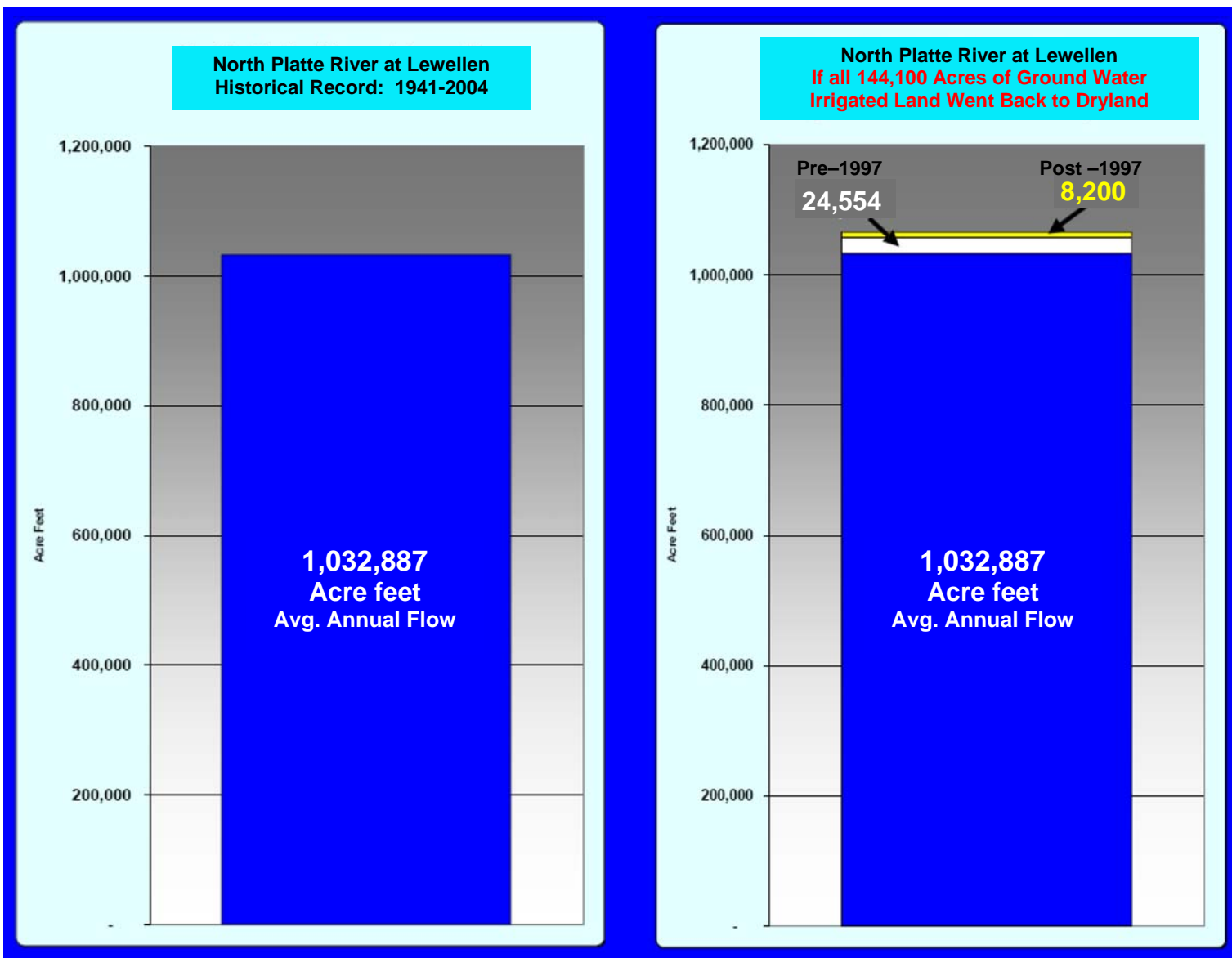




**Conclusions presented at the  
Nebraska Association of Resources Districts  
Fall Conference - September 25, 2007  
based on data from the Cooperative Hydrology  
Study (COHYST), NDNR and USGS.**

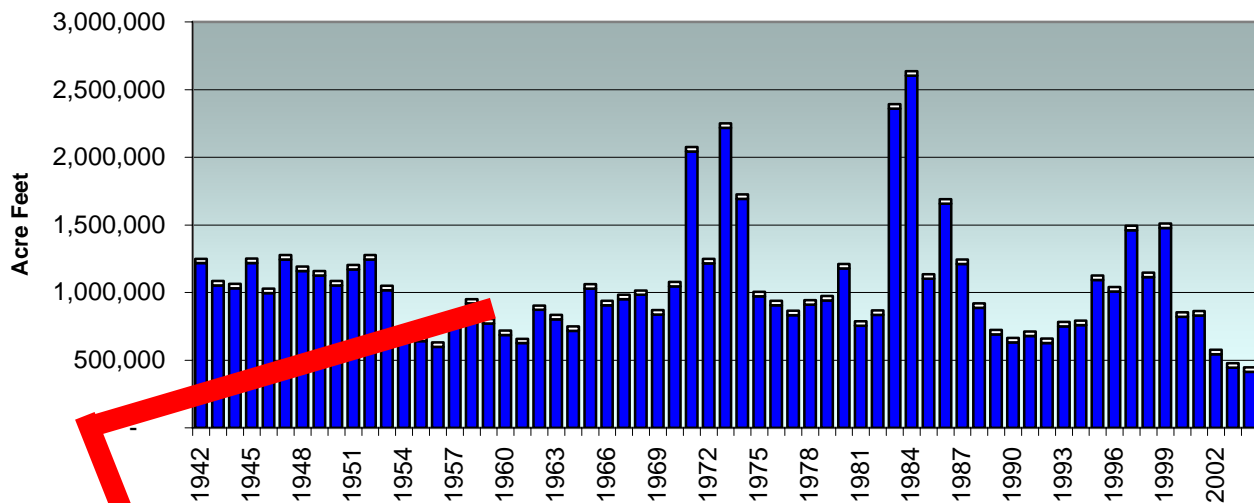
The Cooperative Hydrology Study (COHYST) began in 1998 to determine the hydrologic connection between ground water and surface water in the Platte River Basin from Columbus to Scottsbluff. This study was sponsored by these agencies: Central Platte NRD, Little Blue NRD, North Platte NRD, South Platte NRD, Tri-Basin NRD, Twin Platte NRD, Upper Big Blue NRD, Central Nebraska Public Power & Irrigation District, Nebraska Public Power District, Nebraska Game & Parks Commission, and the Nebraska Department of Natural Resources.



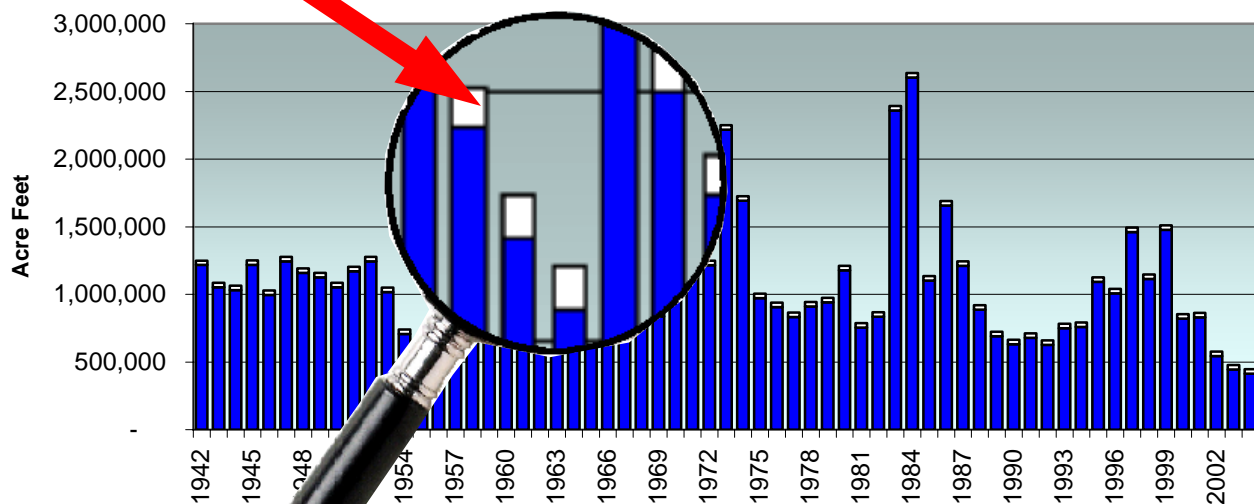
The graphs refer to the North Platte River gauge at Lewellen, which is just upstream of Lake McConaughy. The graph above shows a 24,554 acre feet addition to North Platte River flows if all 128,800 ground water acres developed between the Wyoming line and Lewellen prior to July 1, 1997, go back to dryland. If all 15,300 ground water acres developed in the same reach after July 1, 1997, also go back to dryland, 8,200 more acre feet would be added to the North Platte River flows. The results?: 32,754 acre foot gain by retiring 144,100 acres of ground water irrigated land. *In other terms, the 24,554 acre-feet flow is 2.4% of the average flow, which is 1,032,887 acre-feet per year. The 8,200 acre-feet is 0.08% of the average annual flow. The most accurate gauge has a 5% error. The projected flow changes are less than the error in the gauge.*

*These graphs show the estimated increased annual flows by shutting down ground water irrigation (32,754 acre-feet). The white portion is the increased flow if all 144,100 ground water acres above Lake McConaughy were retired and converted to dryland. The blue portion is the annual flows coming into Lake McConaughy since 1942 (1,032,887 acre-feet average per year). This is projected to increase flows by 3%.*

**North Platte River at Lewellen with 100% Reduction in Ground Water Irrigated Land**



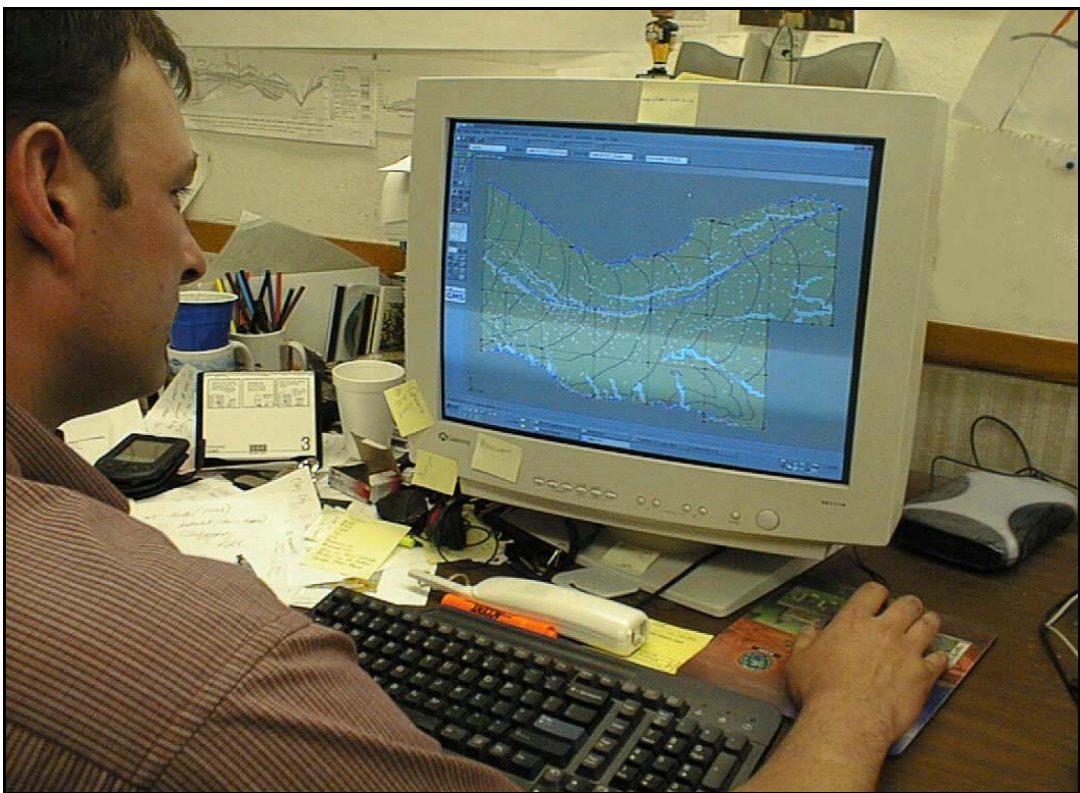
**North Platte River at Lewellen with 100% Reduction in Ground Water Irrigated Land**



*This magnifies the white additions in the previous graph so you can see the change.*

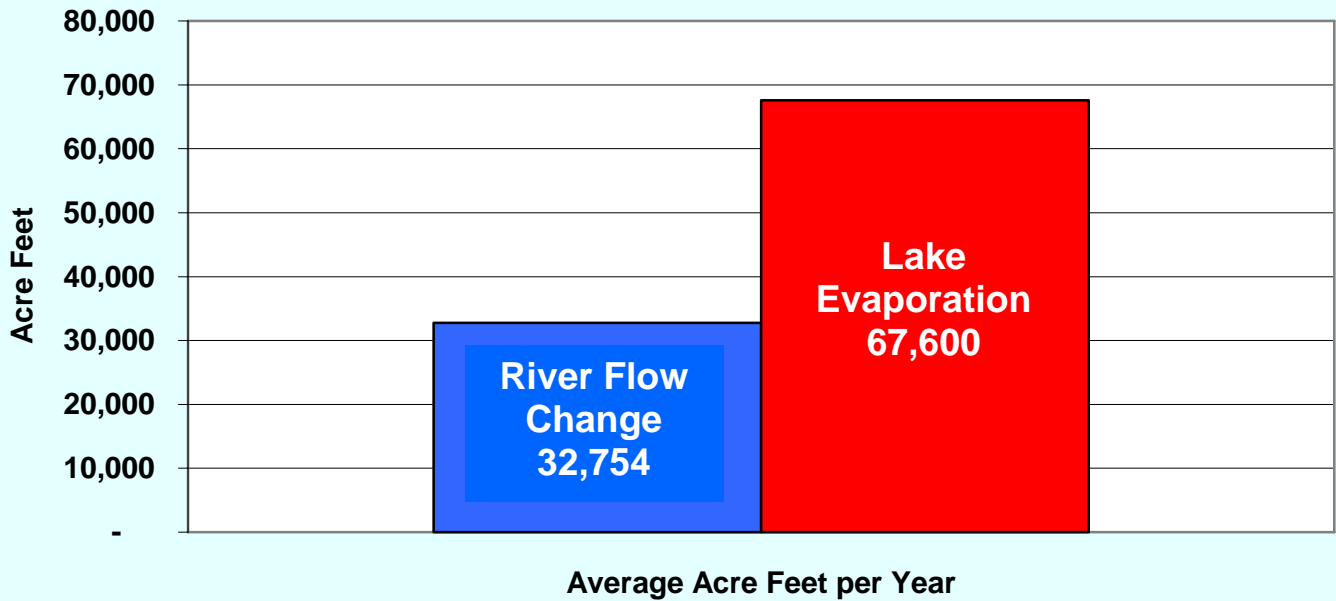


Stream gauges are calibrated with depth and velocity measurements to determine flow rates. This picture was taken near Lewellen, Nebraska, upstream of Lake McConaughy.

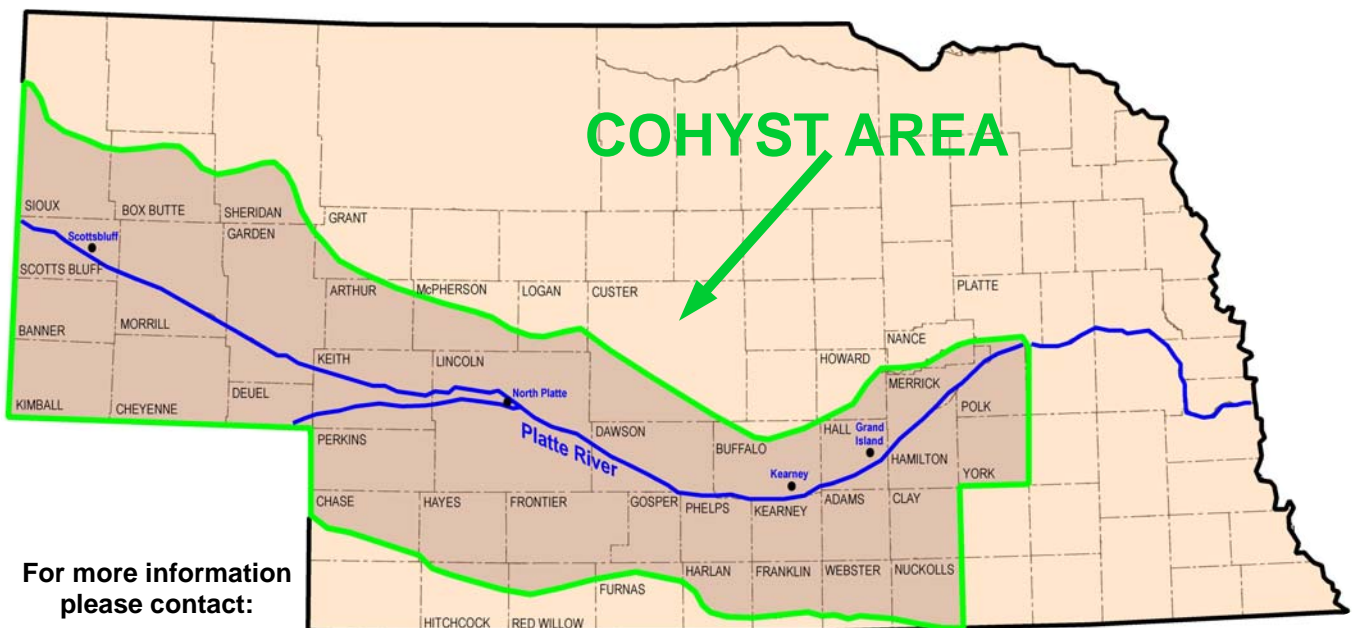


Computer models are used to simulate groundwater systems. Pictured on screen at this computer is a map of a portion of the COHYST area.

**North Platte River Flow Change  
compared to  
Evaporation from Lake McConaughy  
(1950 - 1998 average)**



*The graph above shows the increased flows if all the ground water irrigated acres are shut down (144,100) and compares it to the average annual evaporation of the water out of Lake McConaughy. The average loss of water through evaporation on the Lake is more than double any increased flow to the lake via shutting down all ground water irrigation. Another way to look at it is the impact to stream flow to irrigate 144,100 acres above Lake McConaughy is one-half the evaporation loss to store irrigation water for 100,000 acres.*



**For more information  
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