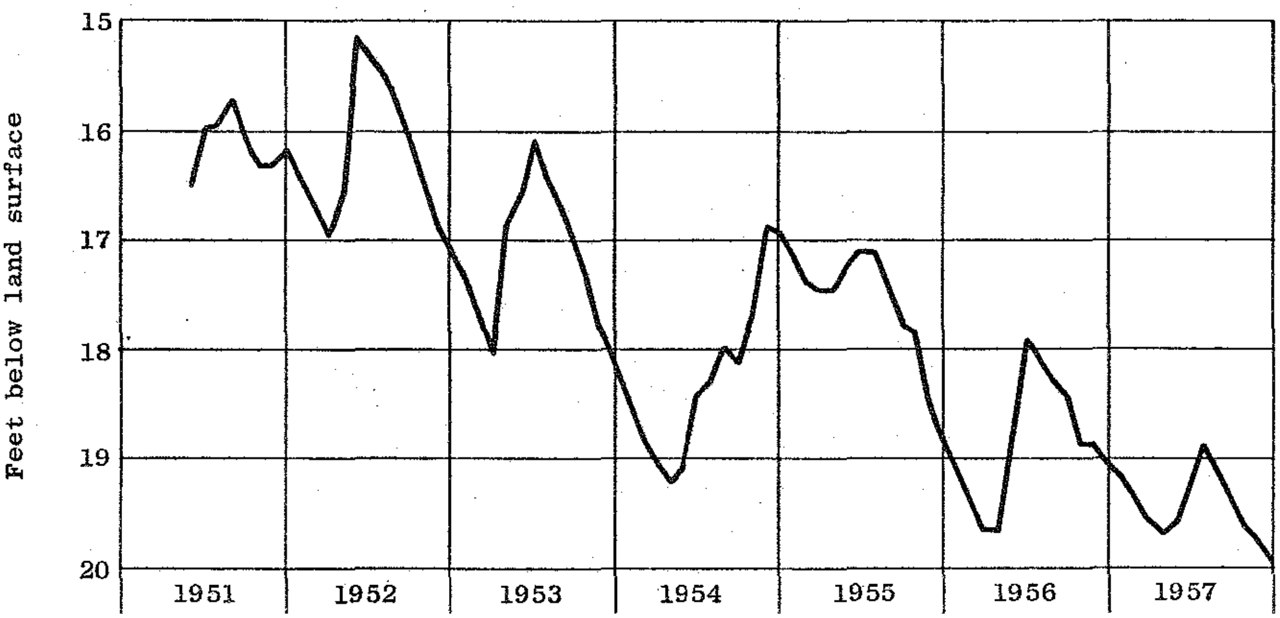

Figure 155B.--Hydrograph of well Ws-19/8/15-9.

Waushara Co. University of Wisconsin Experiment Farm. Hancock. NE¼NW¼ sec. 15, T. 19 N., R. 8 E. Jetted observation water-table well in sand and gravel of Pleistocene age, diam 4 in, depth 26 ft. Lsd, 1,090 ft above msl. MP, top of casing, 1.00 ft above lsd. Recording gage. Lowest monthly plotted.

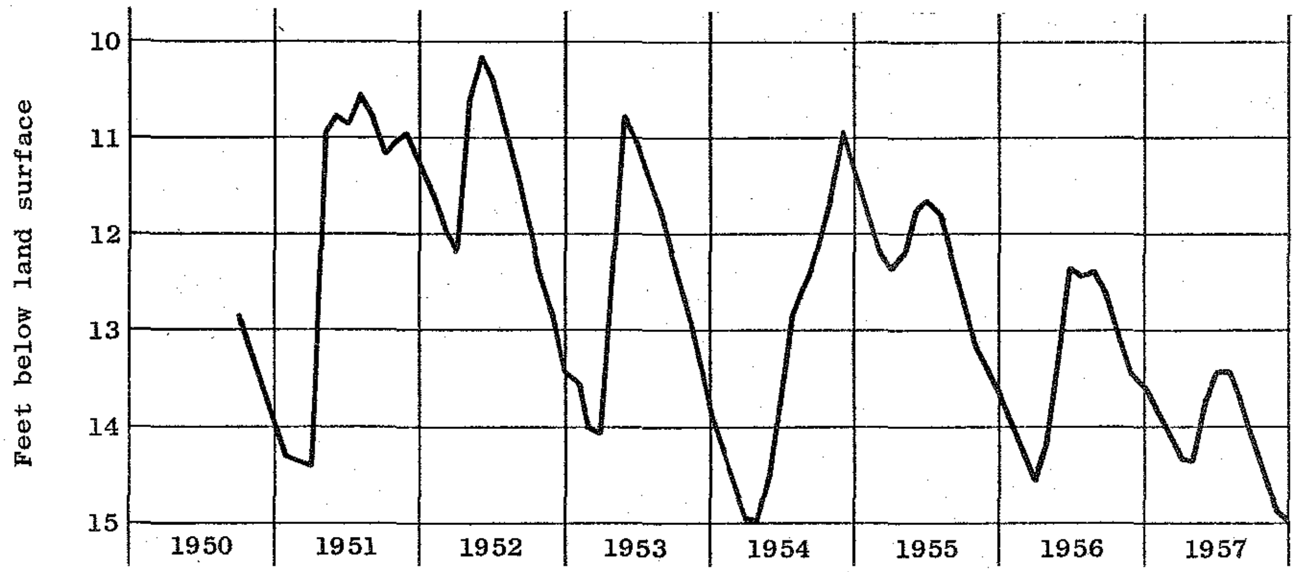

Figure 156A.--Hydrograph of well Ws-20/8/10-7.

Waushara Co. U. S. Geol. Survey. SE¼SE¼ sec. 10, T. 20 N., R. 8 E. Driven observation water-table well in sand of Pleistocene age, diam 1¼ in, depth 17 ft, cased to 15, well point 15-17. Lsd, 1,104 ft above msl. MP, top of casing, at lsd. Measured weekly. Lowest monthly plotted.

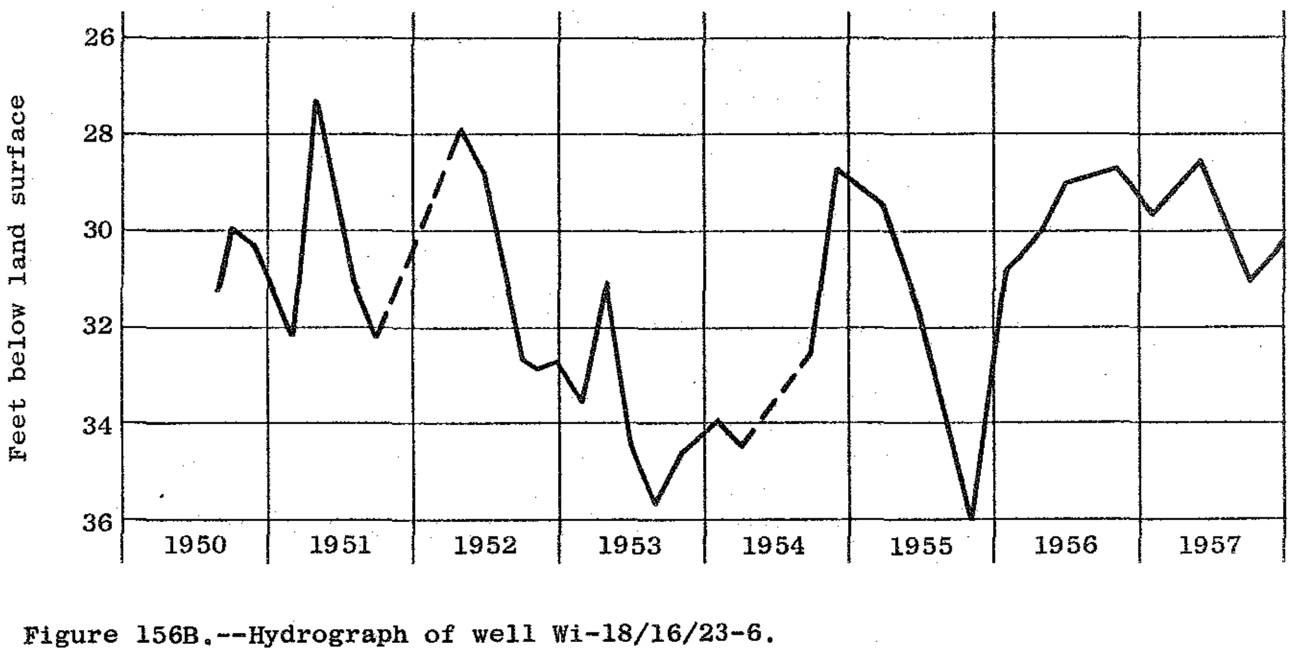

Figure 156B.--Hydrograph of well Wi-18/16/23-6.

Winnebago Co. City of Oshkosh. Board of Education. Wisconsin Ave. and Algoma Blvd. NE¼NE¼ sec. 23, T. 18 N., R. 16 E. Drilled unused artesian well in St. Peter sandstone, diam 8 in, reported depth 200 ft. MP, 3/4-in bushing on top of well, 6.00 ft below lsd. Measured bi-monthly. All plotted.

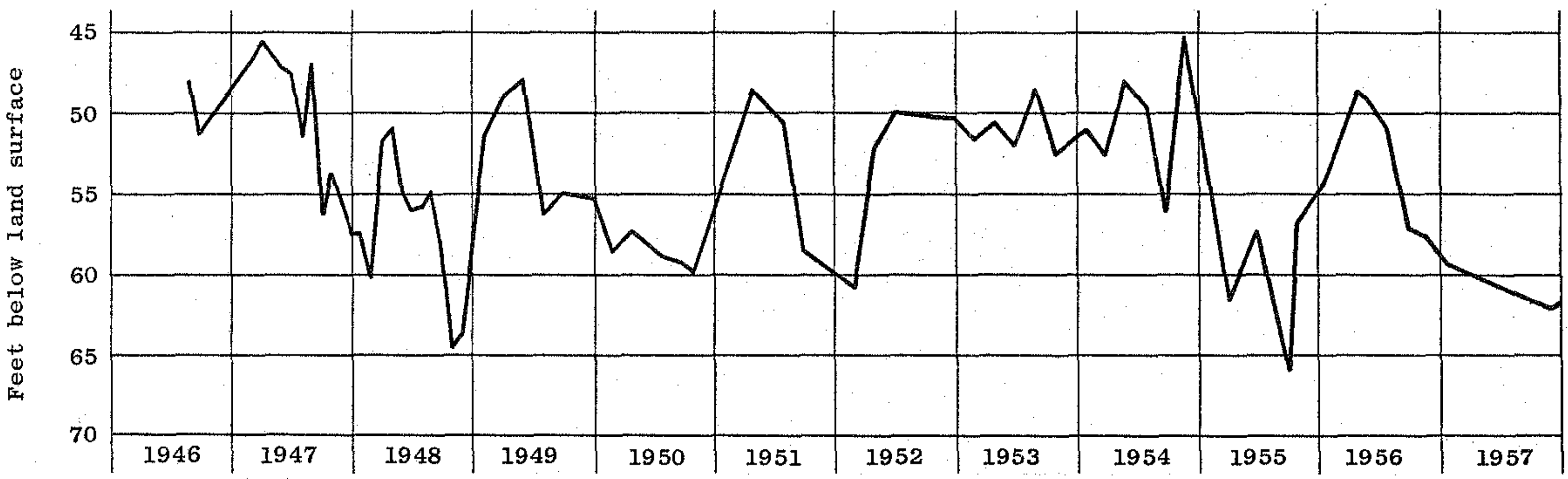

Figure 157.--Hydrograph of well Wi-20/17/20-1.

Winnebago Co. Oak Hill Cemetery. NE¼SE¼ sec. 20, T. 20 N., R. 17 E. Drilled irrigation artesian well in sandstone of Cambrian age, reported depth 340 ft. Lsd, 776 ft above msl. MP, end of 3/8 in pipe in base, 3.30 ft below lsd. Measured bi-monthly. All plotted.

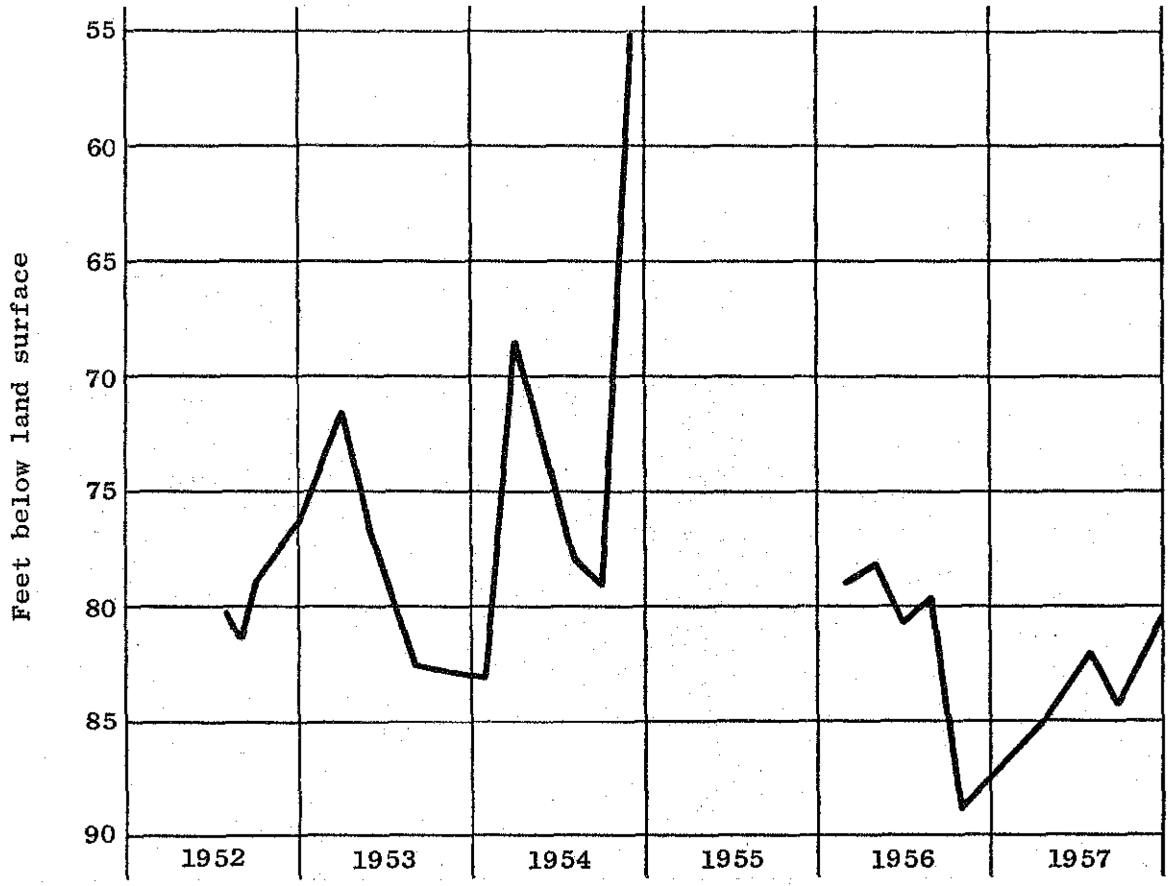

Figure 158.--Hydrograph of well Wi-20/17/22-20.

Winnebago Co. Gilbert Paper Co. SE¼NE¼ sec. 22, T. 20 N., R. 17 E. Drilled unused artesian well in sandstone of Cambrian age, diam 5 in, reported depth 900 ft. Lsd, 746 ft above msl. MP, top of concrete around casing, 2.0 ft below lsd. Measured bi-monthly. All plotted.

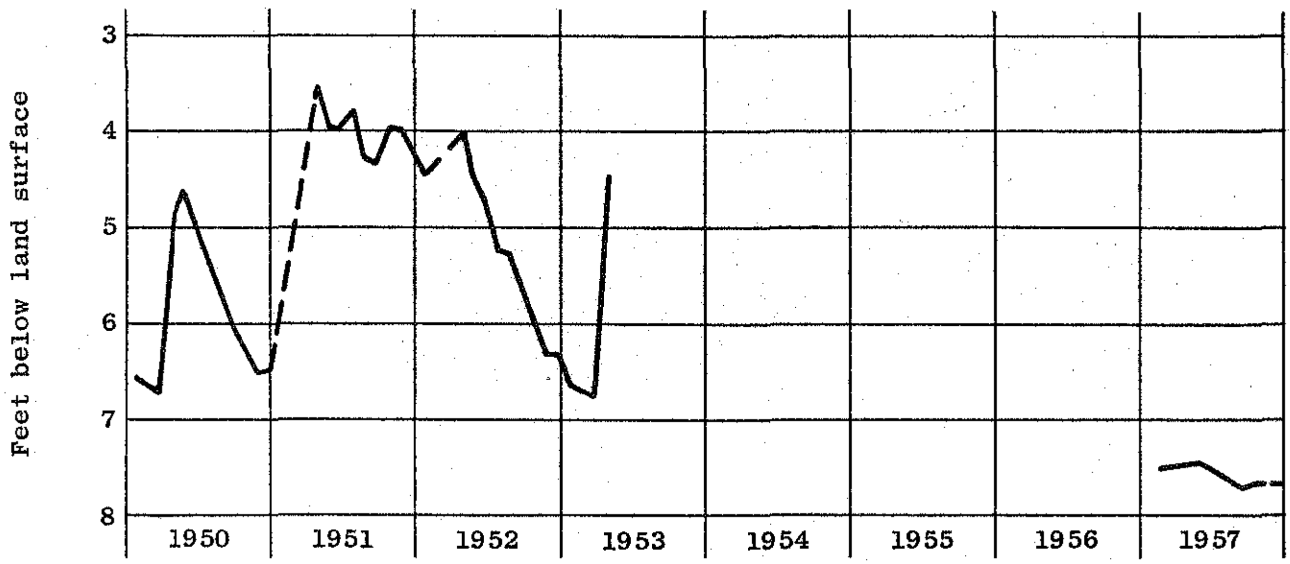

Figure 159.--Hydrograph of well Wd-22/6/16-1.

Wood Co. City of Wisconsin Rapids. SE¼NW¼ sec. 16, T. 22 N., R. 6 E. Drilled unused water-table well in deposits of Pleistocene age, diam 10 in, depth 25 ft, cased to 15, screened 15-25. Lsd, 1,001.80 ft above msl. MP, top of casing, 1.5 ft above lsd. Measured bi-monthly. All plotted.

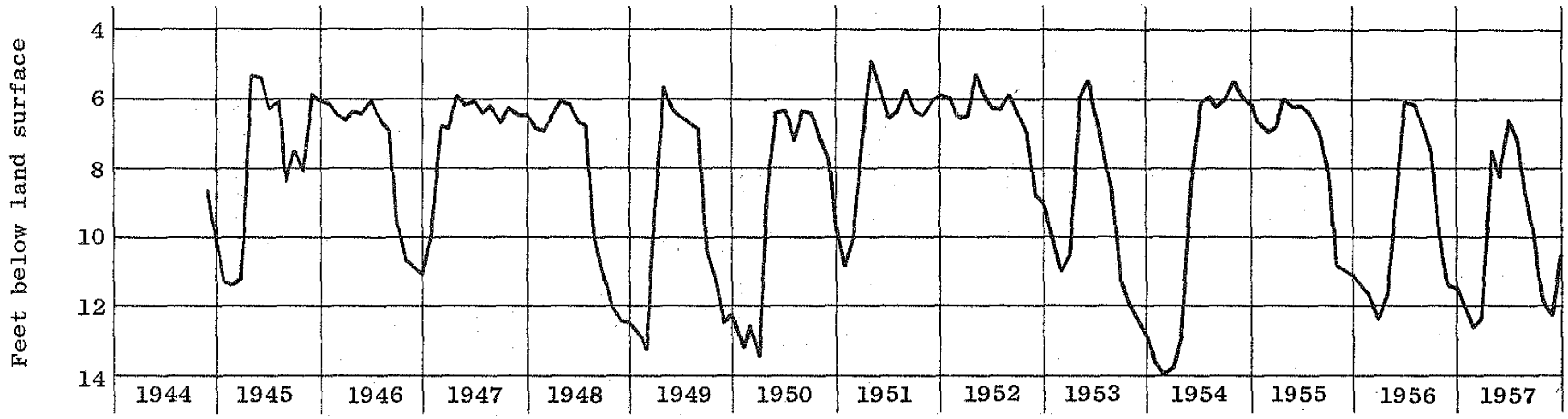

Figure 160.--Hydrograph of well Wd-23/4/2-29.

Wood Co. Elmer Aschenbrenner. NE¼NE¼ sec. 2, T. 23 N., R. 4 E. Drilled unused water-table well in sand of Pleistocene age, diam 8 to 6 in, depth 18 ft. MP, top of casing, 0.40 ft above lsd. Measured weekly. Lowest monthly plotted.