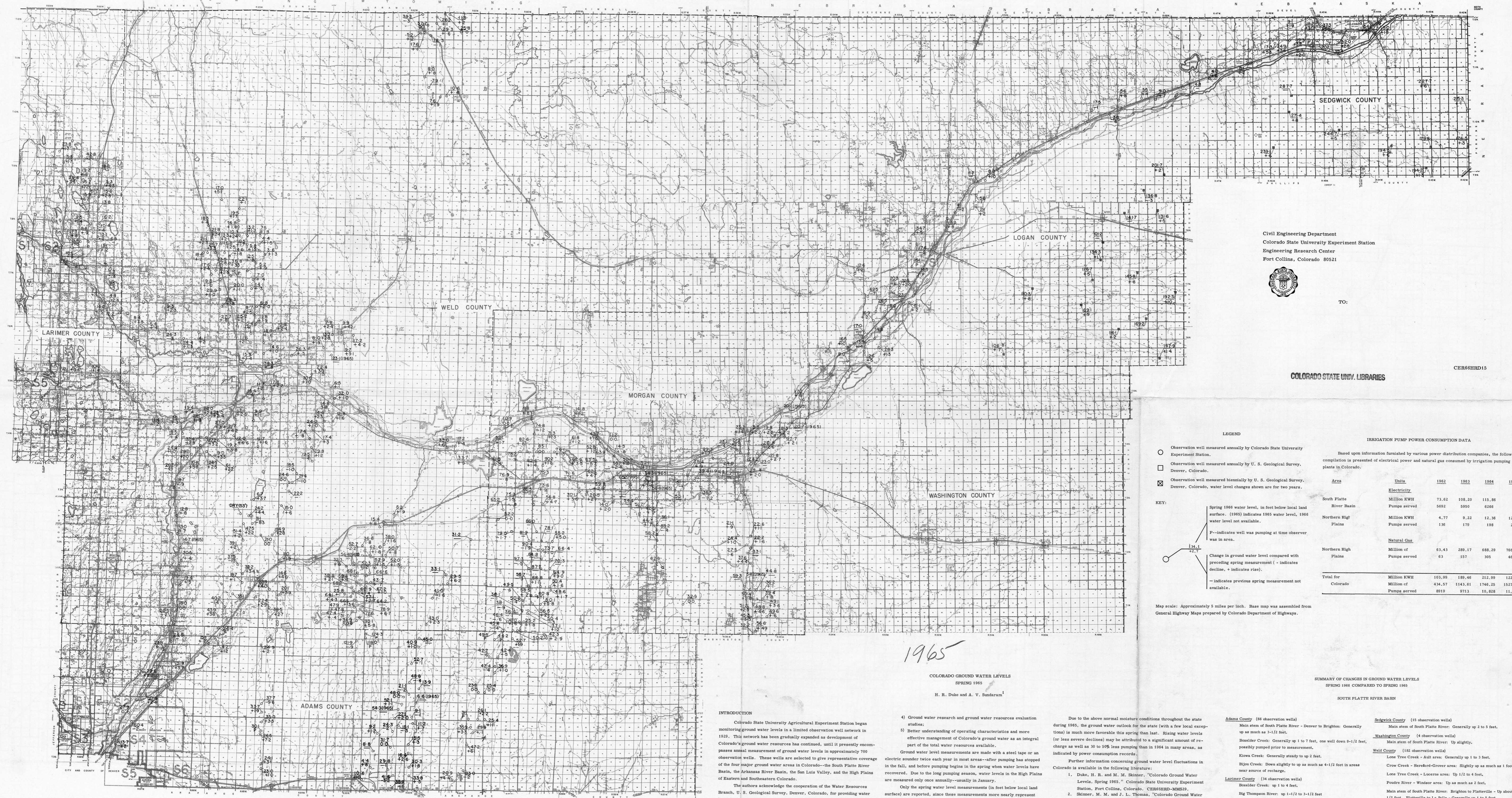


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Civil Engineering Department
 Colorado State University Experiment Station
 Engineering Research Center
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LEGEND

- Observation well measured annually by Colorado State University Experiment Station.
 - Observation well measured annually by U. S. Geological Survey, Denver, Colorado.
 - ⊗ Observation well measured biennially by U. S. Geological Survey, Denver, Colorado, water level changes shown are for two years.
- KEY:
- Spring 1966 water level, in feet below local land surface. (1965) indicates 1965 water level, 1966 water level not available.
 - P--indicates well was pumping at time observation was in area.
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Map scale: Approximately 5 miles per inch. Base map was assembled from General Highway Maps prepared by Colorado Department of Highways.

IRRIGATION PUMP POWER CONSUMPTION DATA

Based upon information furnished by various power distribution companies, the following compilation is presented of electrical power and natural gas consumed by irrigation pumping plants in Colorado.

Area	Units	1962	1963	1964	1965
		Electricity			
South Platte River Basin	Million KWH	73.62	106.20	115.86	
	Pumps served	5692	5950	6286	
Northern High Plains	Million KWH	4.77	9.22	12.36	12.36
	Pumps served	196	179	198	246
Natural Gas					
Northern High Plains	Million cf	61.43	289.17	688.29	766.22
	Pumps served	63	157	305	469
Total for Colorado	Million KWH	103.99	189.46	212.89	122.12
	Million cf	434.67	1143.61	1746.25	1527.52
	Pumps served	8919	9713	10,828	11,424

SUMMARY OF CHANGES IN GROUND WATER LEVELS
 SPRING 1966 COMPARED TO SPRING 1965

SOUTH PLATTE RIVER BASIN

- Adams County** (66 observation wells)
 - Main stem of South Platte River - Denver to Brighton: Generally up as much as 3-1/2 feet.
 - Boalder Creek: Generally up 1 to 7 feet, one well down 9-1/2 feet, possibly pumped prior to measurement.
 - Kiowa Creek: Generally steady to up 2 feet.
 - Bijou Creek: Down slightly to up as much as 4-1/2 feet in areas near source of recharge.
- Larimer County** (34 observation wells)
 - Boalder Creek: up 1 to 4 feet.
 - Big Thompson River: up 1-1/2 to 3-1/2 feet
- Logan County** (35 observation wells)
 - Main stem of South Platte River: Generally up 1/2 to 1-1/2 feet.
- Morgan County** (31 observation wells)
 - Main stem of South Platte River: Generally up 1 to 3 feet.
 - Bijou Creek: Generally down to 1 foot along Antelope Creek, up 1 to 6 feet along Kiowa Creek.
 - Boalder Creek: Little significant change.
 - Beaver Creek: up 1 to 5 feet.
- Sedgwick County** (15 observation wells)
 - Main stem of South Platte River: Generally up 2 to 5 feet.
- Washington County** (4 observation wells)
 - Main stem of South Platte River: Up slightly, possibly pumped prior to measurement.
- Weld County** (182 observation wells)
 - Lone Tree Creek - Ault area: Generally up 1 to 3 feet.
 - Crow Creek - Herford-Grover area: Slightly up as much as 1 foot.
 - Lone Tree Creek - Lucerne area: Up 1/2 to 4 feet.
 - Poudre River - Windsor area: Up as much as 2 feet.
 - Main stem of South Platte River: Brighton to Platteville - Up about 1/2 foot. Platteville to La Salle - Generally up 1 to 5 feet.
 - Bebee Sapp-Hudson area: Most wells up 1 to 4 feet.
 - Boalder Creek - below Hudson: Up 1 to 4 feet, except east of Milton Reservoir, down 1 foot.
 - Crow Creek - Gill area: Up 1 to 4 feet.
 - Prospect Valley: Generally up 1 to 3 feet. Wells near Olds Reservoir up to 48 feet.
 - Kiowa Creek: Generally down 2 feet to up 6 feet.

COLORADO GROUND WATER LEVELS
 SPRING 1965
 H. R. Dake and A. V. Sundaram¹

INTRODUCTION

Colorado State University Agricultural Experiment Station began monitoring ground water levels in a limited observation well network in 1919. This network has been gradually expanded as development of Colorado's ground water resources has continued, until it presently encompasses annual measurement of ground water levels in approximately 700 observation wells. These wells are selected to give representative coverage of the four major ground water areas in Colorado--the South Platte River Basin, the Arkansas River Basin, the San Luis Valley, and the High Plains of Eastern and Southeastern Colorado.

The authors acknowledge the cooperation of the Water Resources Branch, U. S. Geological Survey, Denver, Colorado, for providing water level data for an additional 175 wells measured annually, and for several hundred wells measured during biennial mass measurements.

The basic information obtained from the observation well network provides valuable data which is actively used for:

- 1) Detecting areas of critical ground water depletion or accretion;
- 2) Extending existing and establishing additional historical ground water level hydrographs;
- 3) Estimating changes in ground water storage for specific areas;

- 4) Ground water research and ground water resources evaluation studies;
- 5) Better understanding of operating characteristics and more effective management of Colorado's ground water as an integral part of the total water resources available.

Ground water level measurements are made with a steel pipe or an electric sounder twice each year in most areas--after pumping has stopped in the fall, and before pumping begins in the spring when water levels have recovered. Due to the long pumping season, water levels in the High Plains are measured only once annually--usually in January.

Only the spring water level measurements (in feet below local land surface) are reported, since these measurements more nearly represent static water level conditions. For wells in which the water level was measured the previous year, changes in water level from the previous year are also noted.

This report was prepared in two sheets--one covering the South Platte River Basin and the Northern High Plains, the other covering the Arkansas River Basin, the San Luis Valley, and the Southern High Plains. Those persons specifically interested in a particular area will receive only one sheet. The second sheet or additional copies may be obtained free of charge by contacting the senior author.

Due to the above normal moisture conditions throughout the state during 1965, the ground water outlook for the state (with a few local exceptions) is much more favorable this spring than last. Rising water levels (or less severe declines) may be attributed to a significant amount of recharge as well as 30 to 50% less pumping than in 1964 in many areas, as indicated by power consumption records.

Further information concerning ground water level fluctuations in Colorado is available in the following literature:

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SOUTH PLATTE RIVER BASIN

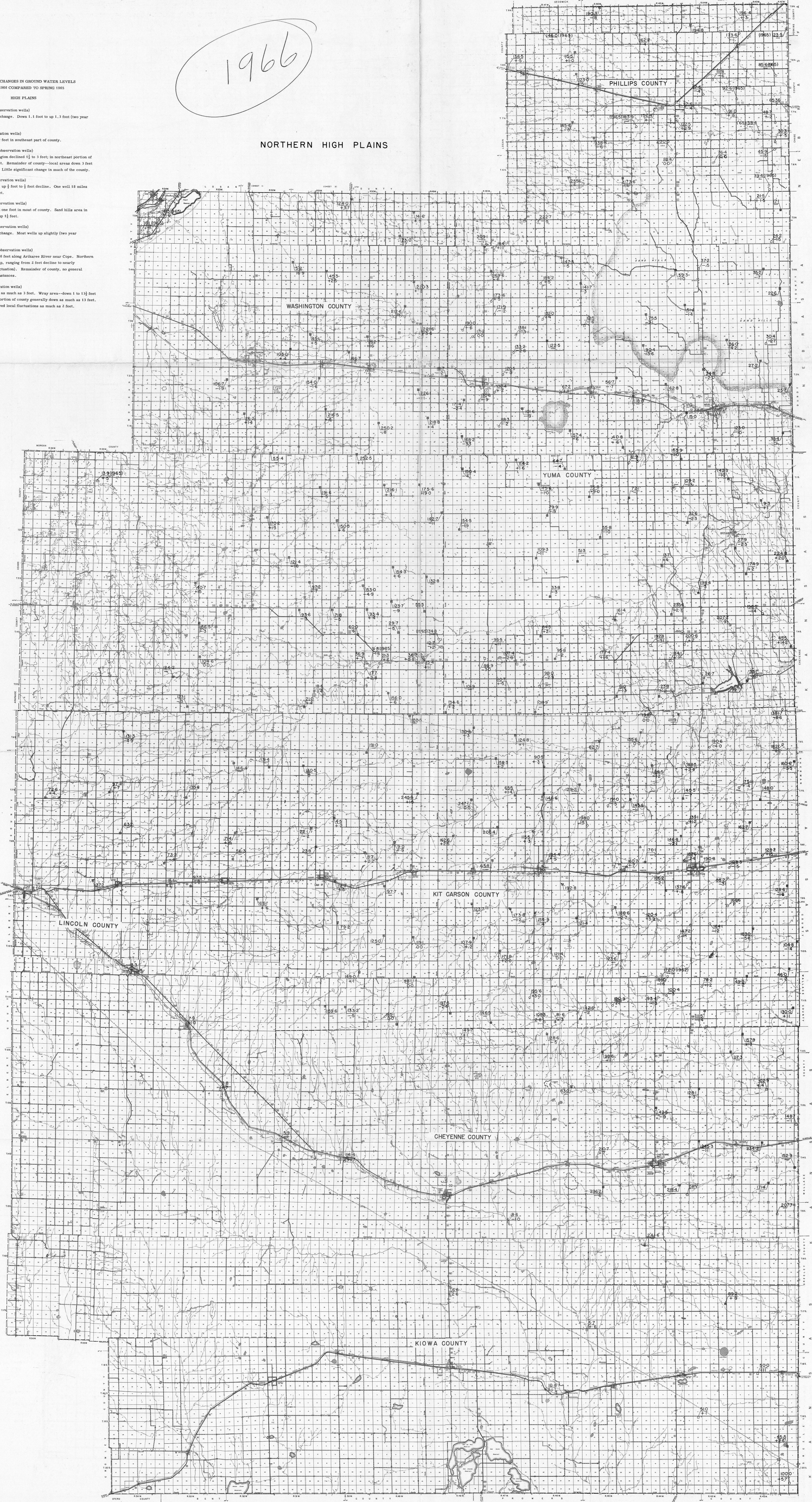
SUMMARY OF CHANGES IN GROUND WATER LEVELS
SPRING 1964 COMPARED TO SPRING 1965

HIGH PLAINS

- Cheyenne County** (18 observation wells)
Little significant change. Down 1.1 foot to up 1.3 foot (two year fluctuation).
- Kiowa County** (4 observation wells)
Up as much as 5 1/2 feet in southeast part of county.
- Kiowa County** (95 observation wells)
Wells near Burlington declined 1 1/2 to 3 feet; in northeast portion of county declined 4 to 9 feet. Remainder of county--local areas down 3 feet to up 2 1/2 feet since 1964. Little significant change in much of the county.
- Lincoln County** (13 observation wells)
Generally steady, up 1/2 foot to 1 foot decline. One well 1 1/2 miles north of Genoa down 5 feet.
- Phillips County** (33 observation wells)
Changes less than one foot in most of county. Sand hills area in southeast part of county up 1 1/2 feet.
- Sedwick County** (10 observation wells)
Little significant change. Most wells up slightly (two year fluctuation).
- Washington County** (54 observation wells)
Generally up 1/2 to 6 feet along Arkansas River near Cope. Northern half of county generally up, ranging from 2 feet decline to nearly 20 feet rise (two year fluctuation). Remainder of county, no general change except for local instances.
- Yuma County** (64 observation wells)
Yuma area--down as much as 3 feet. Wray area--down 1 to 1 1/2 feet in two years. Southern portion of county generally down as much as 13 feet. Remainder of county showed local fluctuations as much as 2 feet.

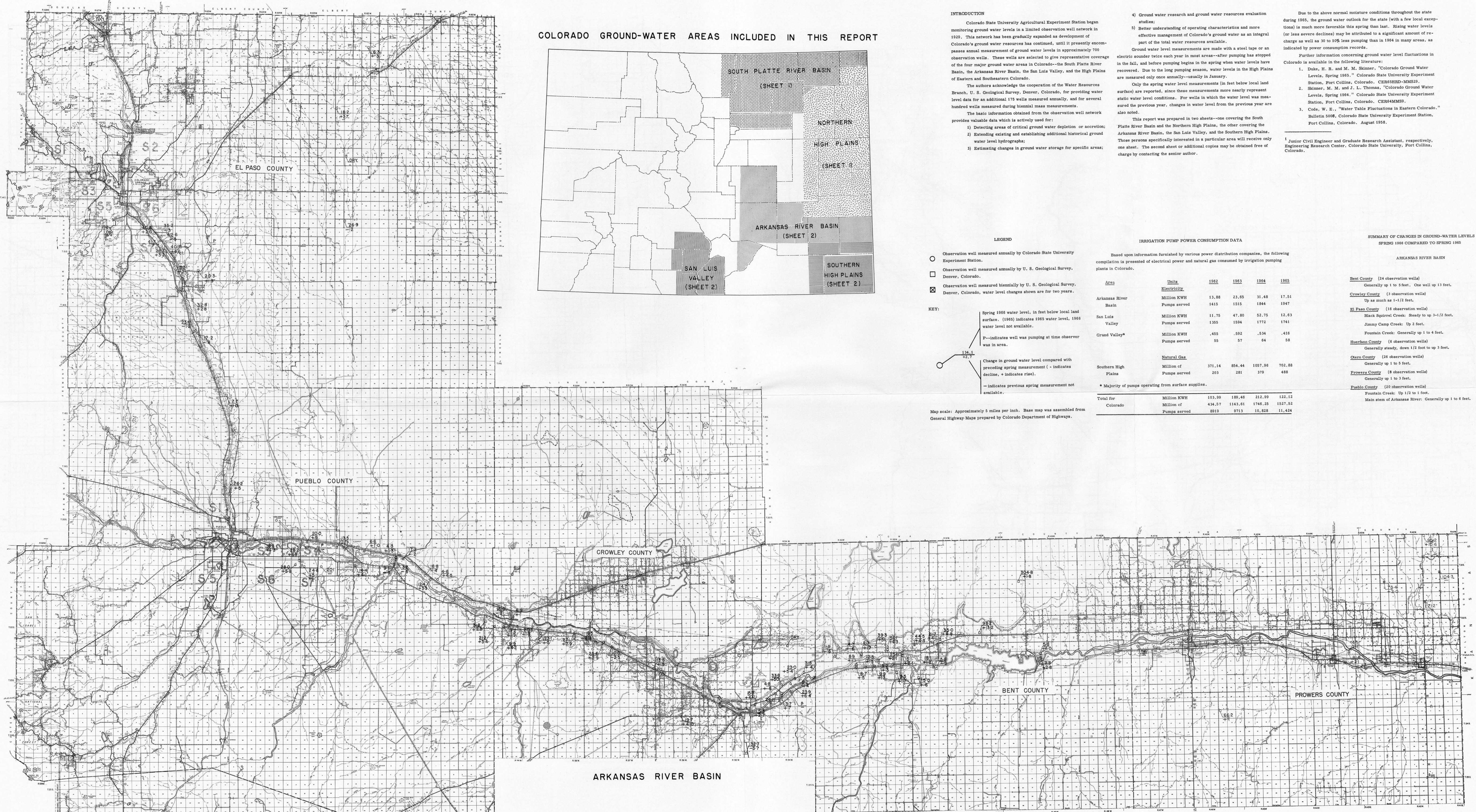
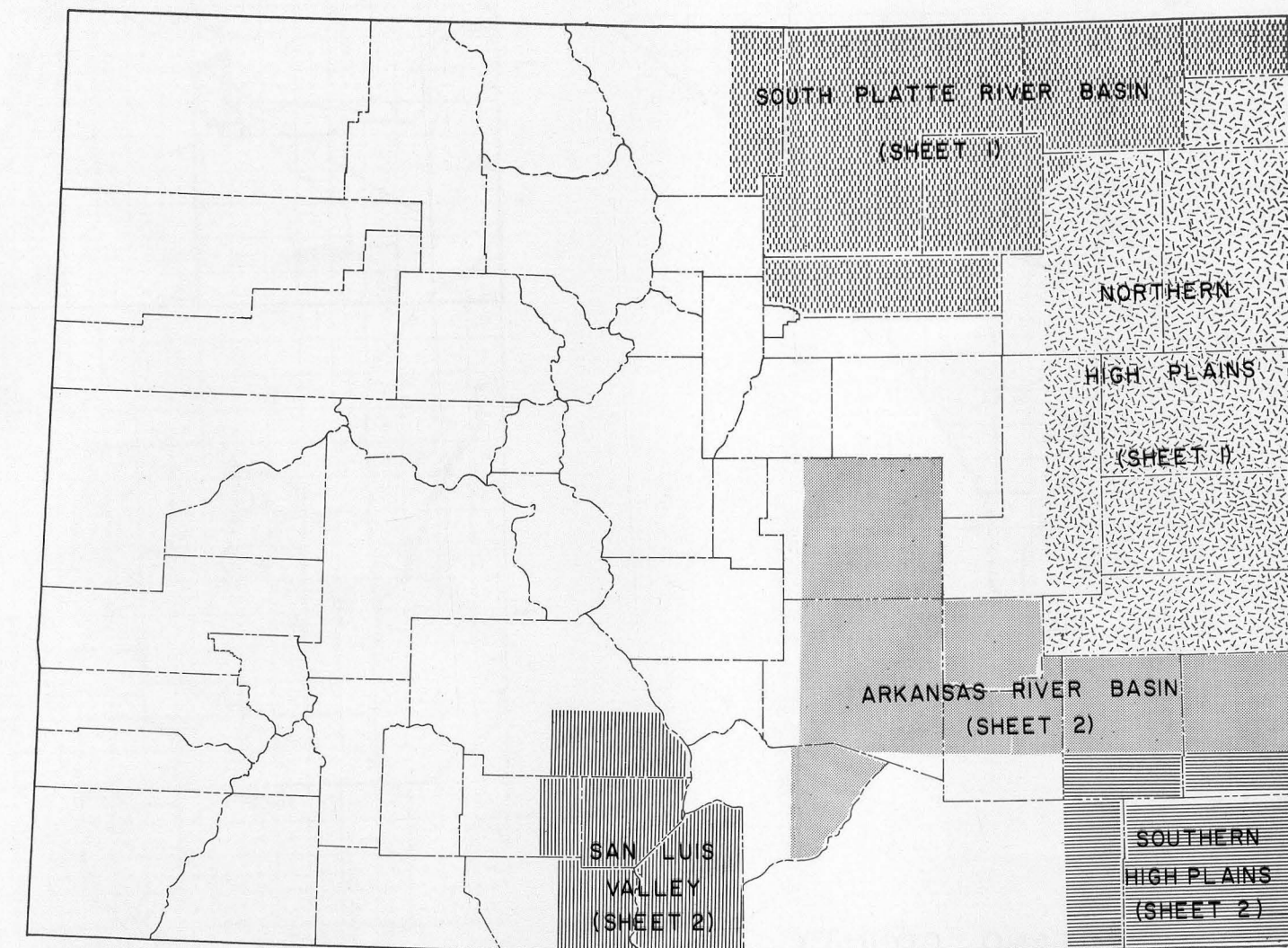
NORTHERN HIGH PLAINS

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COLORADO GROUND-WATER AREAS INCLUDED IN THIS REPORT



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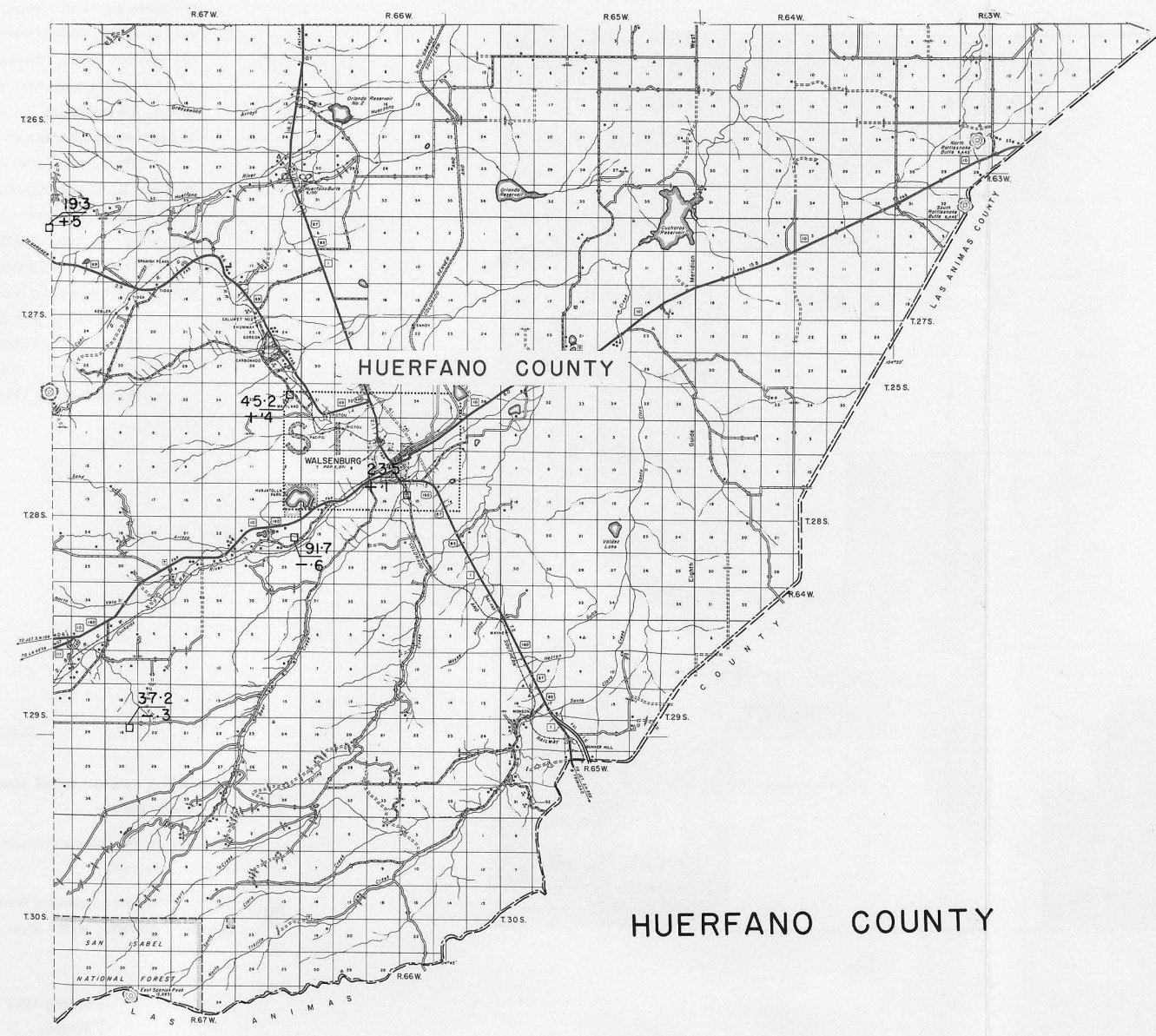
Area	Units	1962	1963	1964	1965
		Electricity			
Arkansas River Basin	Million KWH	13.88	23.65	31.48	17.51
	Pumps served	1415	1515	1844	1947
San Luis Valley	Million KWH	11.75	47.80	52.75	12.83
	Pumps served	1355	1594	1772	1741
Grand Valley*	Million KWH	455	592	534	416
	Pumps served	55	57	64	58
	Natural Gas				
Southern High Plains	Million of	371.14	854.44	1057.06	702.88
	Pumps served	293	281	379	488
* Majority of pumps operating from surface supplies.					
Total for Colorado	Million KWH	103.99	189.48	212.29	122.13
	Million of	434.57	1143.61	1746.25	1037.52
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SUMMARY OF CHANGES IN GROUND-WATER LEVELS
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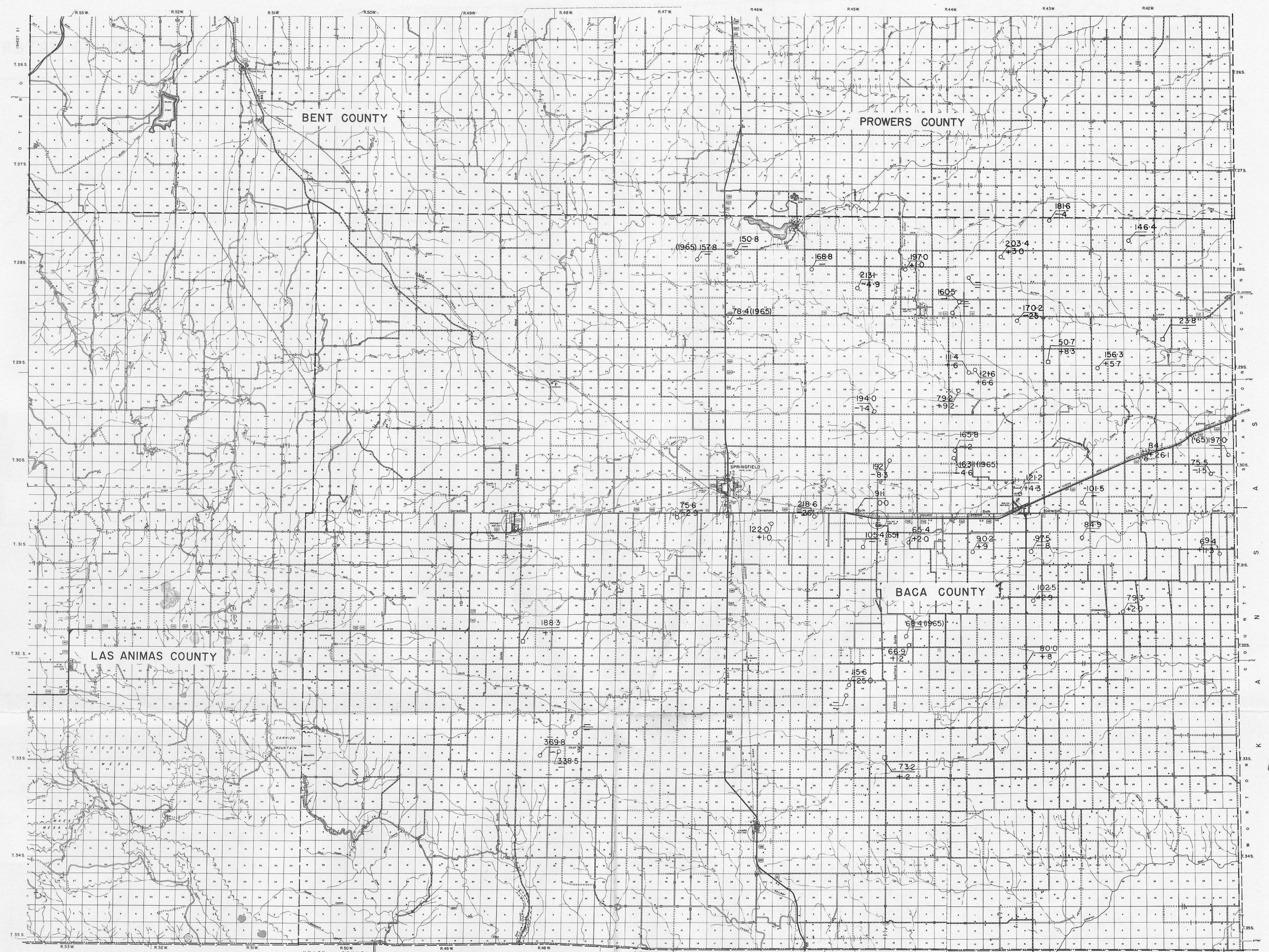
ARKANSAS RIVER BASIN	
Bent County (24 observation wells)	Generally up 1 to 5 feet. One well up 13 feet.
Crowley County (3 observation wells)	Up as much as 1-1/2 feet.
El Paso County (16 observation wells)	Black Squirrel Creek: Steady to up 3-1/2 feet. Jimmy Camp Creek: Up 2 feet. Fountain Creek: Generally up 1 to 4 feet.
Huerfano County (5 observation wells)	Generally steady, down 1/2 foot to up 3 feet.
Otero County (28 observation wells)	Generally up 1 to 5 feet.
Prowers County (8 observation wells)	Generally up to 3 feet.
Pueblo County (20 observation wells)	Fountain Creek: Up 1/2 to 1 foot. Main stem of Arkansas River: Generally up 1 to 6 feet.



SAN LUIS VALLEY



HUERFANO COUNTY



SOUTHERN HIGH PLAINS

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1966

SUMMARY OF CHANGES IN GROUND-WATER LEVELS
 SPRING 1966 COMPARED TO SPRING 1965

- | | |
|---|---|
| <p>SAN LUIS VALLEY</p> <p><u>Alamosa County</u> (12 observation wells)
 All wells up 2 to 3 feet, water table very near the surface - 3 to 5 feet in many areas.</p> <p><u>Conejos County</u> (15 observation wells)
 Romeo area - up 2-1/2 feet
 La Jara area - up 2-1/2 to 4-1/2 feet.</p> <p><u>Costilla County</u> (7 observation wells)
 Fort Garland-Bianca area - up 1 to 2 feet.
 San Ascacio-Jarosa area - two wells in this area showed declines of 1/2 to 1-1/2 feet, the only declines observed in the Valley this year.
 Other wells were up 1-1/2 to 2-1/2 feet.</p> <p><u>Rio Grande County</u> (18 observation wells)
 South of Monte Vista - up about 7 feet.
 Zinser area - up 2 feet.
 North of Monte Vista - up 7 to 15 feet.</p> <p><u>Saguache County</u> (14 observation wells)
 Center area - Generally up 4 to 18 feet, water table very near the surface - 2-1/2 to 5 feet over most of the area.
 Moffat area - Generally up 2 to 3 feet.</p> | <p>SOUTHERN HIGH PLAINS</p> <p><u>Baca County</u> (52 observation wells)
 Majority of wells showed much less severe changes than in previous years. No general areal pattern of fluctuation, though shallow wells generally showed water level rise, indicating recharge from heavy precipitation.</p> |
|---|---|

Civil Engineering Department
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