

# RECLAMATION

*Managing Water in the West*

**Nebraska-Kansas Area Office**

**Report**

**To The**

**Republican River**

**Compact Administration**

Lincoln, NE



U.S. Department of the Interior  
Bureau of Reclamation  
Great Plains Region  
Nebraska-Kansas Area Office

August 28, 2014

## REPUBLICAN RIVER COMPACT MEETING

August 28, 2014  
Lincoln, Nebraska

### 2013 Operations

As shown on the attached Table 1, precipitation in the Republican River Basin varied from 103 percent of normal at Lovewell Reservoir to 64 percent of normal at Hugh Butler Lake. Total precipitation at Reclamation project dams ranged from 12.63 inches at Red Willow Dam to 28.20 inches at Lovewell Dam.

Inflows varied from 16 percent of the most probable forecast at Bonny Reservoir to 82 percent of the most probable forecast at Harry Strunk Lake. Inflows into Bonny Reservoir totaled 1,780 AF while inflows at Harlan County Lake totaled 48,794 AF.

Average farm delivery values for total irrigable acres were as follows:

<u>District</u>	<u>Farm Delivery</u>
Frenchman Valley	0.0 inches
H&RW	0.0 inches
Frenchman-Cambridge	2.1 inches
Almena	2.7 inches
Bostwick in NE	5.9 inches
Kansas-Bostwick	9.2 inches

### 2013 Operation Notes

**Bonny Reservoir** – Remained empty at elevation 3638.00 feet, 34.0 feet below the top of conservation. The annual computed inflow totaled 1,780 AF and was the lowest ever recorded at this site. Reservoir inflows were bypassed the entire year as ordered by the State of Colorado.

**Note** - The Nebraska Department of Natural Resources declared a Compact Call Year on the Republican River Basin on January 1, 2013 and issued storage closing notices on Reclamation reservoirs in the Basin. All water impounded in Swanson Lake, Enders Reservoir, Hugh Butler Lake and Harry Strunk Lake from January 1<sup>st</sup> through April 30<sup>th</sup> was released by May 15, 2013. Water impounded after April 30<sup>th</sup> was considered legally stored by DNR on December 31, 2013, under the corresponding water right.

**Enders Reservoir** – Started the year at elevation 3090.71 feet, 21.6 feet below the top of conservation. The 2013 computed inflow totaled 4,126 AF. The reservoir level increased only slightly to a peak elevation of 3091.22 feet on March 31<sup>st</sup>. A total of 566 AF was released in April and May for compact compliance. Due to the extremely low available water

supply, no water was released from Enders Reservoir for irrigation. This was the twelfth consecutive year that H&RW Irrigation District did not divert water. It was also the tenth consecutive year that storage releases were not made for Frenchman Valley Irrigation District. The end of the year reservoir level was 23.8 feet (3088.55 feet) below the top of conservation.

**Swanson Lake** – Started the year at elevation 2732.41 feet, 19.6 feet below the top of conservation. The annual computed inflow totaled 19,498 AF. This includes approximately 11,000 AF from the Rock Creek augmentation project. A total of 7,292 AF was released to the river in April and May for compact compliance. A peak elevation of 2734.19 feet (17.8 feet below the top of conservation) was reached on May 2<sup>nd</sup>. The reservoir level decreased during the irrigation season reaching elevation 2729.51 feet on August 30<sup>th</sup>. The district diverted 9,210 AF into Meeker-Driftwood Canal from June 26<sup>th</sup> through August 30<sup>th</sup>. At the end of the year the reservoir level was 22.6 feet below the top of conservation at 2729.45 feet.

**Hugh Butler Lake** – Started the year at elevation 2553.63 feet, 28.2 feet below the top of conservation. The 2013 computed inflow was 8,735 AF. The reservoir level gradually increased to a peak elevation of 2556.81 feet on April 2<sup>nd</sup>. A total of 4,315 AF was released from the reservoir in April and May for compact compliance. No irrigation releases were made from Hugh Butler Lake in 2013. The elevation at the end of the year was 2555.06 feet, 26.7 feet below the top of conservation.

**Harry Strunk Lake** – Started the year at elevation 2355.97 feet, 10.1 feet below the top of conservation. The annual computed inflow totaled 31,563 AF. The reservoir level gradually increased to elevation 2361.81 feet on April 2<sup>nd</sup>. A total of 10,902 AF was released in April and May for compact compliance. Irrigation releases dropped the reservoir level to elevation 2349.87 feet on September 2<sup>nd</sup>. The district diverted 12,575 AF into Cambridge Canal. Late fall and early winter inflows increased the level of Harry Strunk Lake to 9.8 feet below the top of conservation at the end of the year (2356.34 feet).

**Keith Sebelius Lake** – Started the year at elevation 2293.97 feet, 10.3 feet below the top of conservation. The total 2013 computed inflow was 4,705 AF. The reservoir level slowly increased to an elevation of 2294.63 feet on May 19<sup>th</sup>. Irrigation releases were made during June and July reducing the lake level by 2.6 feet. The reservoir level continued to gradually decrease the remainder of the year and ended at an elevation of 2290.78 feet (13.5 feet below the top of conservation). A total of 2,274 AF was diverted into Almena Canal.

**Harlan County Lake** – Started the year at elevation 1935.28 feet, 10.5 feet below the top of conservation. The 2013 computed inflow totaled 48,794 AF. This includes the water that was bypassed from the upstream reservoirs. A total of 7,765 AF was released from the reservoir in May for compact compliance. The lake level peaked at elevation 1937.55 feet on June 12<sup>th</sup>. Irrigation releases started June 12<sup>th</sup> and continued through September 10<sup>th</sup> decreasing the pool level to elevation 1930.09 feet. Bostwick Irrigation District in Nebraska diverted 24,476 AF in 2013. Kansas Bostwick Irrigation District entered into an Excess Capacity Contract (Warren Act Authority) with Reclamation for the use of “Compact Call” water stored in Harlan County Lake in 2013. A total of 5,500 AF was released under this contract during the irrigation season and an additional 10,098 AF was released in November and December. The reservoir elevation was 1927.85 feet (17.9 feet below the top of conservation) on December

31, 2013. A ten year summary of Harlan County Lake operations is shown on Table 3.

**Lovewell Reservoir** – Started the year at elevation 1577.60 feet, 5.0 feet below the top of conservation. The annual computed inflow total for 2013 was 47,037 AF. Republican River diversions were made via the Courtland Canal into Lovewell Reservoir from January through mid-April and resumed in early May. The pool level gradually increased to elevation 1584.11 feet on June 5<sup>th</sup>. Releases to the canal began on June 3<sup>rd</sup> and continued through September 11<sup>th</sup>. The reservoir elevation at the end of the irrigation season was 1572.02 feet. Republican River flow was diverted via Courtland Canal into Lovewell Reservoir from late November through the end of December. The Kansas Bostwick Irrigation District diverted a total of 60,232 AF in 2013. A total of 40,139 AF was released into Courtland Canal from Lovewell Reservoir. The reservoir level at the end of the year was 1577.56 feet (5.0 feet below top of conservation).

### Current Operations (As of 7/31/14)

**Bonny Reservoir** – The reservoir is currently empty. Inflows continue to be bypassed through the reservoir as ordered by the State of Colorado. Approximately 596 AF has been released into Hale Ditch in 2014. Bonny Dam has recorded 13.43 inches of precipitation during the first seven months of the year (115% of average).

**Note** - The Nebraska Department of Natural Resources declared a Compact Call Year on the Republican River Basin on January 1, 2014 and issued storage closing notices on Reclamation reservoirs in the Basin. The compact call remains in place.

**Enders Reservoir** - The reservoir level is 29.9 feet below full and 7.3 feet below last year at this time. Enders Dam recorded 13.48 inches of precipitation during the first seven months of the year (104% of normal). Due to the water supply shortage, H&RW Irrigation District is not irrigating for the thirteenth year in a row. This is also the eleventh consecutive year that Frenchman Valley Irrigation District has not received storage water for irrigation. In May of 2014, 4,380 AF of storage water was reassigned to the Kansas Bostwick Irrigation District and subsequently diverted from the reservoir. This reassignment resulted from an agreement reached by the Frenchman Valley and H&RW Irrigation Districts with the Middle Republican Natural Resource District to release the water for compact compliance.

**Swanson Lake** – The lake level is 23.6 feet from full and is 2.8 feet below last year at this time. Precipitation for the year is at 94% of normal (12.65 inches). Irrigation releases made in 2014 have been significantly reduced as a result of the compact call placed on the Republican River by the Nebraska Department of Natural Resources.

**Hugh Butler Lake** – The lake level is currently 26.7 feet below full and is 1.1 feet above last year at this time. The precipitation total so far this year is 12.10 inches (94% of normal). Irrigation releases are not being made from Hugh Butler Lake this season.

**Harry Strunk Lake** – The lake level is currently 8.6 feet below the top of conservation.

Precipitation at the dam during the first seven months of the year was 17.61 inches (128% of normal). Irrigation releases have been limited during 2014 due to the compact call. The lake level is currently 3.0 feet above last year at this time.

**Keith Sebelius Lake** – Currently 15.4 feet below full. Lake level is 2.7 feet below last year at this time. Irrigation releases were limited during 2014 due to a short water supply. Precipitation at the dam during the first seven months of the year was 13.91 inches (86% of normal).

**Harlan County Lake** – The current water surface level is approximately 13.2 feet below full. The lake level is 0.7 feet below last year at this time. Harlan County Dam has recorded 11.26 inches of precipitation so far this year (76% of normal). Only 6,130 AF of project water was available for irrigation on June 30, 2014. An additional 52,800 AF of water was available for Kansas Bostwick Irrigation District use as a result of the district entering an Excess Capacity Contract (Warren Act Authority) with Reclamation. It was determined that “Water-Short Year Administration” would be in effect.

**Lovewell Reservoir** – The reservoir level is currently 4.1 feet below the top of conservation and 0.7 feet above last year’s elevation at this time. Lovewell Dam recorded 17.49 inches of precipitation during the first seven months of the year (102% of average). Irrigation demands were low in late June due to the wet and cool conditions in the district.

A summary of data for the first seven months of 2014 is shown on Table 2.

### Other Items

**Excess Capacity Contract** – Harlan County Lake – An Excess Capacity Contract (Contract) was executed with Kansas Bostwick Irrigation District (KBID) to temporarily store inflows into Harlan County Lake under the State of Nebraska’s Compact Call water right administration. This contract allowed water to be temporarily stored for KBID’s use during the irrigation season. All of the water remaining under this Contract at the end of the 2013 irrigation season was later released under the direction of KBID for diversion into Lovewell Reservoir. A similar Contract was executed for 2014 as a result of Nebraska’s 2014 Compact Call.

**Conservation Committee** – Impacts of Non-Federal Reservoirs and Land Terracing on Basin Water Supplies – A final study report, dated June 2014, was transmitted to the Republican River Compact Administration (RRCA) members in July 2014. This study was approved by the RRCA on July 27, 2014 and completed on their behalf.

**Safety of Dams** – Red Willow Dam – Reconstruction related to the Safety of Dams Modification at Red Willow Dam was substantially completed in December 2013. Construction and repair operations began in December 2011 of a filter and drainage blanket along the downstream embankment and installation of a new toe drain system. In addition, the contract was modified to include stabilizing the access road, paving the dam crest and

repaving the access road.

**WaterSMART Basin Study Program** - The States of Colorado, Nebraska, and Kansas and the U.S. Department of the Interior, Bureau of Reclamation are continuing work on the Republican River Basin Study. Both Nebraska and Kansas are currently completing ground and surface water models in the basin and finalizing model calibrations. The study team agreed to extend the study by one year, so the final report will be completed in November 2015 instead of November 2014. All of the analyses, including model runs of alternatives, climate change analysis, and economics analysis, will be completed by the end of the calendar year, leaving 2015 to evaluate findings and completion of the final report.

**TABLE 1**  
**NEBRASKA-KANSAS PROJECTS**  
**Summary of Precipitation, Reservoir Storage and Inflows**  
**CALENDAR YEAR 2013**

Reservoir	Total Precip. Inches	Percent Of Average %	Storage 12-31-12 AF	Storage 12-31-13 AF	Gain or Loss AF	Maximum Content AF	Storage Date	Minimum Content AF	Storage Date	Total Inflow AF	Percent Of Most Probable %
Box Butte	17.14	101	8,308	8,807	499	12,981	MAY 19	5,705	AUG 29	10,096	62
Merritt	20.92	102	61,370	60,831	-539	67,602	MAY 23	42,929	SEP 13	184,211	100
Calamus	25.08	104	87,136	100,449	13,313	123,054	APR 15	61,540	SEP 23	258,881	94
Davis Creek	28.42	115	18,954	9,501	-9,453	31,812	MAY 30	9,320	SEP 30	47,965	125
Bonny	14.02	82	0	0	0	0	N/A	0	N/A	1,780	16
Enders	15.26	80	15,122	13,320	-1,802	15,573	MAR 31	13,153	NOV 3	4,126	43
Swanson	15.71	79	37,797	28,877	-8,920	41,665	MAY 2	27,376	NOV 3	19,498	64
Hugh Butler	12.63	64	6,098	6,961	863	8,094	APR 2	5,764	MAY 15	8,735	62
Harry Strunk	17.79	86	19,939	20,382	443	27,617	APR 2	13,447	SEP 2	31,563	82
Keith Sebelius	20.90	85	16,462	12,502	-3,960	17,372	MAY 19	12,468	NOV 28	4,705	53
Harlan County	17.46	77	191,125	124,522	-66,603	215,031	JUN 12	124,523	DEC 31	48,794	35
Lovewell	28.20	103	22,585	22,495	-90	40,349	JUN 5	12,127	SEP 11	47,037	69
Kirwin	17.77	75	66,348	50,011	-16,337	72,279	MAY 19	49,942	DEC 6	13,132	39
Webster	19.28	81	36,167	16,537	-19,630	37,236	MAY 19	16,505	DEC 7	5,120	19
Waconda	21.22	83	184,545	187,122	2,577	200,660	AUG 7	185,103	JAN 1	60,291	34
Cedar Bluff	16.08	77	66,233	54,342	-11,891	66,365	JAN 2	54,343	DEC 30	5,605	30

**TABLE 2**  
**NEBRASKA-KANSAS AREA OFFICE**  
**Summary of Precipitation, Reservoir Storage and Inflows**

**JANUARY - JULY 2014**

Reservoir	Precip. Inches	Percent Of Average %	Storage 7/31/2013 AF	Storage 7/31/2014 AF	Gain or Loss AF	Inflow AF	Percent Of Most Probable %
Bonny	13.43	115	0	0	0	1,782	24
Enders	13.48	104	14,283	8,961	(5,322)	4,287	82
Swanson	12.65	94	33,333	26,312	(7,021)	25,124*	110
Hugh Butler	12.10	94	6,274	6,961	687	6,828	76
Harry Strunk	17.61	128	18,240	21,758	3,518	35,471*	144
Keith Sebelius	13.91	86	13,379	10,474	(2,905)	3,052	51
Harlan County	11.26	76	170,539	164,168	(6,371)	73,703**	83
Lovewell	17.49	102	23,062	24,627	1,565	27,323	64

\* Includes inflow from augmentation (pumping) projects.

\*\* Includes the water bypassed from the upstream reservoirs.

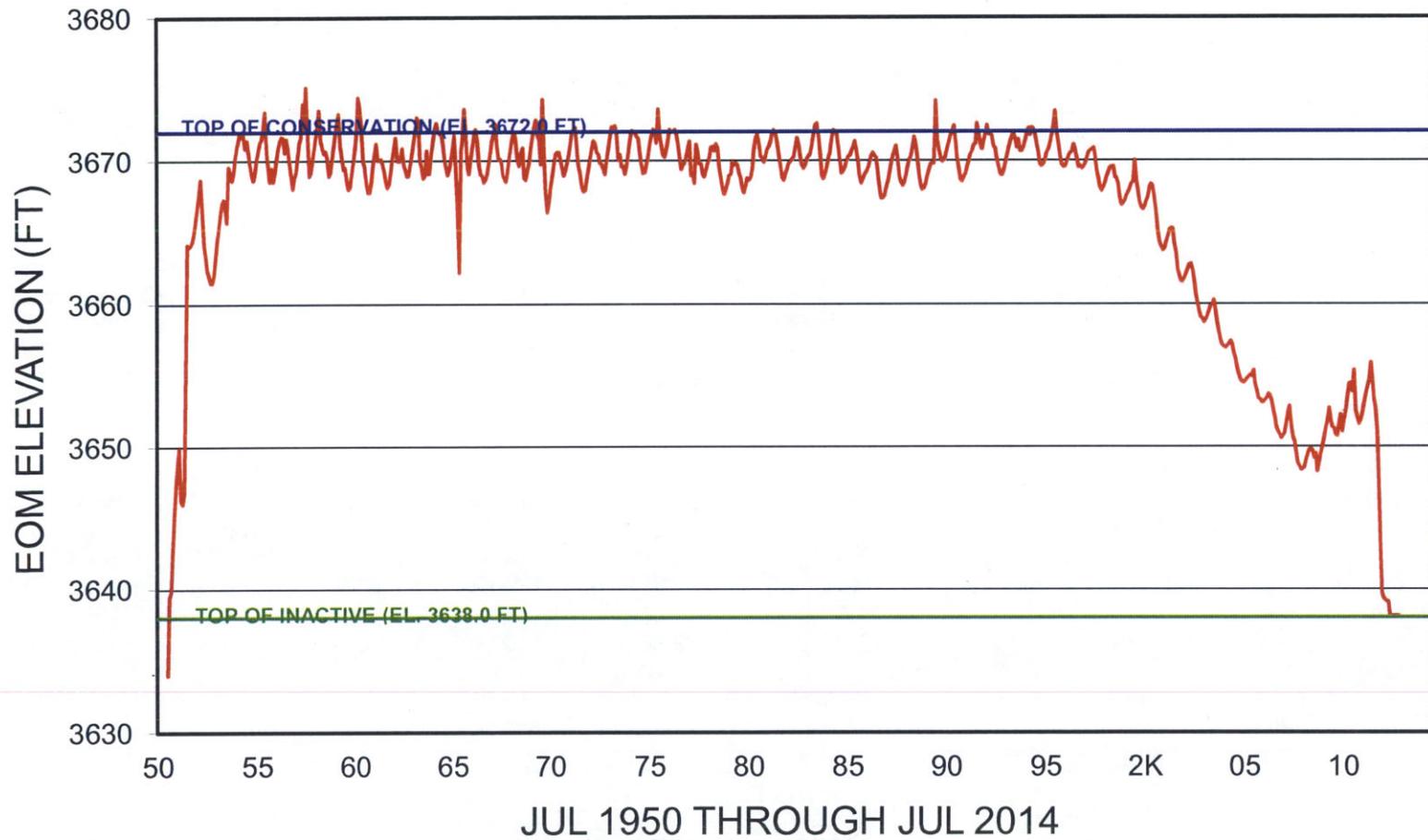
**TABLE 3  
HARLAN COUNTY LAKE**

Year	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	Precip. (% of Average) (22.76 inches)	Rep. Basin Reclamation Dams (% of Average)	End of Year Content (AF)	Projected Irrig. Water Supply On June 30th (AF)
2004	25,099	0	30,601	22.83	100%	111%	107,050	0
2005	53,682	0	32,620	22.51	99%	107%	128,111	14,100
2006	30,077	12,280	29,609	20.62	91%	101%	116,299	14,400
2007	198,528	21,237	38,197	26.92	118%	114%	255,393	111,700
2008	224,841	114,938	45,985	30.31	133%	131%	319,311	175,900
2009	136,747	94,079	41,721	24.50	108%	128%	320,258	156,000
2010	239,054	194,055	46,893	31.66	139%	119%	318,364	147,800
2011	174,830	120,989	49,241	30.69	135%	115%	322,964	157,700
2012	78,581	160,221	50,199	18.14	80%	64%	191,125	132,900
2013	48,794	75,355	40,042	17.46	77%	83%	124,522	81,400*

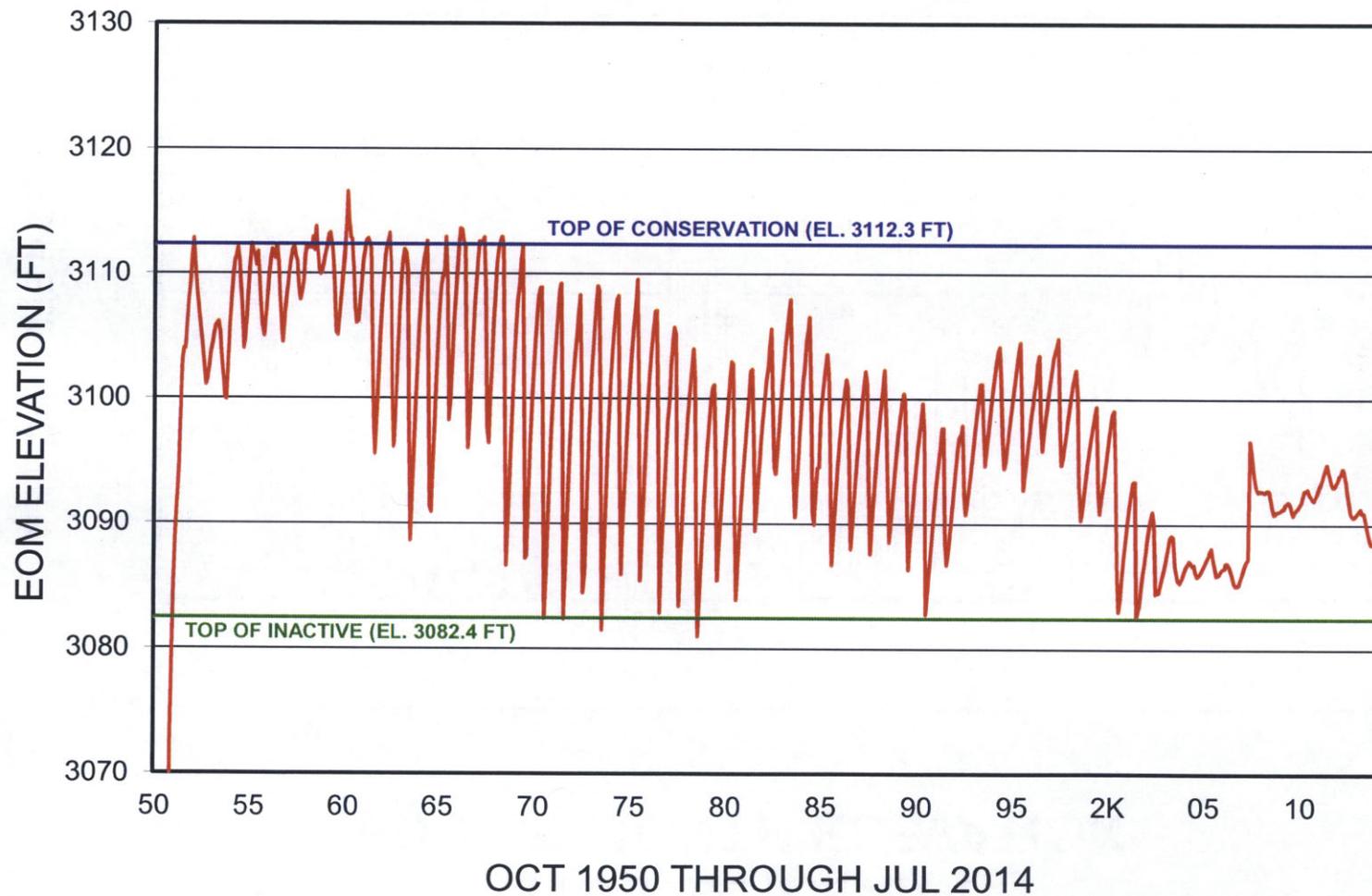
\* Includes 54,400 AF of project water and 27,000 AF of water stored under an Excess Capacity Contract with KBID.

\*\*NOTE: On June 30, 2014, the Projected Irrig. Water Supply included 6,130 AF of project water and 52,840 AF of water stored under an Excess Capacity Contract with KBID.

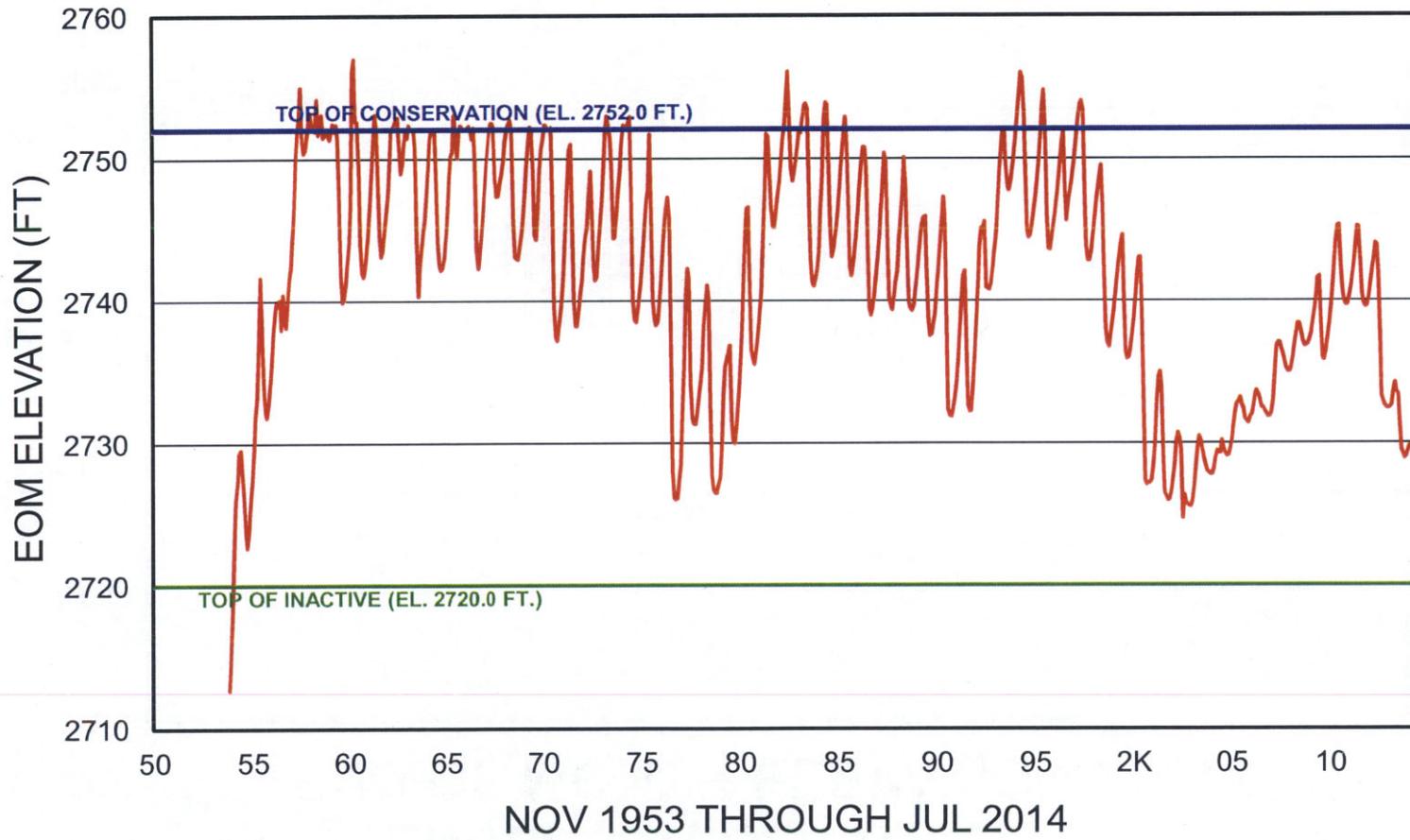
# BONNY RESERVOIR END OF MONTH ELEVATION



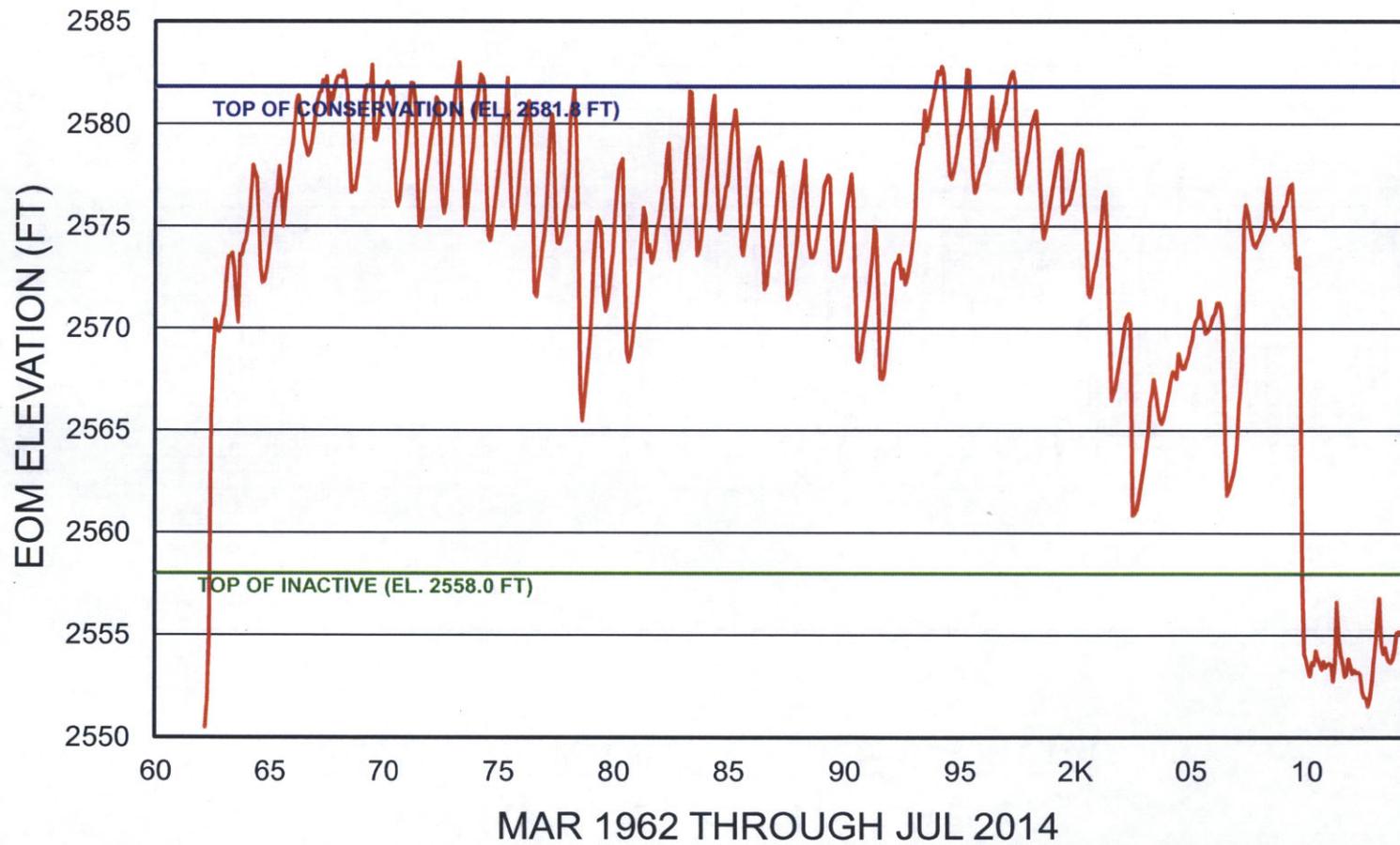
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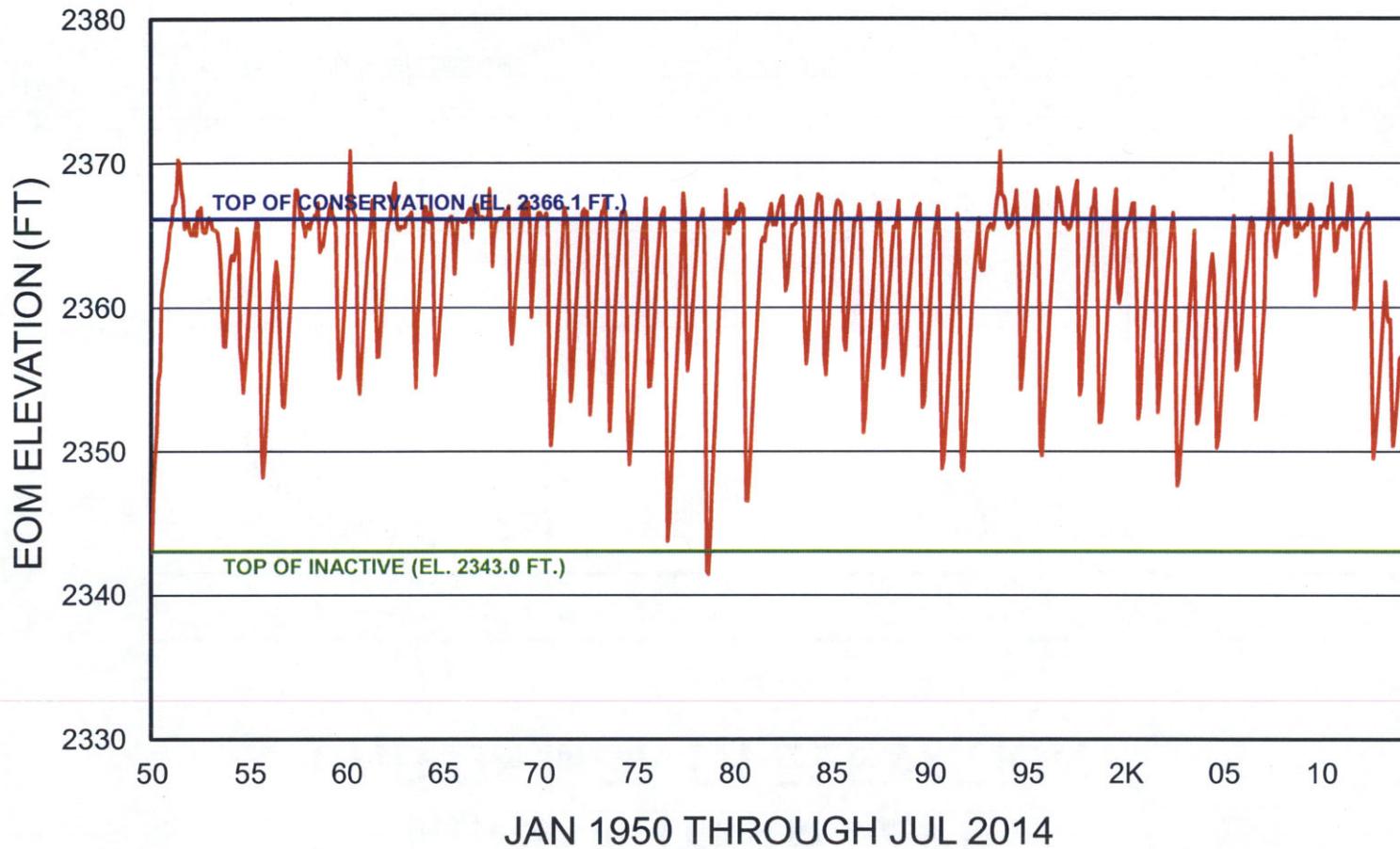
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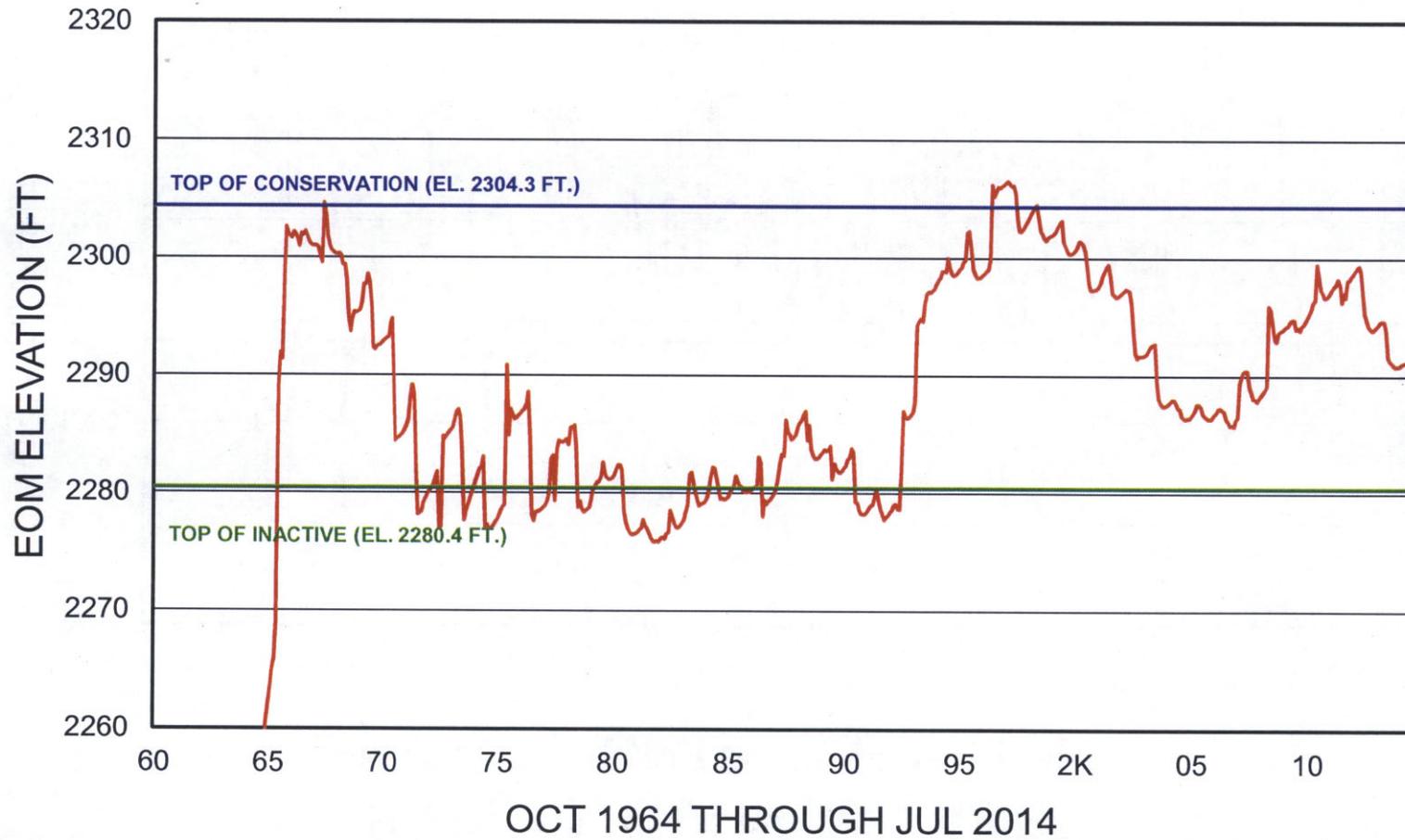
# HUGH BUTLER LAKE END OF MONTH ELEVATION



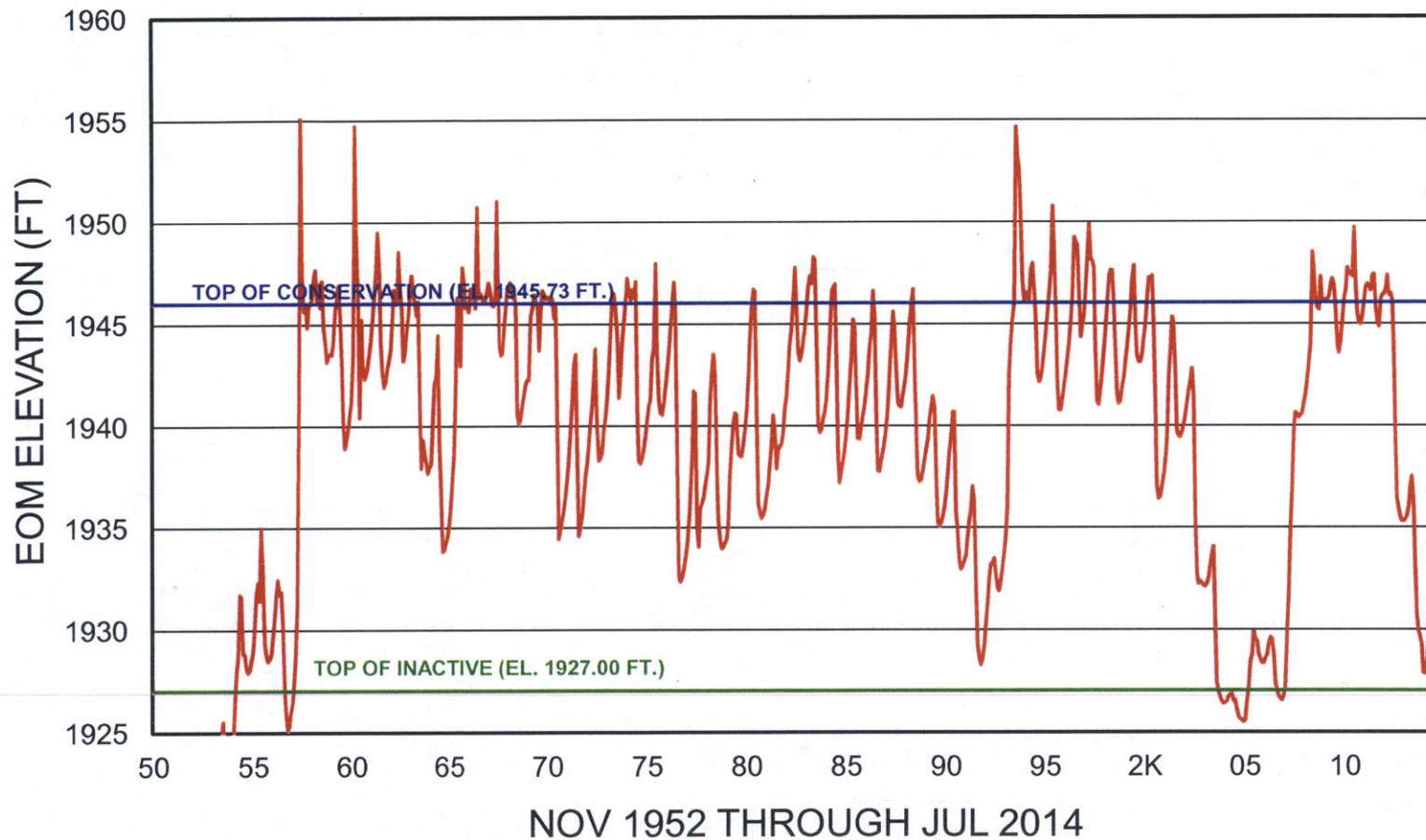
# HARRY STRUNK LAKE END OF MONTH ELEVATION



# KEITH SEBELIUS LAKE END OF MONTH ELEVATION



# HARLAN COUNTY LAKE END OF MONTH ELEVATION



# LOVEWELL RESERVOIR END OF MONTH ELEVATION

