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WATER LEVELS IN ARTESIAN AND NONARTESIAN AQUIFERS OF FLORIDA IN 1960

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By
Henry G. Healy

The purpose of this report is to summarize the trends and fluctuations of water levels in the principal artesian and nonartesian (water-table) ground-water reservoirs or aquifers of Florida during 1960.

Adequate water supplies are essential to the continued industrial and municipal growth of the State. Since World War II, particularly during the last decade, the demand for ground water for industrial and municipal use has increased yearly in many parts of the State. At present, the demand has not exceeded the ground-water supply in most areas but the supply is limited and if the demand for water continues to increase as it has during the last decade, many areas may have ground-water shortages in the future. In order to prevent such future shortages, the present supplies must be appraised and effectively utilized. The measurement of water-level fluctuations in observation wells is an important phase in the appraisal of ground-water resources of the State.

The Floridan and Biscayne aquifers are two of the most important aquifers in the State. The areal extent of these aquifers is shown in figure 1. The Floridan aquifer underlies most of the State and it is the principal source of ground water in central, northern, and most of northwestern Florida. Highly mineralized water precludes the usefulness of the Floridan aquifer as a source of potable water supply in some coastal areas and most of southern Florida. In these

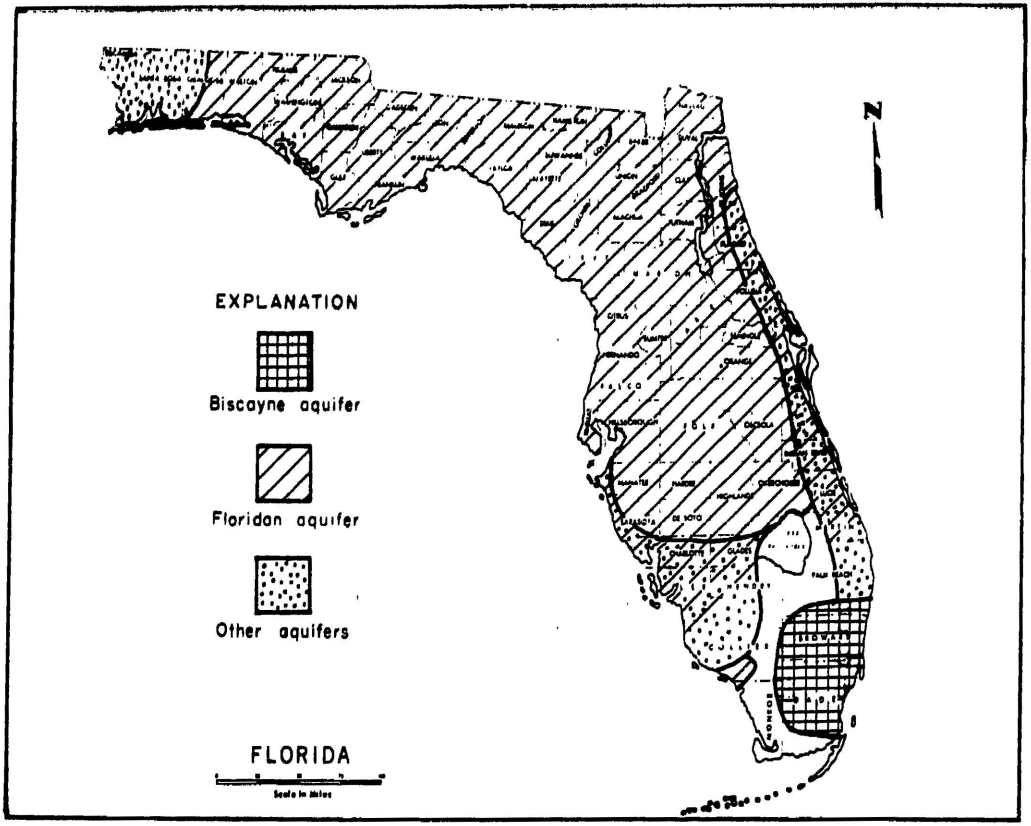


Figure 1. Map showing extent of principal aquifers and sources of ground-water supplies.

areas, the shallow nonartesian (water-table) aquifers are the chief source of ground water. The Biscayne aquifer in southern Florida is the most highly productive of the shallow nonartesian aquifers in Florida. In northwestern Florida, unconsolidated deposits of sand and gravel yield large supplies of ground water for industrial and municipal uses.

The statewide observation well network is an integral part of the Federal-State cooperative program for the investigation of ground-water resources of the State. At present, the statewide network includes a total of 727 observation wells in 45 of the 67 counties of the State; of these, measurements for 163 wells are published periodically in U. S. Geological Survey water-supply papers. This report presents hydrographs of water-level fluctuations in 63 observation wells selected from the statewide network. Location of the selected wells are shown in figure 2. Additional water-level data for the wells used in this report and water-level data for all other wells in the statewide network are available from the office of the U. S. Geological Survey, Ground Water Branch, Tallahassee, Florida.

Fluctuations of ground-water levels reflect changes in the quantity of water stored in an aquifer. The annual net changes of water levels during 1960, as shown by the hydrographs, show that the amount of water stored in the principal aquifers remained about the same in northern Florida, increased in central Florida, and decreased in the southern part of the State.

Water levels in artesian aquifers were above average in most areas in northern, central, and southern Florida at the beginning of the year and then declined to below average. At the end of the year, water levels were above average in most areas in northern and central Florida, but were near or below average in most areas in southern Florida.

Water levels in nonartesian aquifers were above average at the beginning of the year, and declined to near or below average in many areas during the year. At the end of the year, water levels were below average and lower than water levels at the beginning of the year in most areas in

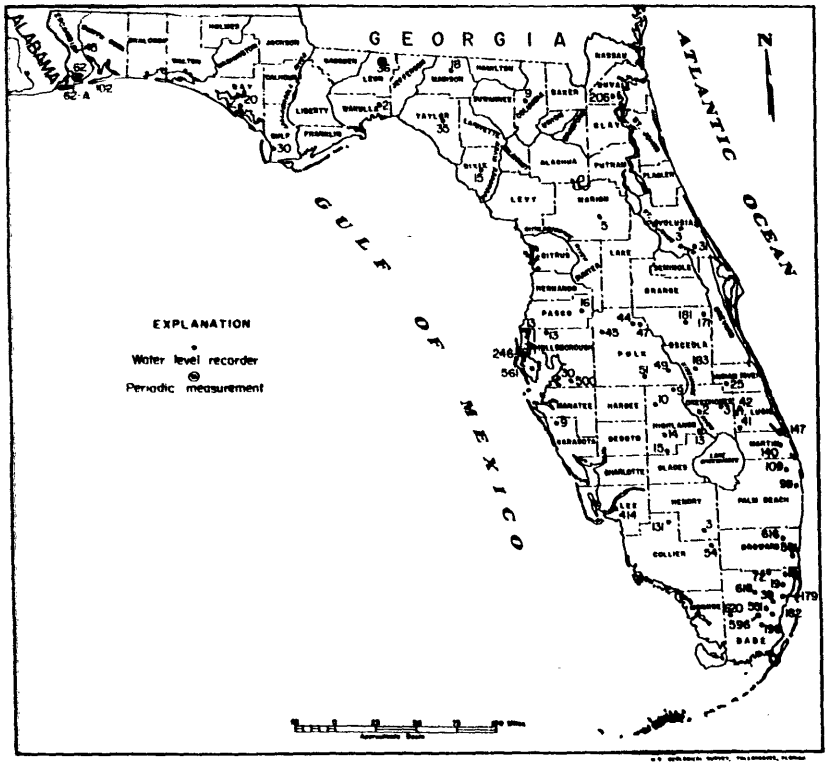


Figure 2. Locations of selected observation wells.

southern Florida. Net changes of water levels were essentially caused by below average rainfall during October through December.

Table 1 contains the following pertinent information on the observation wells: aquifer penetrated, the depth of well, and the depth of casing. Hydrographs showing the trends and fluctuations of water levels in observation wells in the artesian and nonartesian aquifers in the State are shown in figure 3.

The hydrographs show end-of-month water levels for 1960 which are compared to the maximum, minimum, and average water levels computed from end-of-month water levels for the period of record.

Table 1. Well Data on Selected Observation Wells

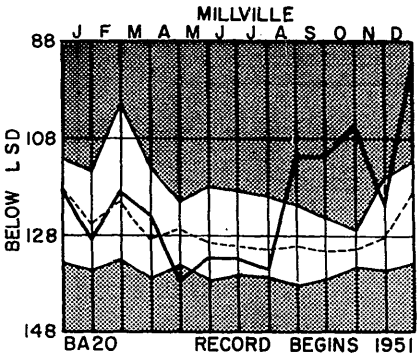
County	Well Number	Aquifer	Depth of well (in feet)	Depth of casing (in feet)	Remarks
Bay	BA 20	Floridan	506	140	Water levels affected by pumping from near-by wells
Broward	BR 561	Biscayne	20	20	
Broward	BR 616	Biscayne	25	19	
Collier	CL 54	Nonartesian	9	8	
Collier	CL 131	Nonartesian	54	22	
Columbia	CO 9	Floridan	836	---	
Dade	DA 18	Biscayne	52	---	
Dade	DA 19	Biscayne	95	91	Water levels affected by pumping
Dade	DA 39	Biscayne	6	6	Water levels affected by pumping
Dade	DA 72	Biscayne	5	4	
Dade	DA 179	Biscayne	77	---	
Dade	DA 182	Biscayne	51	---	
Dade	DA 196	Biscayne	20	---	
Dade	DA 551	Biscayne	80	71	Water levels affected by pumping
Dade	DA 596	Biscayne	13	11	
Dade	DA 618	Biscayne	20	11	
Dade	DA 620	Biscayne	16	6	
Dixie	DX 15	Floridan	97	---	Water levels occasionally affected by pumping
Duval	DU 206	Floridan	1,920	1,000	Reported depth
Escambia	ES 45	Artesian	152	152	
Escambia	ES 62	Artesian	142	142	
Escambia	ES 62A	Nonartesian	18	18	
Gulf	GF 30	Floridan	536	300	Water levels affected by pumping from near-by wells; reported depth

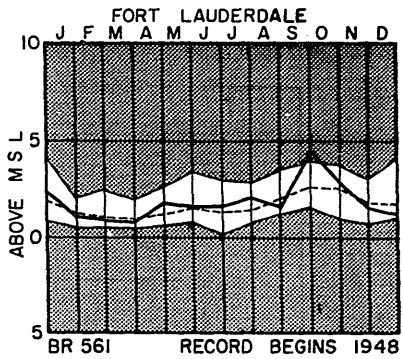
Table 1. (Continued)

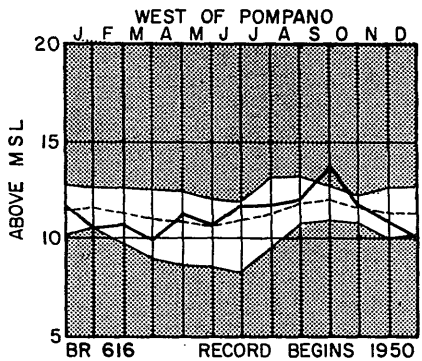
County	Well Number	Aquifer	Depth of well (in feet)	Depth of casing (in feet)	Remarks
Hendry	HE 3	Nonartesian	10	8	
Highlands	HI 9	Nonartesian	26	22	
Highlands	HI 10	Nonartesian	45	41	
Highlands	HI 13	Nonartesian	20	16	
Highlands	HI 14	Nonartesian	35	29	
Highlands	HI 15	Nonartesian	23	19	
Hillsborough	HL 13	Floridan	300	---	
Hillsborough	HL 30	Floridan	500	34	Flowing well; reported depth
Hillsborough	HL 500	Floridan	330	97	Water levels occasionally affected by pumping
Indian River	IR 25	Nonartesian	19	13	
Lee	LE 414	Nonartesian	94	60	Water levels affected by pumping from nearby wells
Leon	LN 36	Nonartesian	41	38	
Marion	MA 5	Floridan	135	135	Flowing well
Martin	MN 140	Nonartesian	31	20	
Martin	MN 147	Nonartesian	74	73	Water levels affected by pumping from nearby wells
Okeechobee	OK 2	Nonartesian	21	18	
Okeechobee	OK 3	Nonartesian	22	19	
Osceola	OS 171	Nonartesian	19	13	
Osceola	OS 181	Nonartesian	15	14	
Osceola	OS 183	Nonartesian	27	22	
Palm Beach	PB 99	Biscayne	18	16	
Palm Beach	PB 109	Nonartesian	14	9	
Pasco	PA 16	Floridan	146	20	
Pinellas	PI 13	Floridan	141	33	
Pinellas	PI 246	Floridan	208	---	
Pinellas	PI 561	Floridan	188	---	
Polk	PO 44	Floridan	195	81	Occasionally flows
Polk	PO 45	Floridan	643	325	
Polk	PO 47	Nonartesian	67	60	
Polk	PO 49	Nonartesian	17	14	
Polk	PO 51	Floridan	319	208	Water levels affected by pumping from nearby wells
St. Lucie	ST. L41	Nonartesian	17	13	
St. Lucie	ST. L42	Nonartesian	18	13	
Santa Rosa	SR 102	Nonartesian	41	31	
Sarasota	SA 9	Floridan	730	101	Occasionally flows
Taylor	TA 35	Floridan	245	189	Water levels affected by pumping from nearby wells; occasionally flows
Volusia	VO 31	Floridan	113	---	
Volusia	VO 905-113-3	Floridan	351	93	Occasionally flows
Wakulla	WA 2	Floridan	65	22	Occasionally flows

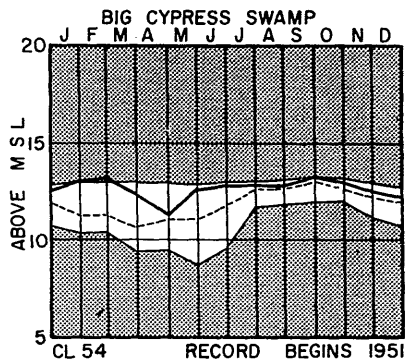
Figure 3. Hydrographs of water levels in selected wells in Florida in 1960.

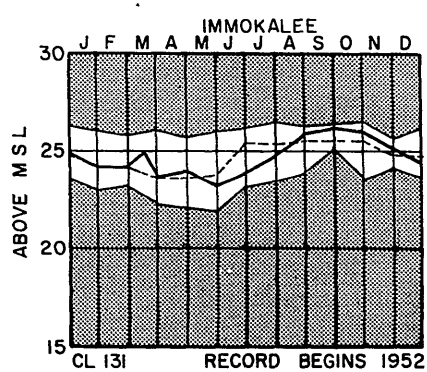
Explanation: Elevation in feet referred to mean sea level (MSL) or land-surface datum (LSD); solid line indicates elevations in 1960; unshaded portion shows maximum and minimum of record; broken line indicates normal (average) for period of record.

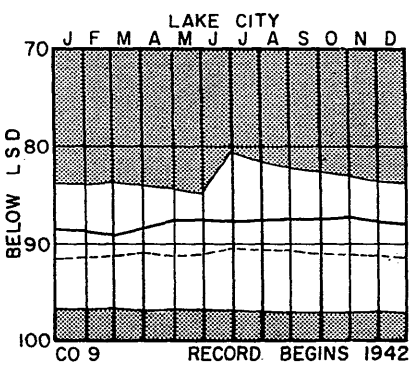

MILLVILLE
J F M A M J J A S O N D
88
108
128
148
BELOW L S D
BA20
RECORD BEGINS 1951

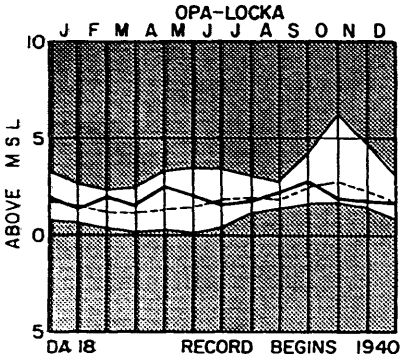

FORT LAUDERDALE
J F M A M J J A S O N D
10
5
0
5
ABOVE M S L
BR 561
RECORD BEGINS 1948

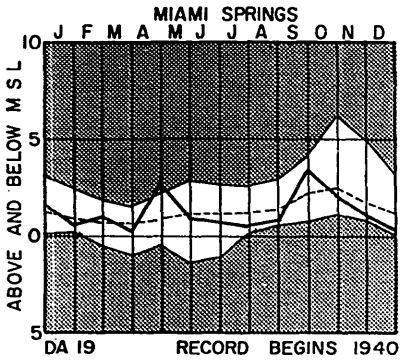

WEST OF POMPANO
J F M A M J J A S O N D
20
15
10
5
ABOVE M S L
BR 616
RECORD BEGINS 1950

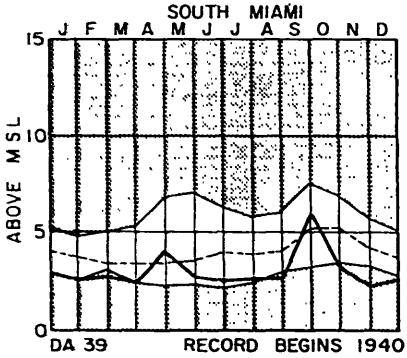

BIG CYPRESS SWAMP
J F M A M J J A S O N D
20
15
10
5
ABOVE M S L
CL 54
RECORD BEGINS 1951

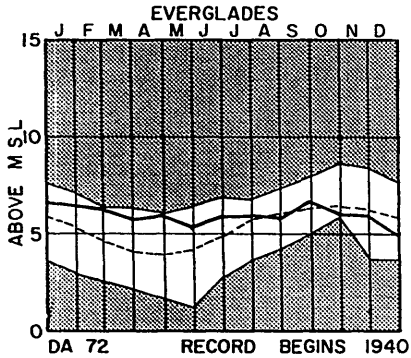

IMMOKALEE
J F M A M J J A S O N D
30
25
20
15
ABOVE M S L
CL 131
RECORD BEGINS 1952

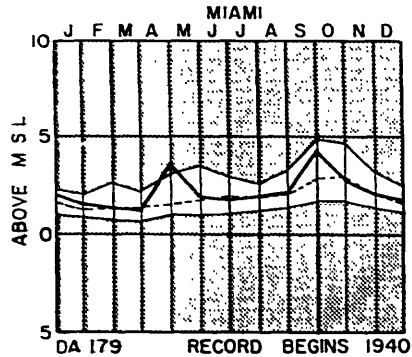

LAKE CITY
J F M A M J J A S O N D
70
80
90
100
BELOW L S D
CO 9
RECORD BEGINS 1942

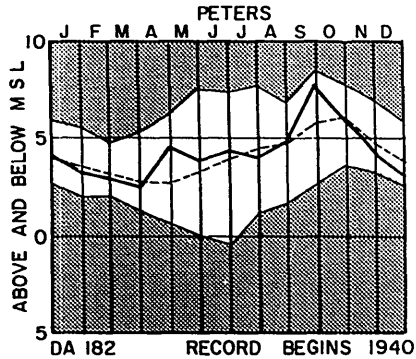

OPA-LOCKA
J F M A M J J A S O N D
10
5
0
5
ABOVE M S L
DA 18
RECORD BEGINS 1940

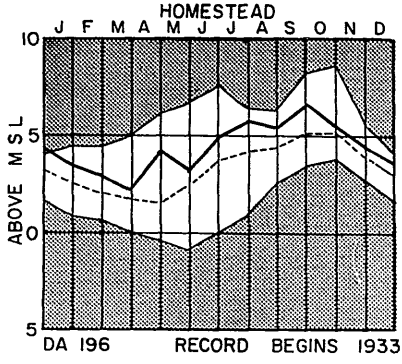

MIAMI SPRINGS
J F M A M J J A S O N D
10
5
0
5
ABOVE AND BELOW M S L
DA 19
RECORD BEGINS 1940

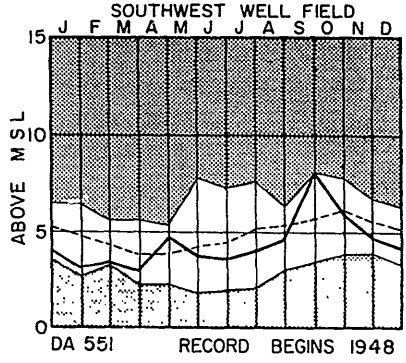

SOUTH MIAMI
J F M A M J J A S O N D
15
10
5
0
ABOVE M S L
DA 39
RECORD BEGINS 1940

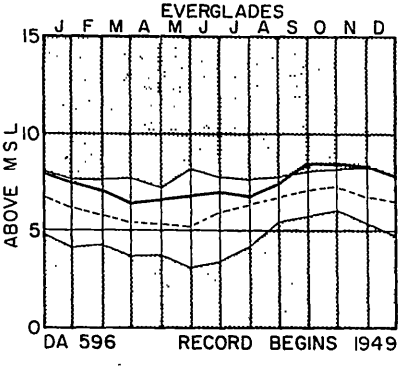

EVERGLADES
J F M A M J J A S O N D
15
10
5
0
ABOVE M S L
DA 72
RECORD BEGINS 1940

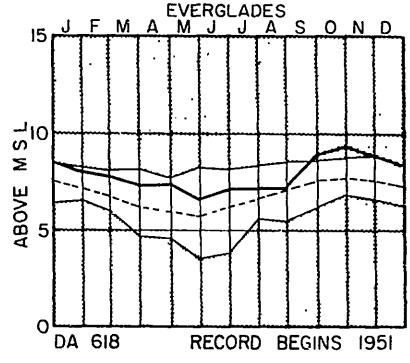

MIAMI
J F M A M J J A S O N D
10
5
0
5
ABOVE M S L
DA 179
RECORD BEGINS 1940

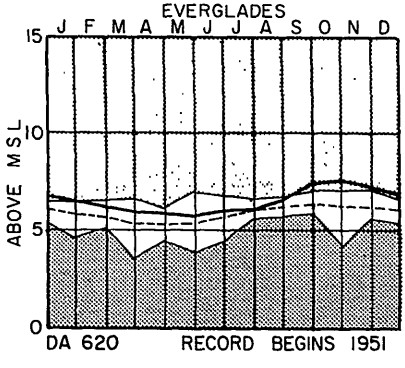

PETERS
J F M A M J J A S O N D
10
5
0
5
ABOVE AND BELOW M S L
DA 182
RECORD BEGINS 1940


HOMESTEAD
J F M A M J J A S O N D
10
5
0
5
ABOVE M S L
DA 196
RECORD BEGINS 1933


SOUTHWEST WELL FIELD
J F M A M J J A S O N D
15
10
5
0
ABOVE M S L
DA 551
RECORD BEGINS 1948


EVERGLADES
J F M A M J J A S O N D
15
10
5
0
ABOVE M S L
DA 596
RECORD BEGINS 1949


EVERGLADES
J F M A M J J A S O N D
15
10
5
0
ABOVE M S L
DA 618
RECORD BEGINS 1951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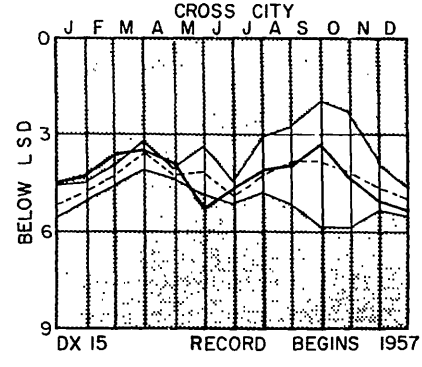
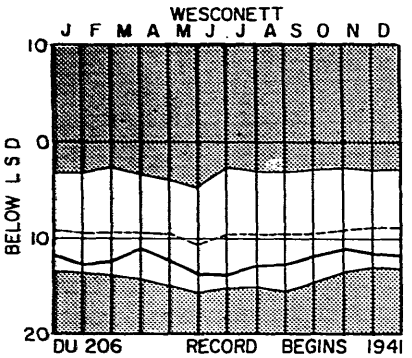
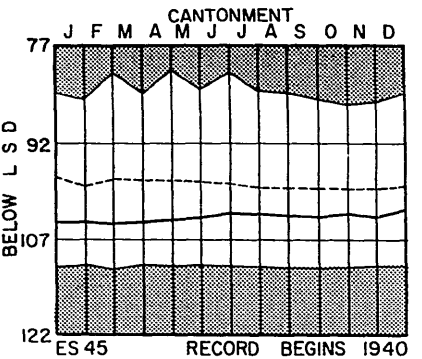
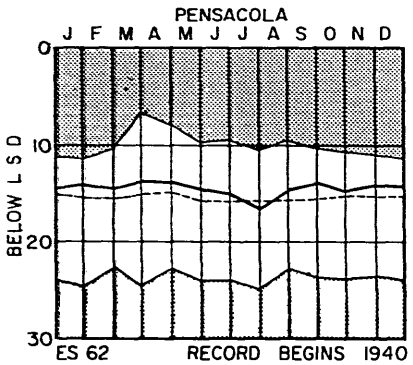
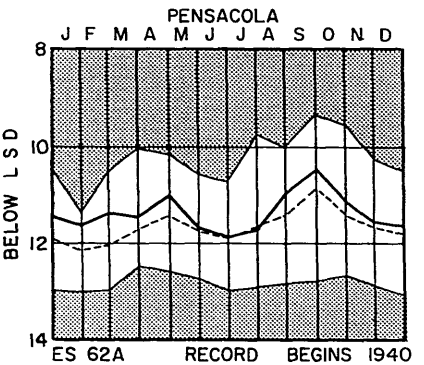
10
5
0
ABOVE M S L
DA 620
RECORD BEGINS 1951

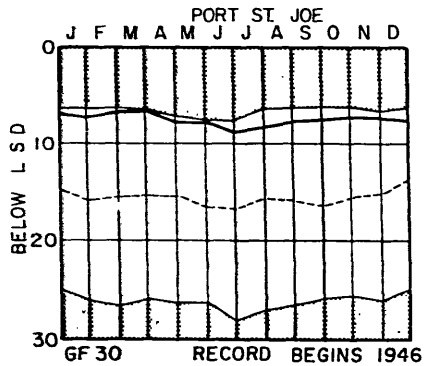

CROSS CITY
J F M A M J J A S O N D
0
3
6
9
BELOW L S D
DX 15
RECORD BEGINS 1957

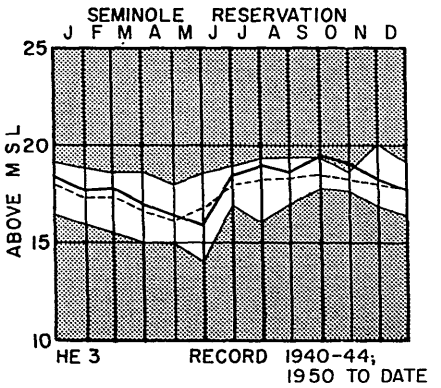

WESCONETT
J F M A M J J A S O N D
10
0
10
20
BELOW L S D
DU 206
RECORD BEGINS 1941

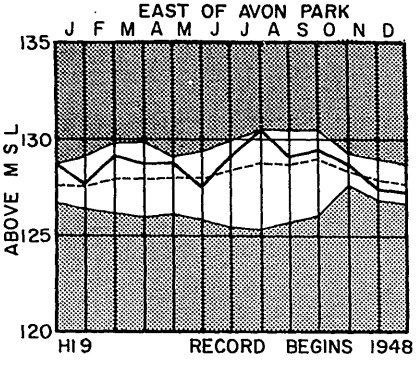

CANTONMENT
J F M A M J J A S O N D
77
92
107
122
BELOW L S D
ES 45
RECORD BEGINS 1940

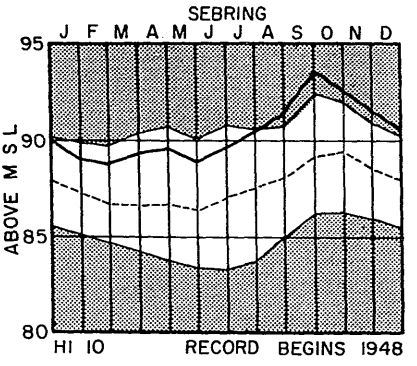

PENSACOLA
J F M A M J J A S O N D
0
10
20
30
BELOW L S D
ES 62
RECORD BEGINS 1940

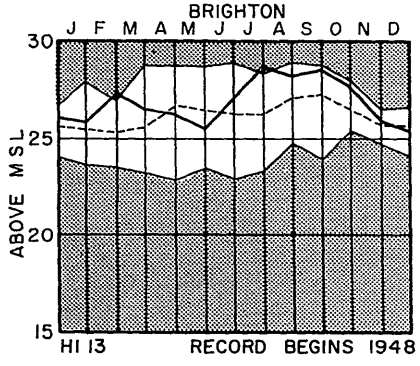

PENSACOLA
J F M A M J J A S O N D
8
10
12
14
BELOW L S D
ES 62A
RECORD BEGINS 1940

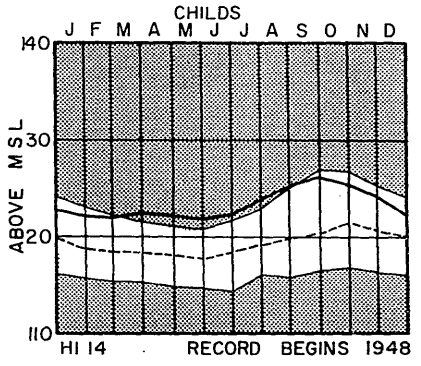

PORT ST. JOE
J F M A M J J A S O N D
0
10
20
30
BELOW L S D
GF 30
RECORD BEGINS 1946

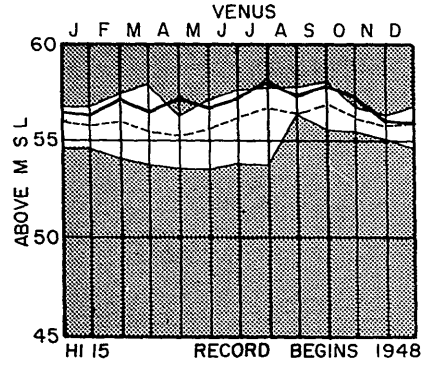

SEMINOLE RESERVATION
J F M A M J J A S O N D
25
20
15
10
ABOVE M S L
HE 3
RECORD 1940-44;
1950 TO DATE

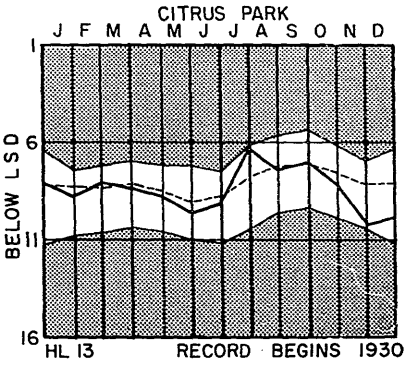

EAST OF AVON PARK
J F M A M J J A S O N D
135
130
125
120
ABOVE M S L
HI 9
RECORD BEGINS 1948

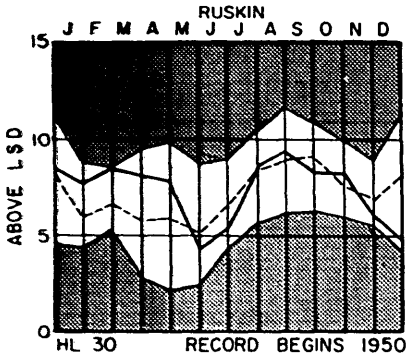

SEBRING
J F M A M J J A S O N D
95
90
85
80
ABOVE M S L
HI 10
RECORD BEGINS 1948

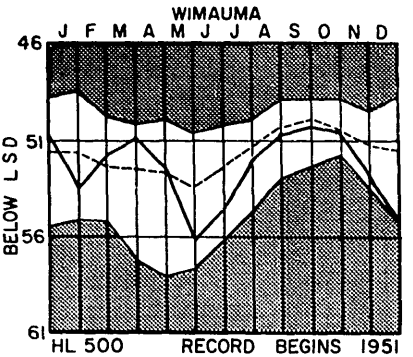

BRIGHTON
J F M A M J J A S O N D
30
25
20
15
ABOVE M S L
HI 13
RECORD BEGINS 1948

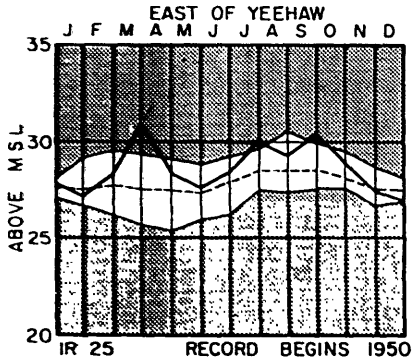

CHILDS
J F M A M J J A S O N D
140
130
120
110
ABOVE M S L
HI 14
RECORD BEGINS 1948

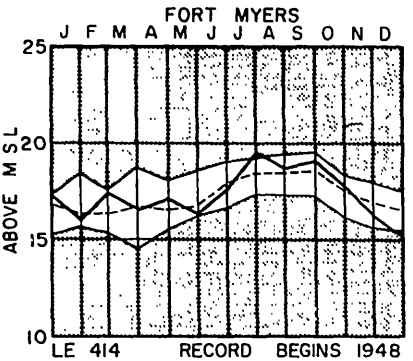

VENUS
J F M A M J J A S O N D
60
55
50
45
ABOVE M S L
HI 15
RECORD BEGINS 1948

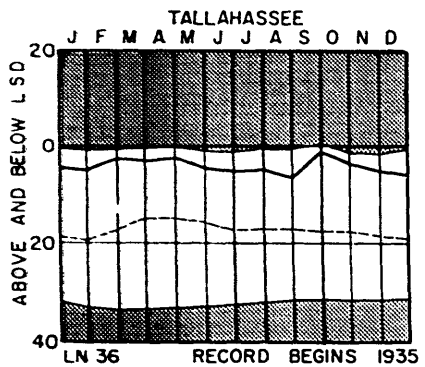

CITRUS PARK
J F M A M J J A S O N D
1
6
11
16
BELOW L S D
HL 13
RECORD BEGINS 1930

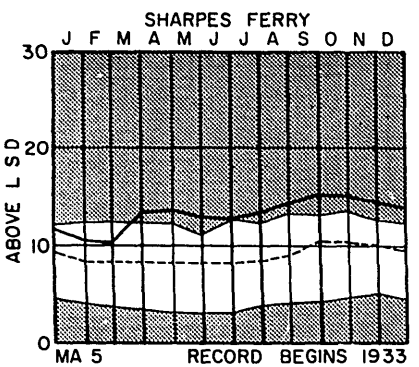

RUSKIN
J F M A M J J A S O N D
15
10
5
0
ABOVE L S D
HL 30
RECORD BEGINS 1950

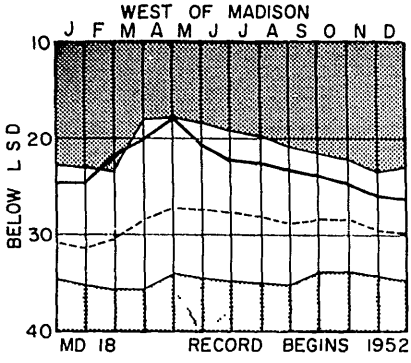

WIMAUMA
J F M A M J J A S O N D
46
51
56
61
BELOW L S D
HL 500
RECORD BEGINS 1951

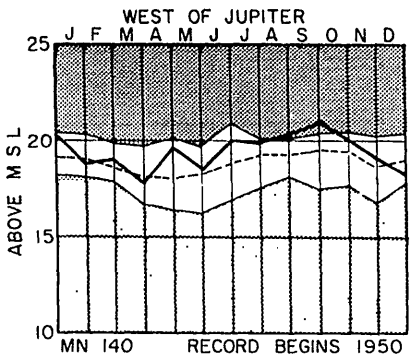

EAST OF YEEHAW
J F M A M J J A S O N D
35
30
25
20
ABOVE M S L
IR 25
RECORD BEGINS 1950

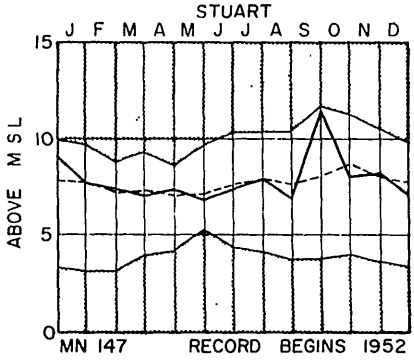

FORT MYERS
J F M A M J J A S O N D
25
20
15
10
ABOVE M S L
LE 414
RECORD BEGINS 1948

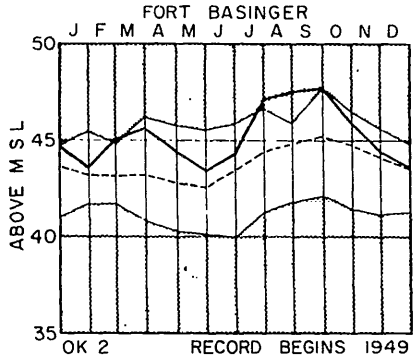

TALLAHASSEE
J F M A M J J A S O N D
20
0
20
40
ABOVE AND BELOW L S D
LN 36
RECORD BEGINS 1935

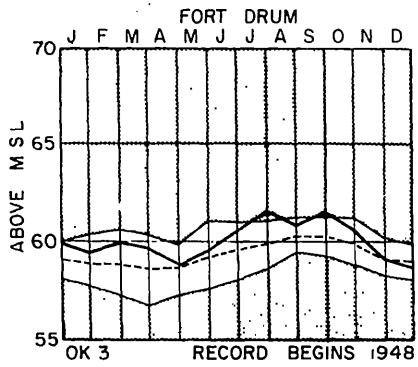

SHARPES FERRY
J F M A M J J A S O N D
30
20
10
0
ABOVE L S D
MA 5
RECORD BEGINS 1933

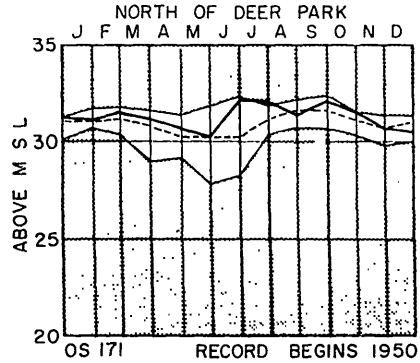

WEST OF MADISON
J F M A M J J A S O N D
10
20
30
40
BELOW L S D
MD 18
RECORD BEGINS 1952

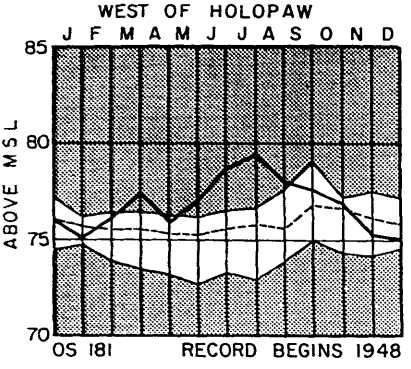

WEST OF JUPITER
J F M A M J J A S O N D
25
20
15
10
ABOVE M S L
MN 140
RECORD BEGINS 1950

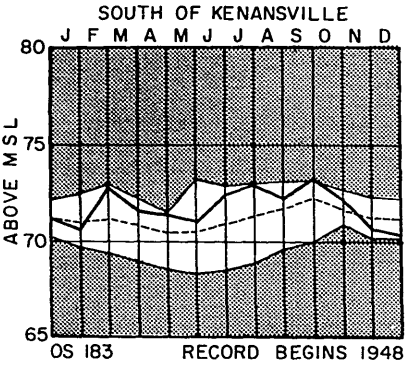

STUART
J F M A M J J A S O N D
15
10
5
0
ABOVE M S L
MN 147
RECORD BEGINS 1952

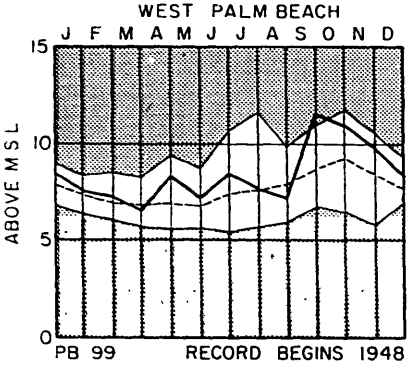

FORT BASINGER
J F M A M J J A S O N D
50
45
40
35
ABOVE M S L
OK 2
RECORD BEGINS 1949

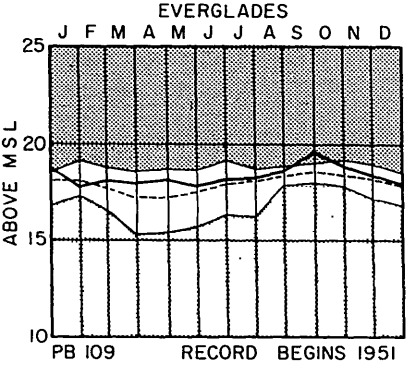

FORT DRUM
J F M A M J J A S O N D
70
65
60
55
ABOVE M S L
OK 3
RECORD BEGINS 1948

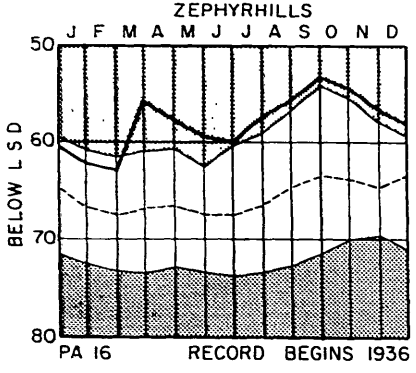

NORTH OF DEER PARK
J F M A M J J A S O N D
35
30
25
20
ABOVE M S L
OS 171
RECORD BEGINS 1950

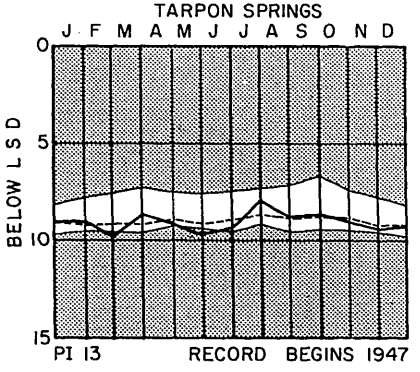

WEST OF HOLOPAW
J F M A M J J A S O N D
85
80
75
70
ABOVE M S L
OS 181
RECORD BEGINS 1948

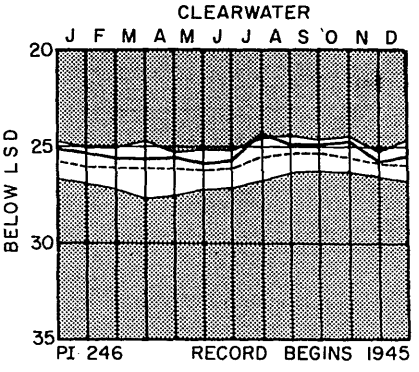

SOUTH OF KENANSVILLE
J F M A M J J A S O N D
80
75
70
65
ABOVE M S L
OS 183
RECORD BEGINS 1948

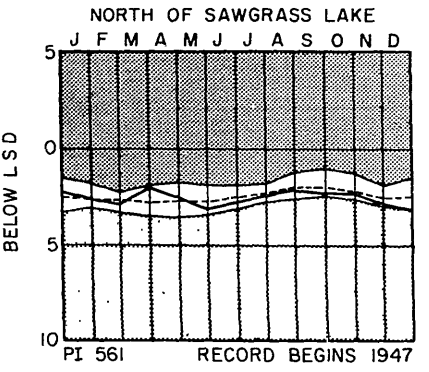

WEST PALM BEACH
J F M A M J J A S O N D
15
10
5
0
ABOVE M S L
PB 99
RECORD BEGINS 1948

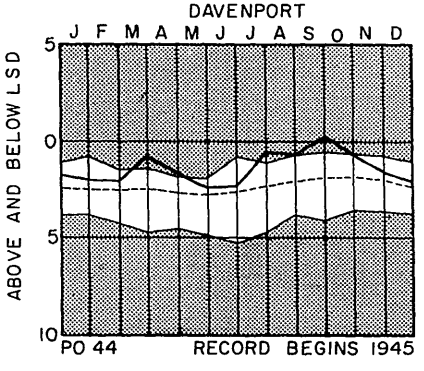

EVERGLADES
J F M A M J J A S O N D
25
20
15
10
ABOVE M S L
PB 109
RECORD BEGINS 1951

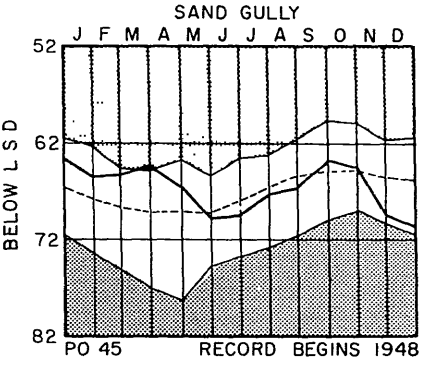

ZEPHYRHILLS
J F M A M J J A S O N D
50
60
70
80
BELOW L S D
PA 16
RECORD BEGINS 1936

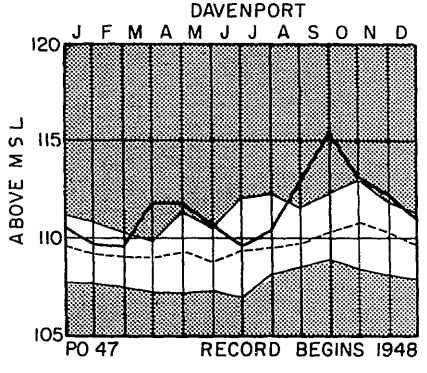

TARPON SPRINGS
J F M A M J J A S O N D
0
5
10
15
BELOW L S D
PI 13
RECORD BEGINS 1947

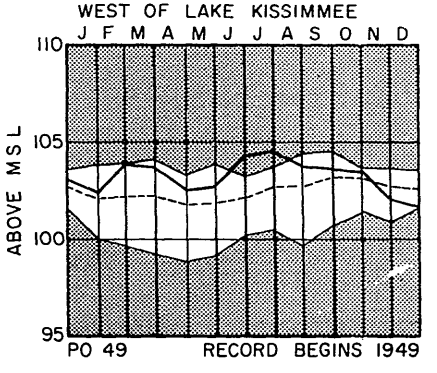

CLEARWATER
J F M A M J J A S O N D
20
25
30
35
BELOW L S D
PI 246
RECORD BEGINS 1945

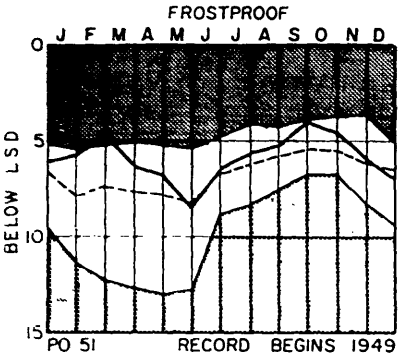

NORTH OF SAWGRASS LAKE
J F M A M J J A S O N D
5
0
5
10
BELOW L S D
PI 561
RECORD BEGINS 1947

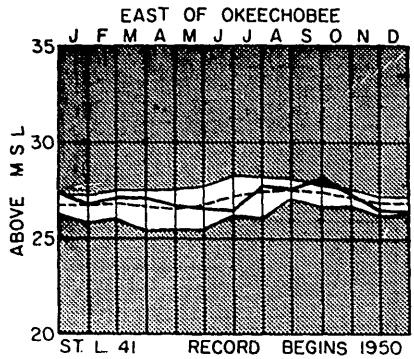

DAVENPORT
J F M A M J J A S O N D
5
0
5
10
ABOVE AND BELOW L S D
PO 44
RECORD BEGINS 1945

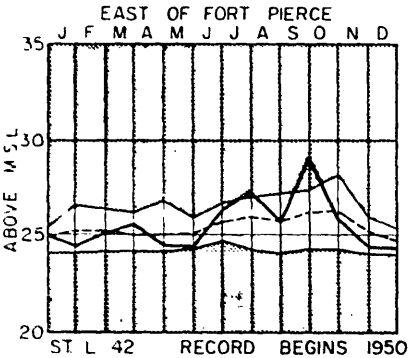

SAND GULLY
J F M A M J J A S O N D
52
62
72
82
BELOW L S D
PO 45
RECORD BEGINS 1948

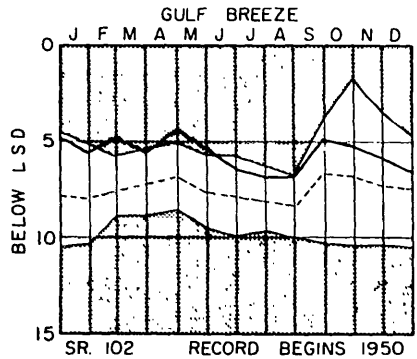

DAVENPORT
J F M A M J J A S O N D
120
115
110
105
ABOVE M S L
PO 47
RECORD BEGINS 1948

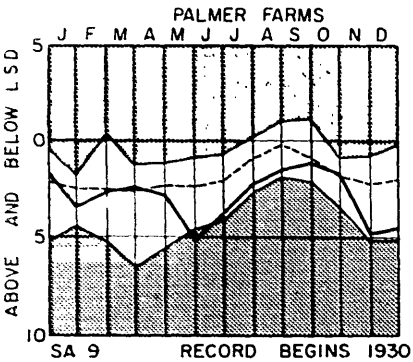

WEST OF LAKE KISSIMMEE
J F M A M J J A S O N D
110
105
100
95
ABOVE M S L
PO 49
RECORD BEGINS 1949

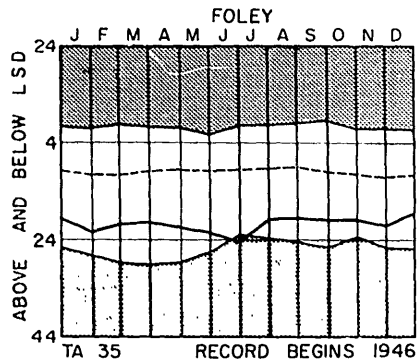

FROSTPROOF
J F M A M J J A S O N D
0
5
10
15
BELOW L S D
PO 51
RECORD BEGINS 1949

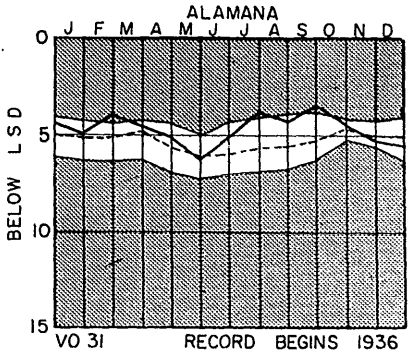

EAST OF OKEECHOBEE
J F M A M J J A S O N D
35
30
25
20
ABOVE M S L
ST. L. 41
RECORD BEGINS 1950

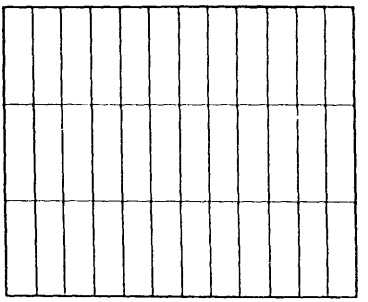

EAST OF FORT PIERCE
J F M A M J J A S O N D
35
30
25
20
ABOVE M S L
ST. L. 42
RECORD BEGINS 1950

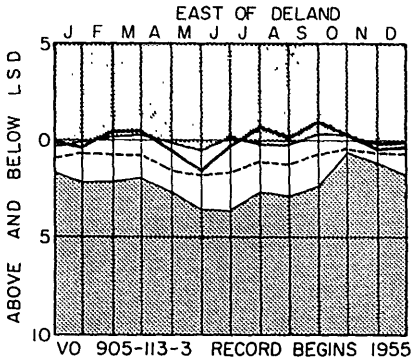

GULF BREEZE
J F M A M J J A S O N D
0
5
10
15
BELOW L S D
SR. 102
RECORD BEGINS 1950

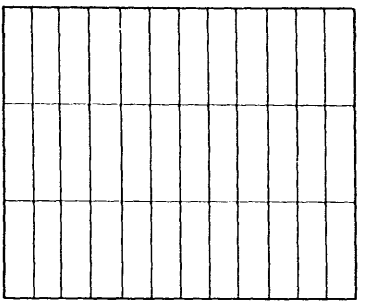

PALMER FARMS
J F M A M J J A S O N D
5
0
5
10
ABOVE AND BELOW L S D
SA 9
RECORD BEGINS 1930

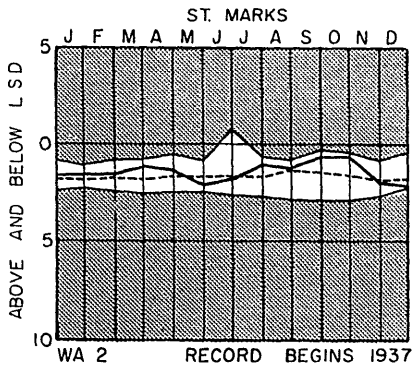

FOLEY
J F M A M J J A S O N D
24
4
24
44
ABOVE AND BELOW L S D
TA 35
RECORD BEGINS 1946

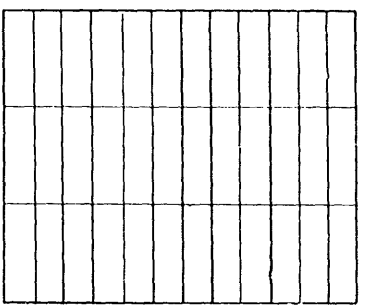

ALAMANA
J F M A M J J A S O N D
0
5
10
15
BELOW L S D
VO 31
RECORD BEGINS 1936

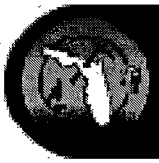



EAST OF DELAND
J F M A M J J A S O N D
5
0
5
10
ABOVE AND BELOW L S D
VO 905-113-3 RECORD BEGINS 1955




ST. MARKS
J F M A M J J A S O N D
5
0
5
10
ABOVE AND BELOW L S D
WA 2
RECORD BEGINS 1937





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