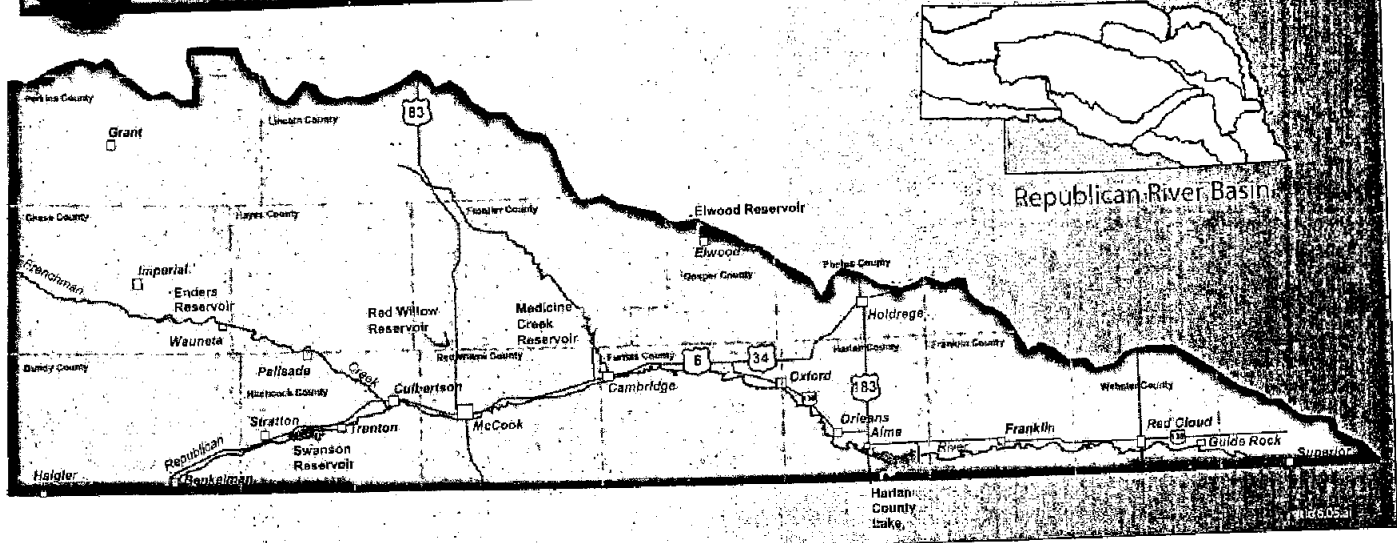


NEBRASKA
Water Policy Task Force

WATER POLICY TASK FORCE REPUBLICAN RIVER BASIN WATER TOUR

August 2nd & 3rd, 2005



Agenda
Water Policy Task Force Republican Valley Tour
August 2 and 3, 2005

Tuesday, August 2nd, 2005

- 9:00 – 11:45 **Holdrege**
Water Policy Task Force, Executive Committee Meeting –Holdrege – Phelps County Ag Center – 1308 2nd Street, Middle Room
- 11:45 – 12:45 Lunch/Overview of Tour, Briefing on Republican River Compact – Phelps County Ag Center - Roger Patterson, Director and Ann Bleed Deputy Director Nebraska Department of Natural Resources / Dave Cookson, Attorney General's Office
- 12:45 - 2:15 **Leave Holdrege - Travel to McCook**

Presentations by TriBasin, John Thorburn, Manager and MRNRD, Dan Smith, Manager in route. Presentation by Greg Reisdorff, USDA, Farm Service Agency on CREP in route.
- 2:15 – 2:45 **McCook**
Tour new Bureau of Reclamation Office & Control Center (Overview of Republican Basin Reservoir Operations) Alice Johns, Area Manager, Nebraska-Kansas Area Office, and Marv Swanda, Manager McCook Office, Bureau of Reclamation
- 2:45 – 3:00 Travel to Fairgrounds Building
- 3:00 – 4:00 Meet with Governor Dave Heineman (Fairgrounds Building)
- 4:00 - 4:30 **Leave McCook - Travel to Trenton**
Presentations en-route by Jasper Fanning, Manager, Upper Republican Natural Resources District and Don Felker, Manager Frenchman Valley and H&RW Irrigation Districts in route
- 4:30 - 5:30 Tour Agri Products Ethanol Plant – Briefing by Plant Officials and Presentation by Todd Sneller, Administrator, Nebraska Ethanol Board on Ethanol in Nebraska
- 5:30 - 6:00 Travel to and view Swanson Reservoir
- 6:00 - 7:00 BBQ Dinner (Trenton Community room)
- 7:30 **Leave Trenton – Travel to McCook**
Lodging at Holiday Inn Express in McCook

Wednesday, August 3rd, 2005

- 8:00- 8:45 **Leave McCook - Travel to Medicine Creek Reservoir**
Presentation on McCook wellfield, John Bingham, McCook City Manager in route
- 8:45- 9:10 Visit Medicine Creek Reservoir – Presentations by Bureau of Reclamation and
by Roger Stockton, Southwest Nebraska RC&D
- 9:10- 9:30 **Leave Medicine Creek Reservoir - Travel to Cambridge Diversion Dam –**
Presentation by Roy Patterson, Manager, Frenchman Cambridge Irrigation District in
route
- 9:30-9:45 Refreshments at Cambridge Diversion Dam
- 9:45-11:00 **Leave Cambridge Diversion Dam - Travel to Alma**
Presentation on Water Administration by Brad Edgerton Cambridge Office in route.
Presentation by Mike Clements, Manager, Lower Republican NRD in route. Cross
river and view lake
- 11:00-11:30 Presentation on Harlan County Lake Operations – Corps of Engineers Representative
and Bostwick Irrigation District Operations – Mike Delka, Manager, Nebraska Bostwick
Irrigation District – at Johnson Center, Alma
- 11:30-12:40 Lunch – Johnson Center, Alma
- 12:40 - 1:00 Load Bus and Travel to Dam
- 1:00 - 2:30 Tour Harlan County Dam
- 2:30 - 3:30 Break & Meet at Johnson Center in Alma (Senator Schrock)
- 3:30 - 4:15 **Leave Alma - Return to Holdrege – Tour Ends**

August 2nd & 3rd, 2005

NEBRASKA WATER POLICY TASK FORCE Water Policy Task Force REPUBLICAN RIVER BASIN WATER TOUR

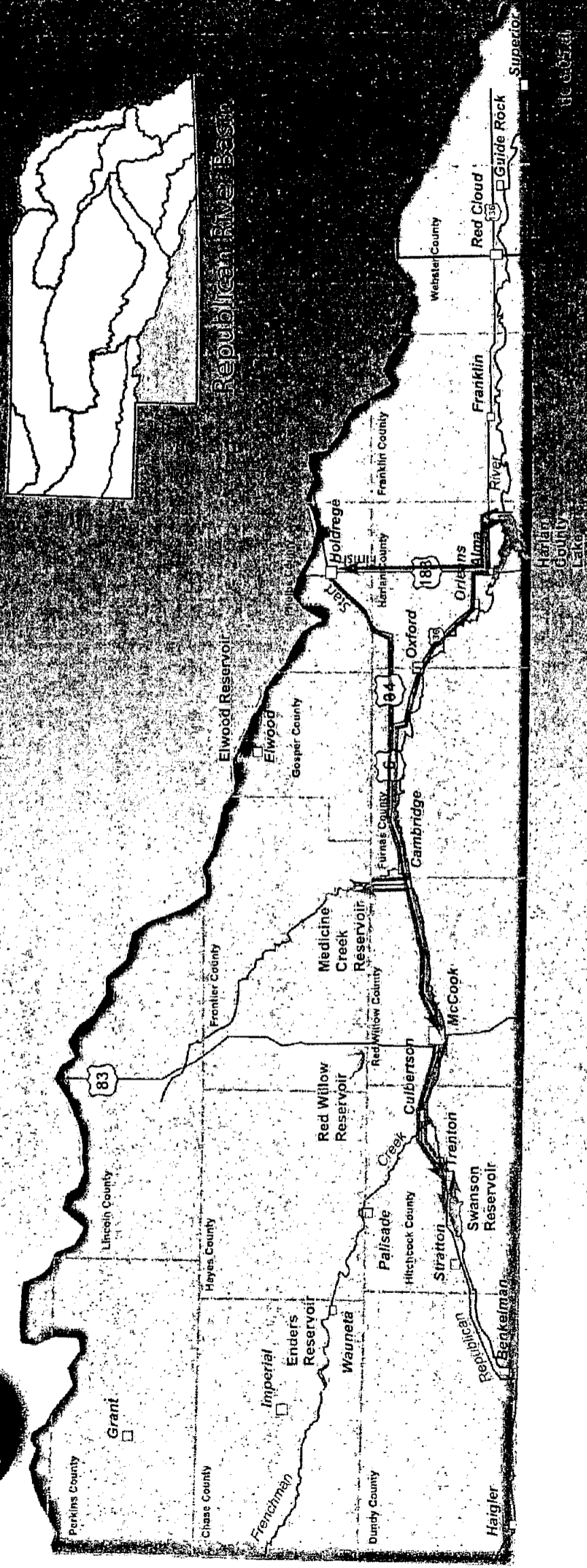


TABLE OF CONTENTS
INFORMATION BOOKLET
WATER POLICY TASK FORCE TOUR
AUGUST 2-3, 2005

Page

- 1 - Itinerary / Agenda**
 - 3 - Tour Map**
 - 5 - Table of Contents**
 - 7 - Registration List**
 - 9 - Water Policy Task Force Members**
-

Day 1 Holdrege / McCook / Trenton / McCook

- 15 - Republican River Basin in Nebraska
 - 17 - Line Diagram of Republican River Designated Drainage Basins
 - 19 - Streamflow Graphs
 - 39 - Harlan Reservoir Elevation/Contents Graphs
 - 43 - Registered Irrigation Wells in Republican Basin Over Time (Graph)
 - 45 - Registered Irrigation Wells in Republican Basin (Map)
 - 47 - New Irrigation Wells per Year 1993-2004 by NRD
 - 49 - New Irrigation Wells in 2004 by NRD
-
- 51 - Groundwater Pumping and Streamflow
-
- 55 - Republican River Settlement Brochure
 - 57 - Powerpoint Slides on Republican River Compact
 - 71 - Alluvial/Upland Wells
 - 73 - Gross Irrigation Requirement
 - 75 - Annual Virgin and Computed Water Supply, Allocations and Computed Beneficial Consumptive Use
 - 77 - Five Year Average Allocations – Colorado, Kansas and Nebraska
 - 79 - Republican River Compact
 - 85 - Republican River Basin / Subbasin Map
 - 87 - Surface and Groundwater Depletions Graph
 - 89 - Allocations versus Consumptive Use Graph
 - 91 - Lag Effect Graph
 - 93 - Graphs of Inches Delivered to Farms from Surface Water Projects Compared to NRD Allocations
-

101 - Tri-Basin NRD Newsletter – Tri-Basin Topics, Spring 2005

105 - Republican Flood of 1935 Material

107 - Ethanol Information

**Day 2 McCook / Medicine Creek Reservoir / Cambridge Diversion Dam / Harlan
County Lake / Alma / Holdrege**

117 - "*Water 'Rights'*" – 7/10/05 Editorial from Omaha World Herald

WPTF TOUR, Aug. 2&3, 2005	
EXPECTED ATTENDEES	
Ambrosek, Robert	
Ambrosek, Robert, Mrs.	
Baker, Tom (SENATOR)	
Barels, Brian	WPTF
Beethe, Lisa	
Benson, Lorrie	WPTF
Best, Ralph	
Bleed, Ann	
Burkholder, John	
Cappel, Claude	WPTF
Clements, Mike	
Coady, James	WPTF
Connealy, Matt (SENATOR)	
Diers, Ann	
Eberle, Nancy	WPTF
Edgerton, Brad	
Edson, Dean	
Erickson, Gloria	
Fanning, Jasper	
Felker, Don	
Friesen, Curt	WPTF
Friesen, Mrs. Curt	
Gaul, Steve	
Glock, Eugene	WPTF
Heidemann, Lavon (SENATOR)	
Heidemann, Mrs. Lavon	
Heinrichs, Lyle	WPTF
Howell, Harry	WPTF
Howell, Mrs. Harry	
Huggenberger, Steve	WPTF
Jedlicka, Lumir	WPTF
Johannes, Clint	WPTF
Johns, Alice	
Kopplin, Gail (SENATOR)	
Kopplin, Mrs. Mary	
Kraus, Don	WPTF
Kriz-Wickham, Bobbie	
Kurtz, Tina	
Linder, Mike	
Nellor, Lloyd	WPTF
Nellor, Janice	
Nelson, Dave	WPTF
Nelson, James	WPTF
Oligmueller, Gerry	

Patterson, Roger	WPTF
Patterson, Roy	
Pederson, Don (SENATOR)	
Reisdorff, Greg	
Rempe, Davis	
Rempe, Jay	WPTF
Reynolds, Larry	
Rowe, David	
Salzwedel, Mike	
Sands, Dave	WPTF
Schmidt, Allen	WPTF
Schrock, Ed (SENATOR)	WPTF
Schwarz, Linda	
Schwarz, Tom	WPTF
Smith, Dan	WPTF
Strauch, Dennis	WPTF
Strauch, Mrs. Dennis	
Swanda, Marv	
Thompson, Mike	
Thorburn, John	
Trambly, Nelson	WPTF
Uhrenholdt, Richard	WPTF
Whitmore, Greg	WPTF
Whitmore, Maru	
Williamson, Dayle	
Winz, Ray	
70	

Water Policy Task Force Membership

Natural Resources Districts

Ron Bishop **
Central Platte NRD
215 N. Kaufman Avenue
Grand Island, NE 68803
(308) 385-6282
rbishop@cpnrd.org

John Turnbull *
Upper Big Blue NRD
105 Lincoln Avenue
York, NE 68467
(402) 362-6601
(402) 362-1489 fax
jturnbull@upperbigblue.org

Jim Meisner
Twin Platte NRD
1380 Road East J North
Paxton, NE 69155
(308) 284-6509

Dan Smith
Middle Republican NRD
220 Center Avenue, PO Box 81
Curtis, NE 69025
(308) 367-4281 work
(308) 367-4285 fax
dsmith@mrnrd.org

Dave Nelson
Tri-Basin NRD
1757 B Road
Upland, NE 68981
(402) 756-0724

Power

Clint Johannes
Nebraska Electric G&T
326 Road K
Columbus, NE 68601
(402) 352-5640 home
(402) 564-8142 work
cjohannes@neb.rr.com

Don Kraus **
Central NE Public Power & Irrigation District
415 Lincoln Street PO Box 740
Holdrege, NE 68949
(308) 995-8601
(308) 995-5705 fax
dkraus@cnppid.com

Brian Barels
NE Public Power District
6375 Country Club Drive
Columbus, NE 68601
(402) 563-5335
blbarel@nppd.com

Don Suda
Southwest Public Power District
Box 289
221 No. Main St.
Palisade, NE 69040
(308) 285-3295
dons@swppd.com

Municipalities

Ted Cook
PO Box 701
Lexington, NE 68850
(308) 324-3733
(308) 325-0923 cell
tcook@dawsonppd.com

Curt Friesen
1000 17th Street
Henderson, NE 68371
(402) 723-5339
cfries@mainstaycomm.net

Dan Crouchley
Metropolitan Utilities
1723 Harney Street
Omaha, NE 68102-1960
dan_crouchley@mudnebr.com

Steve Huggenberger *
575 South 10th Street, Room 4201
Lincoln, NE 68508
(402) 441-7285
huggenbe@netinfo.ci.lincoln.ne.us

Gary Mader **
Grand Island Utilities Department
PO Box 1968
Grand Island, NE 68802-1968
(308) 385-5444 #280
gmader@grand-island.com

Agriculture

Galen Frenzen
Nebraska Cattlemen
Route 2 Box 14
Fullerton, NE 68368
(308) 536-2069 home
(308) 550-0237 cell

Jay Rempe **
Nebraska Farm Bureau
PO Box 80299
Lincoln, NE 68501
(402) 421-4447
jayr@nefb.org

Greg Whitmore *
Nebraska Corn Growers
12959 W Road
Shelby, NE 68662
(402) 527-5648 --- also fax
whitgr79@stewireless.com

Recreation

James Coady *
RR 3 Box 197
McCook, NE 69001
(308) 345-6396
(308) 345-5925 work

Gloria Erickson **
315 18th Avenue
Holdrege, NE 68949
(308) 995-6286
gerickson@atcjet.net

Environmental

Lorrie Benson *
Groundwater Foundation
5561 South 48th #215
Lincoln, NE 68516
(402) 423-5137
(402) 434-2740 work
lorrie@groundwater.org

Duane Hovorka
Executive Director
Nebraska Wildlife Federation
Elmwood, NE 68349
(402) 994-2001
NebraskaWildlife@alltel.net

Dave Sands **
7700 SW 27th Street
Lincoln, NE 68523
(402) 423-9246
cellosands@msn.com

At-Large

Jack Maddux *
264 E Wichita, Box 217
Wauneta, NE 69045
(308) 394-5348

Dennis Strauch **
50189 Hilyard Drive
Mitchell, NE 69357
(308) 623-1782
(308) 623-1022 work
pid@prairieweb.com

Patrick Heath
600 18th Street
Gering, NE 69341
(308) 436-6834
pheath@gering.org

Nelson Trambly
RR 1 Box 71
Campbell, NE 68932
(402) 756-8505
(402) 746-3810 cell

Irrigators

(Republican)-Groundwater
Robert Ambrosek **
HC 67 Box 33A
Haigler, NE 69030
(308) 423-2629
rambrosek@bwtelcom.net

(Republican)-Surface
Claude Cappel
HC 30 Box 91A
McCook, NE 69001
(308) 345-5569, 345-5518 fax
ccappel@ocsmccook.com

(Republican)-Surface
Jim Miller *
Route 1 Box 109
Hardy, NE 68943
(402) 279-2925
jdmiller@cornhusker.net

(North Platte)-55% Surface/45% Ground
Harry Howell *
372 S-H Road
Morrill, NE 69358
(308) 247-2954
(308) 247-2848 office

(North Platte)-Primarily Surface

LeRoy Pieper
140018 Pieper Lane
Mitchell, NE 69357
(308) 623-2535
lpieper@actcom.net

(Middle Platte)-Groundwater

Tom Schwarz **
311 Medina Avenue
Bertrand, NE 68927
(308) 472-5309
tschwarz@atcjet.net

(Loup)-Both Ground/Surface

Allen Schmidt
PO Box 51
Arcadia, NE 68815
(308) 789-6401

(Elkhorn)-Groundwater

Richard Uhrenholdt
PO Box 431
Elgin, NE 68636
(402) 843-2471
baf@starband.net

(Big Blue)-Groundwater

Gene Glock
3031 G Road
Rising City, NE 68658
(402) 542-2194
eugeneglock@yahoo.com

(South Platte)-Both Ground/Surface

Ken Schilz
PO Box 3
Ogallala, NE 69153
(308) 287-2341
keschilz@charter.net

(Nemaha)-Groundwater

J. Duane Sugden
RR 1 Box 55
Sterling, NE 68443
(402) 866-6689

(Middle Platte)-Groundwater

Dick Mercer
3385 East 11th Street
Kearney, NE 68847
(308) 234-9549
(308) 237-2284 fax

(Loup)-Surface

James Nelson
332 Salem Road
Boelus, NE 68820
(308) 996-4349
jimar@nctc.net

(Big Blue)

Nancy Eberle *
520 Road 20
Bradshaw, NE 68319
(402) 736-4691
(402) 736-4456 fax
eg55038@alltel.net

(Little Blue)-Groundwater

Lyle Heinrichs
RR 2 Box 63
Shickley, NE 68436
(402) 627-3825
lh43936@alltel.net

(Lower Platte)-Mostly Groundwater

Lumir Jedlicka **
713 Road 15
Schuyler, NE 68661
(402) 352-5884
(402) 615-0483 cell

(Niobrara)-Groundwater

John Burke
7308 Thomas Road
Alliance, NE 69301
(308) 762-5151
(308) 760-5151 cell
jtburke@premaonline.com

(White/Hat)-Surface

Gary E. Thayer
522 West Hat Creek Road
Harrison, NE 69346
(308) 668-2358

(Missouri Tributaries)-Groundwater
Bryce Andersen
765 200th Street
Dakota City, NE 68731
(402) 987-3250
andersen7470@aol.com

(Elkhorn)
Lloyd G. Nellor
1686 11th Road
Beemer, NE 68716
(402) 528-3319

Department of Natural Resources

Roger Patterson **
PO Box 94676
Lincoln, NE 68509-4676
(402) 471-2363
rpatterson@dnr.state.ne.us

Attorney General's Office

Dave Cookson **
PO Box 98920
Lincoln, NE 68509-8920
(402) 471-4219
dcookson@notes.state.ne.us

Natural Resources Committee

Senator Ed Schrock **
74274 K Road
Elm Creek, NE 68836
(308) 995-4665
eschrock@unicam.state.ne.us

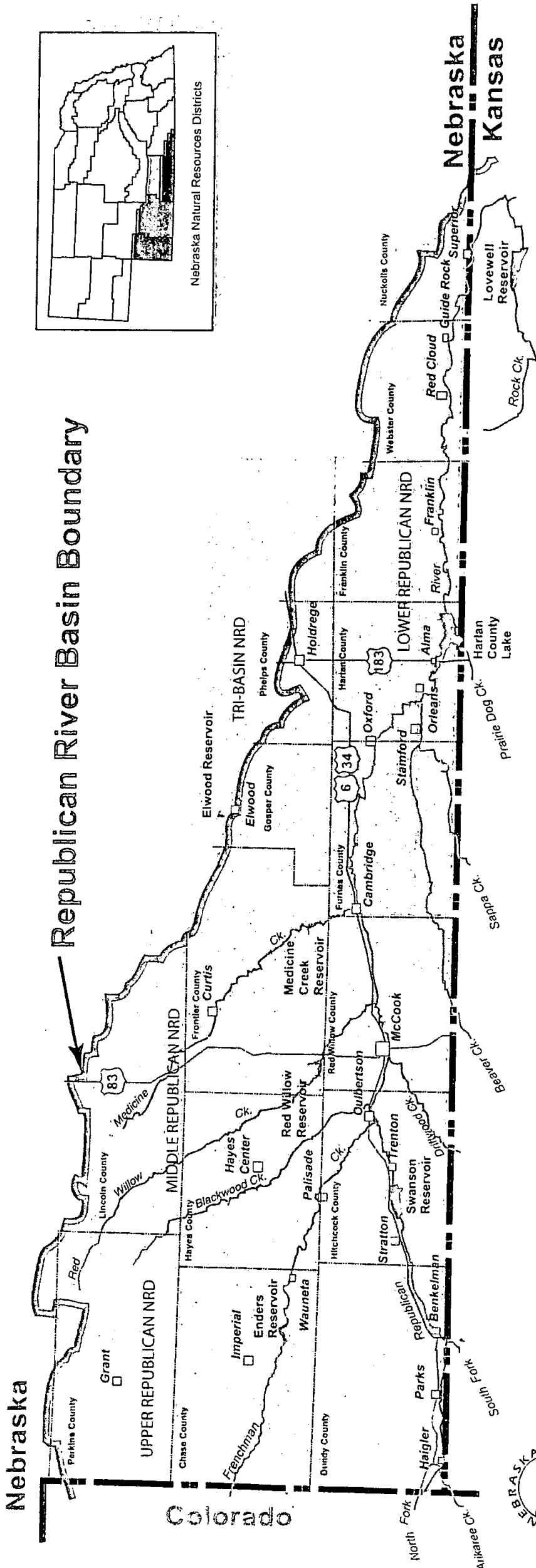
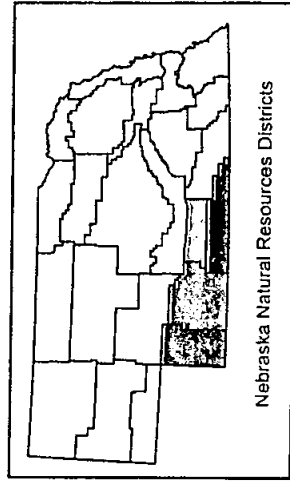
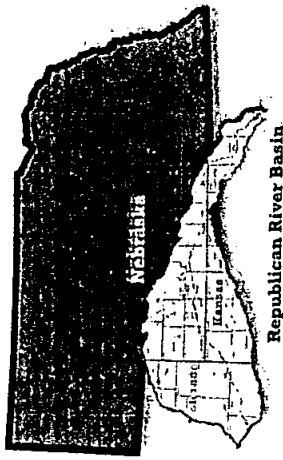
Senator Elaine Stuhr **
208 Road 18
Bradshaw, NE 68319
(402) 736-4427
estuhr@unicam.state.ne.us

Facilitator

Jonathan Bartsch
CDR Associates
100 Arapahoe Avenue, Suite 12
Boulder, CO 80302
(303) 442-7367
jbartsch@mediate.org

**** Executive Committee Member**
*** Executive Committee Alternate**
Updated July 2005

Republican River Basin in Nebraska



Nebraska Department of Natural Resources
July 2005
Nebraska Water Policy Task Force Tour

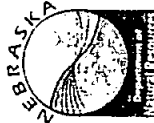
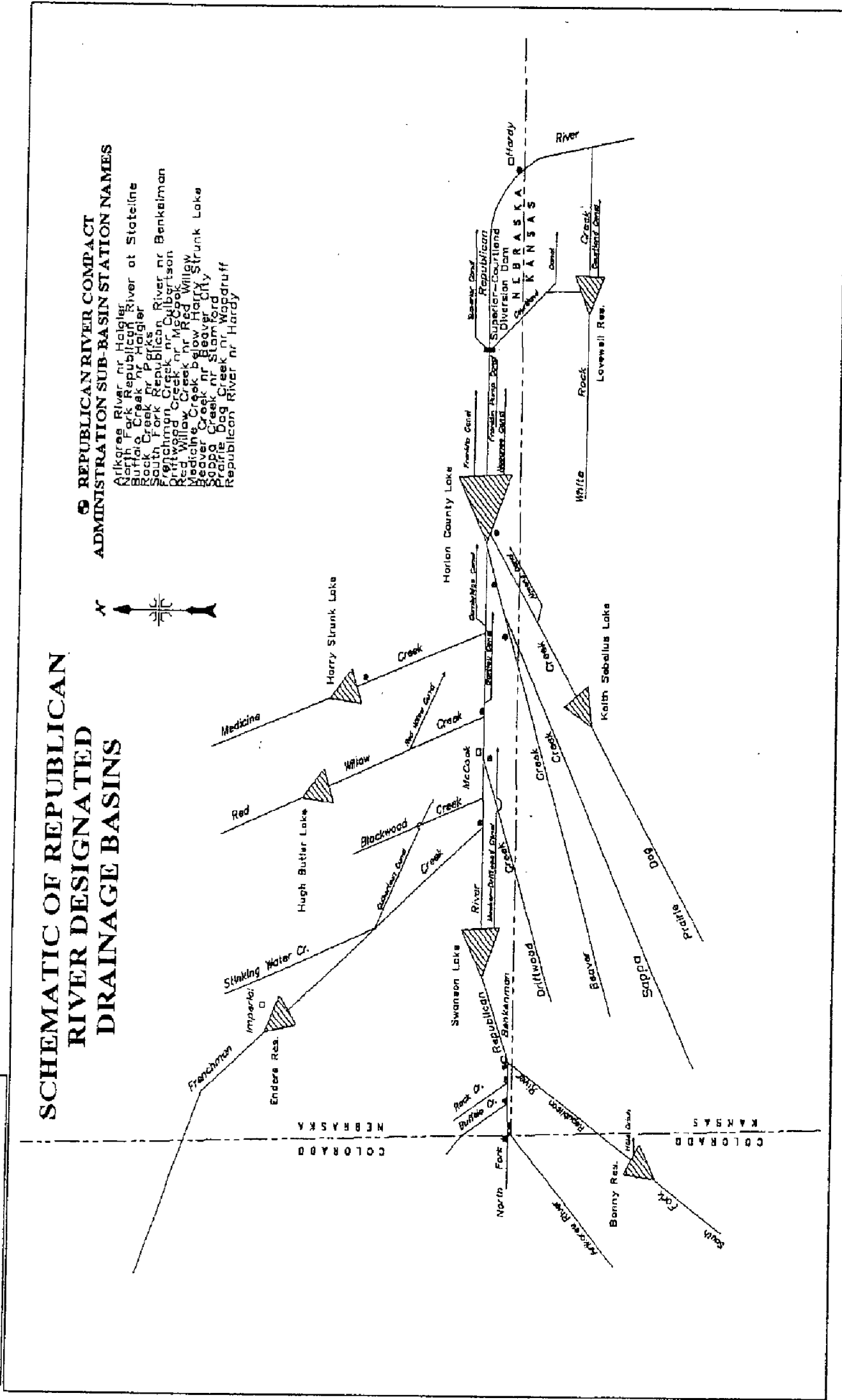
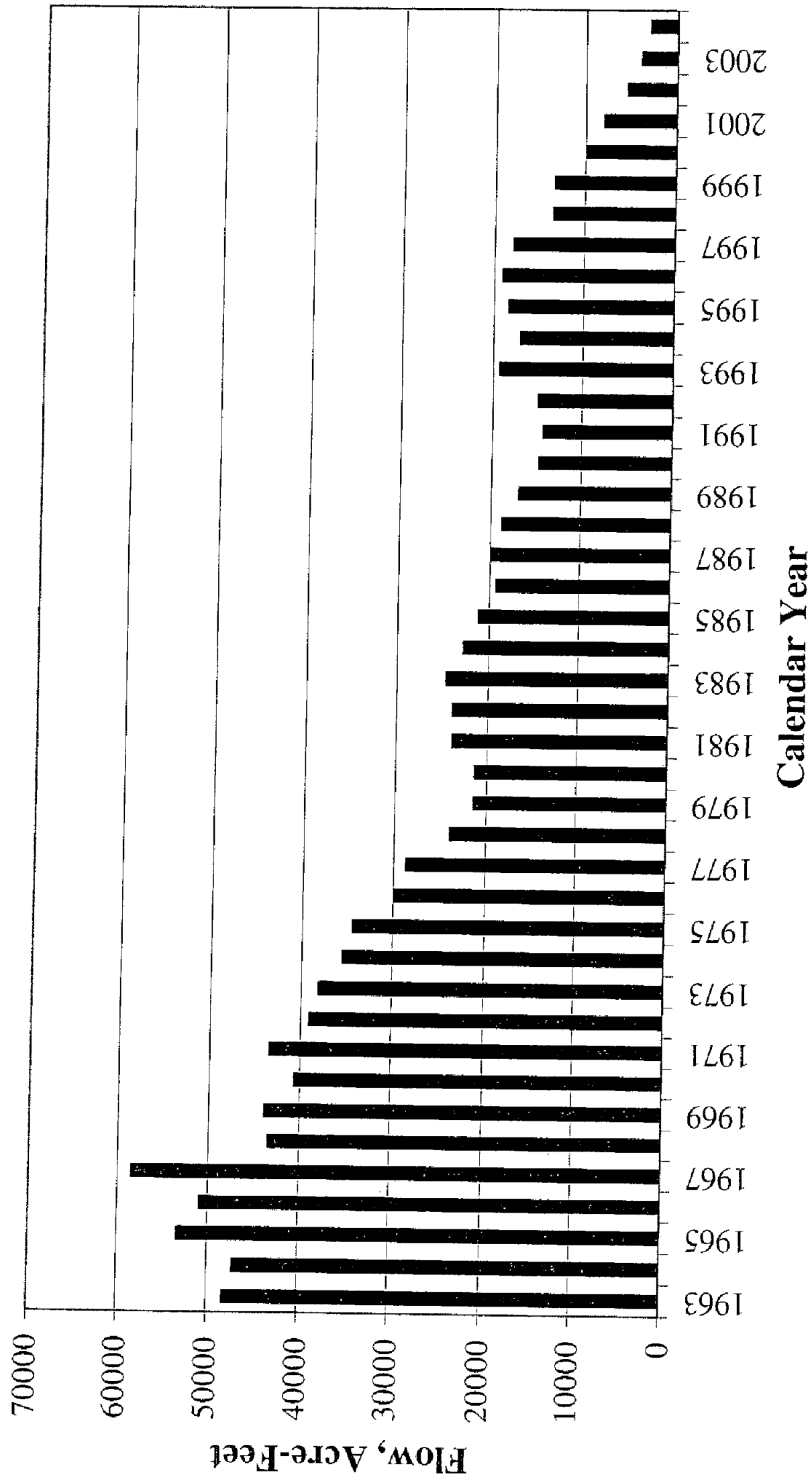


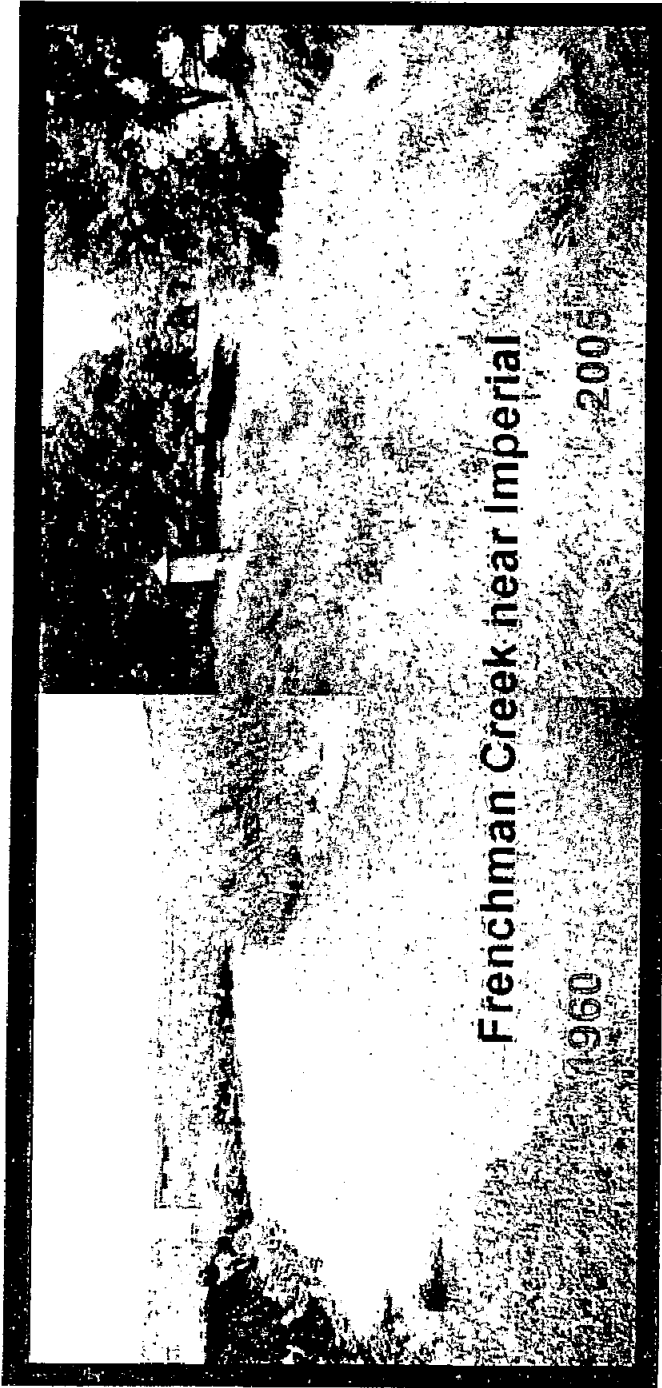
Figure 2



Line Diagram of Designated Drainage Basins Showing Federal Reservoirs and Sub-basin Gaging Stations

Annual Flow of Frenchman Creek near Imperial, Inflow to Enders Reservoir



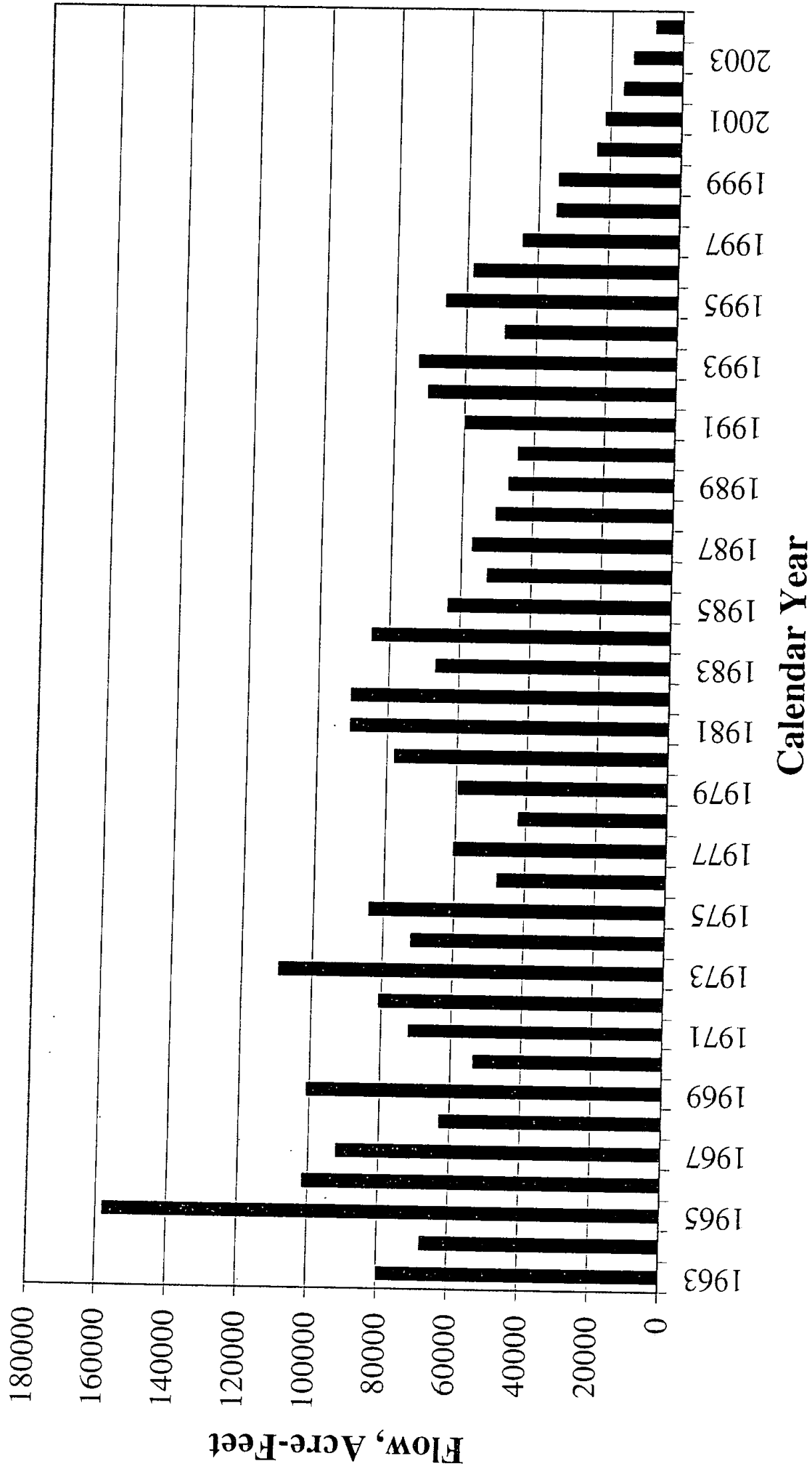


Frenchman Creek near Imperial

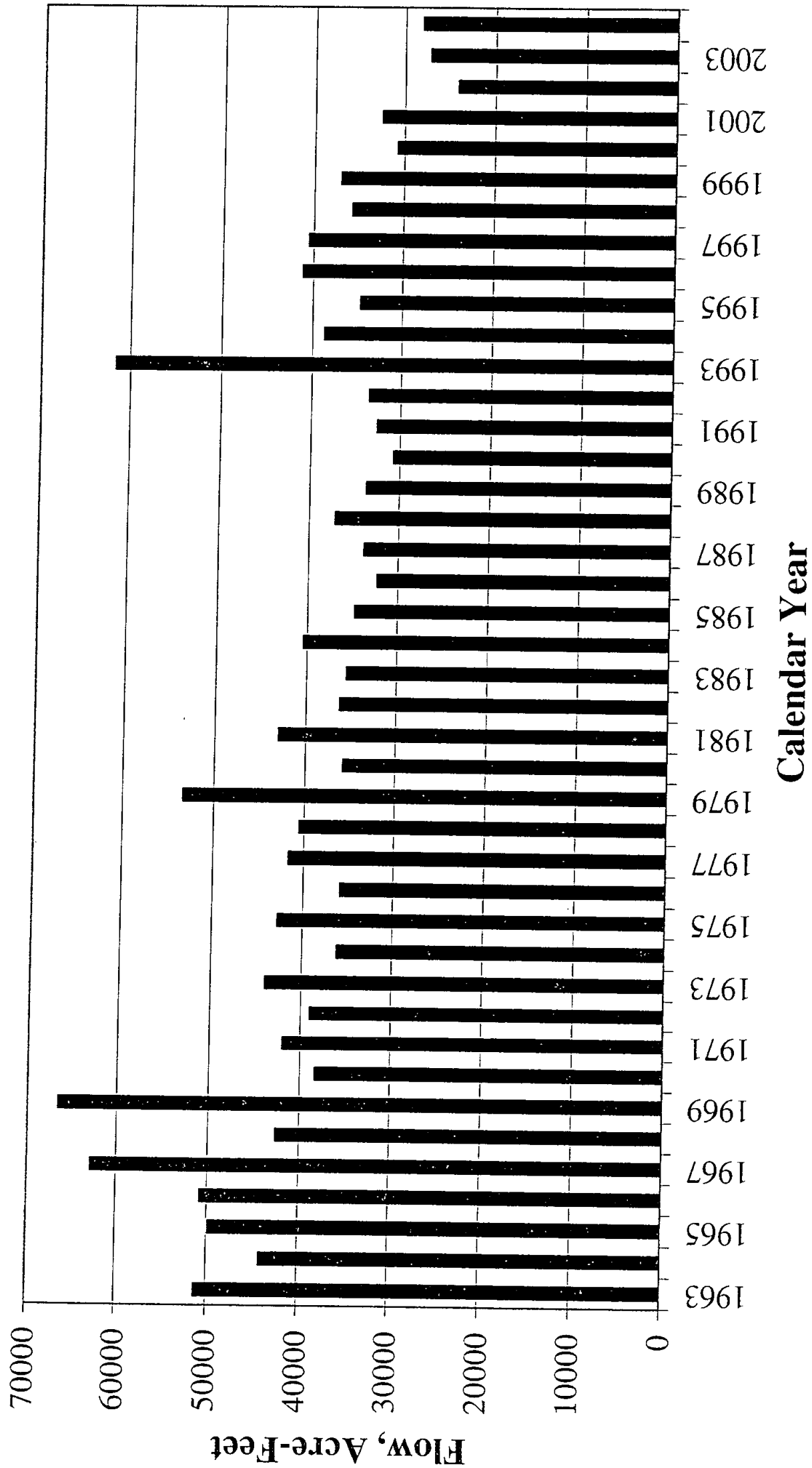
1960

2005

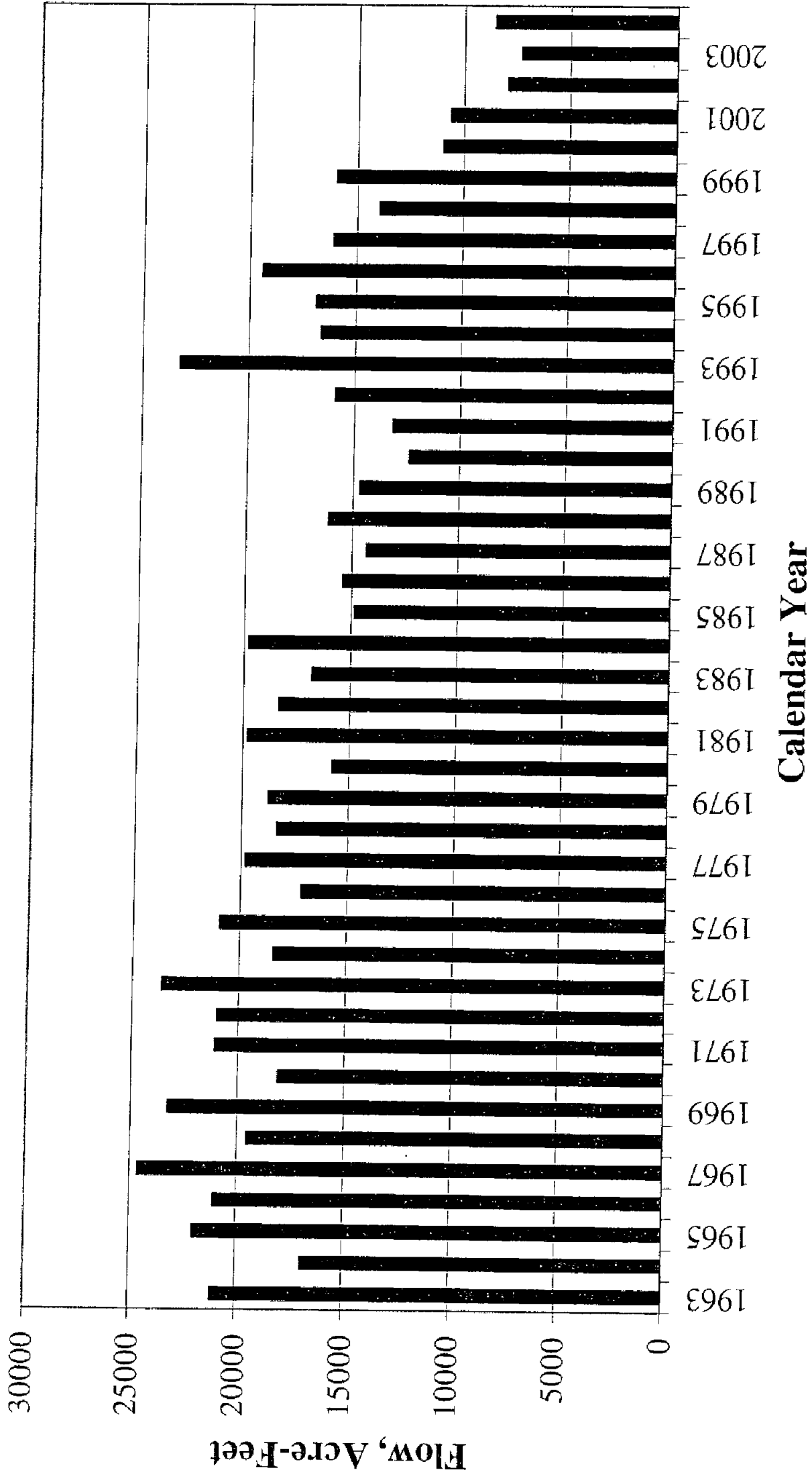
Annual Flow of Republican River at Stratton, Inflow to Swanson Reservoir



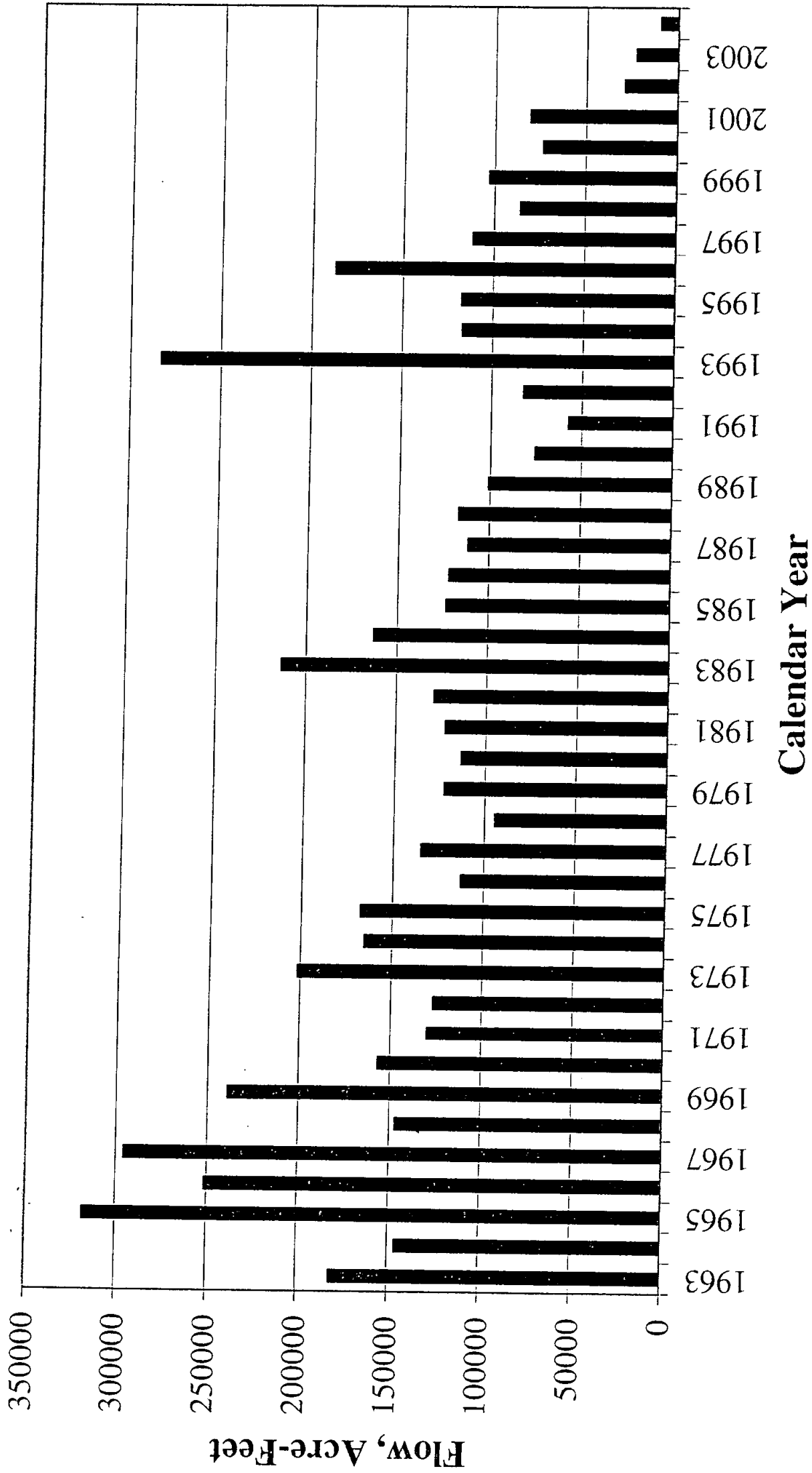
Annual Flow of Medicine Creek above Harry Strunk Reservoir, Inflow to Harry Strunk Reservoir



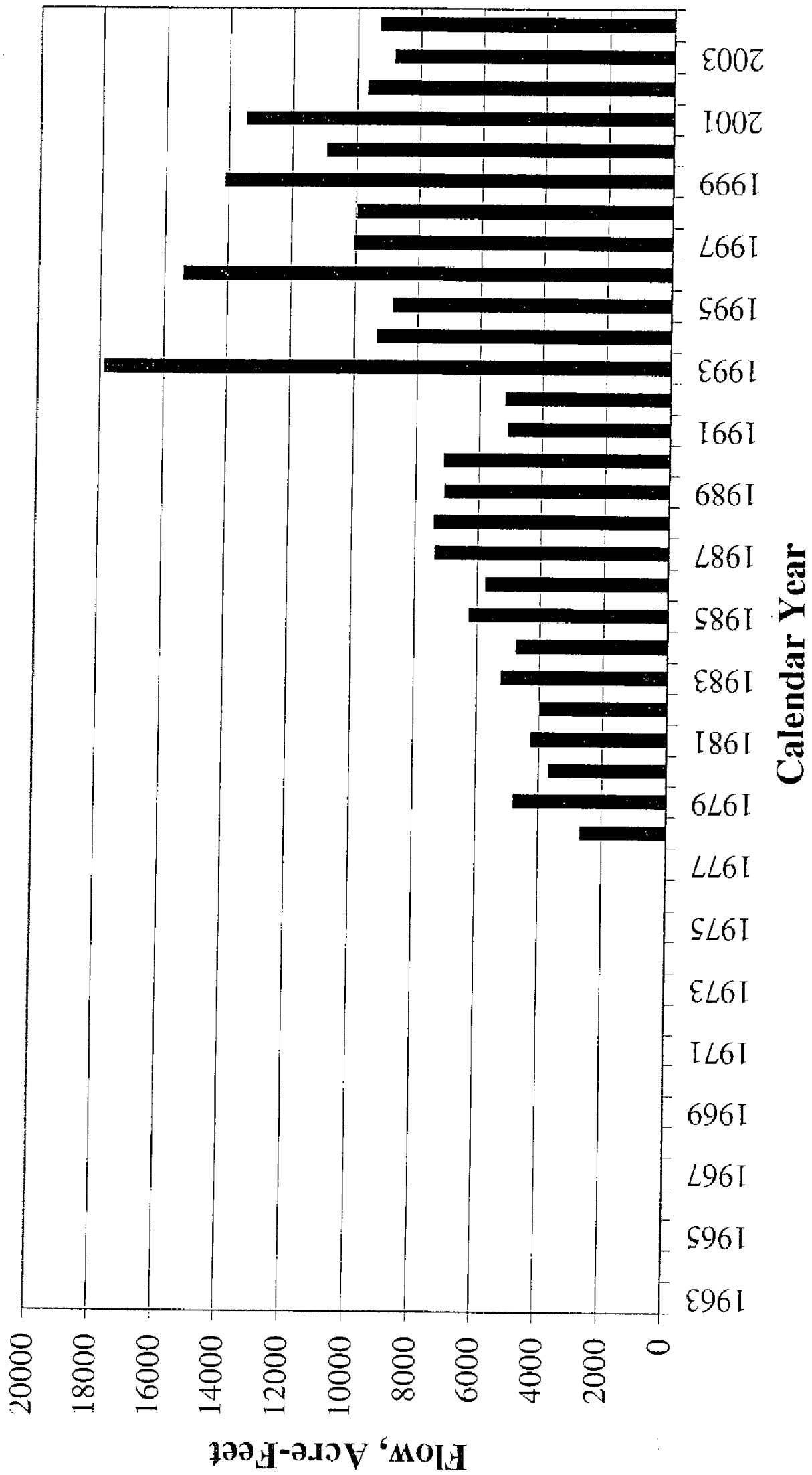
Annual Flow of Red Willow Creek above Hugh Butler Reservoir, Inflow to Hugh Butler Reservoir



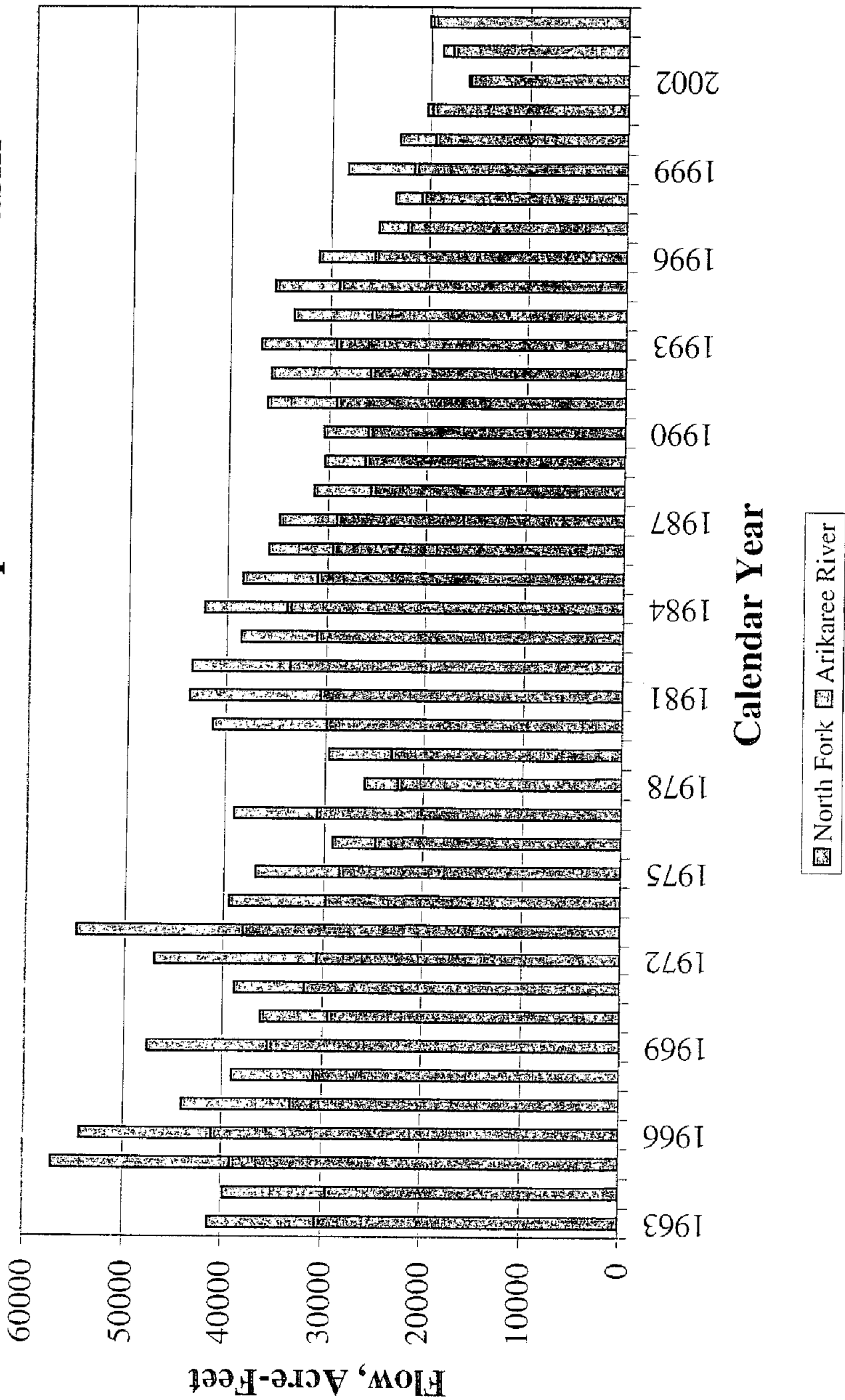
Annual Flow of Republican River at Orleans, Inflow to Harlan County Lake



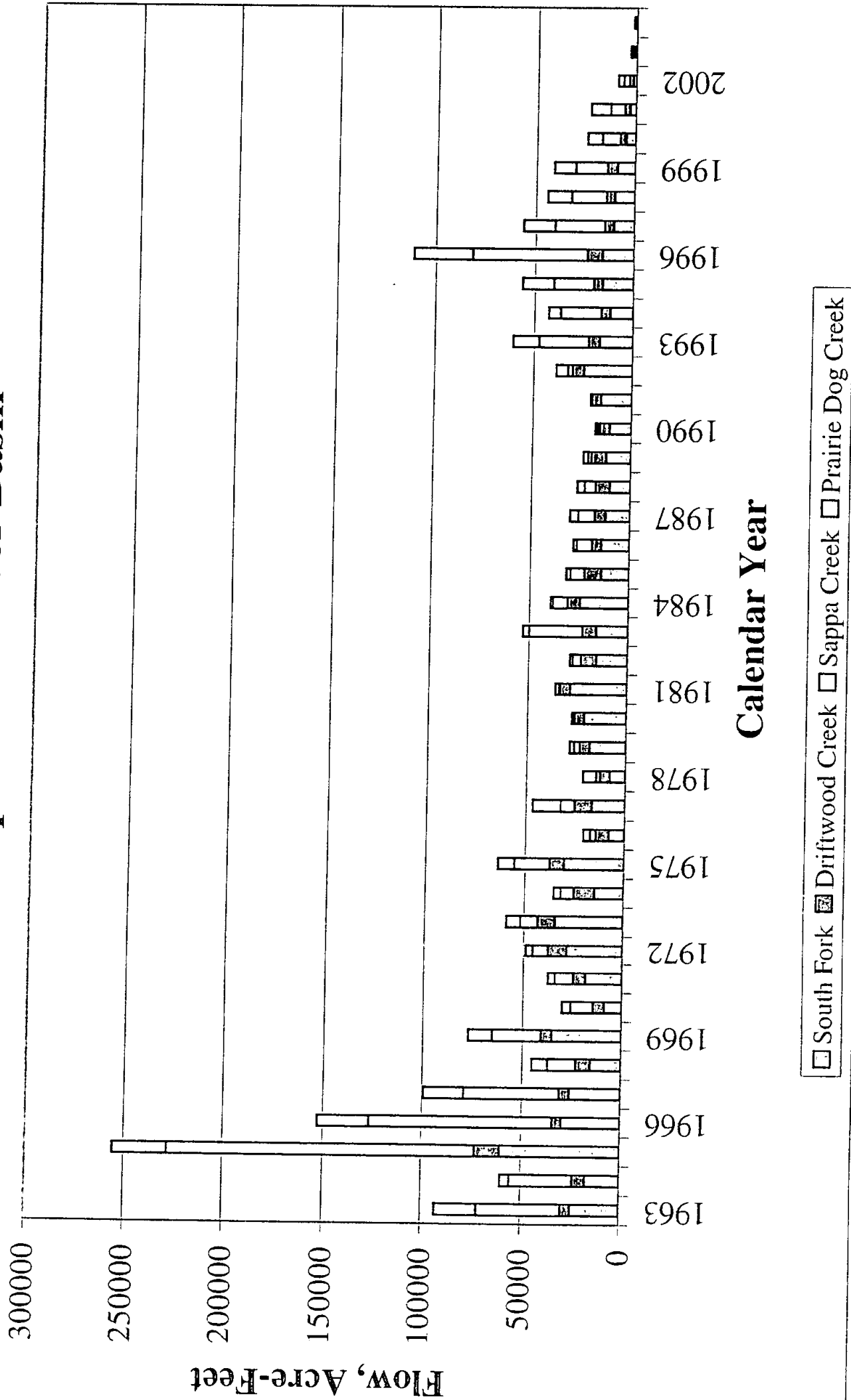
Annual Flow of Turkey Creek at Edison, Includes Outflow from the Mound



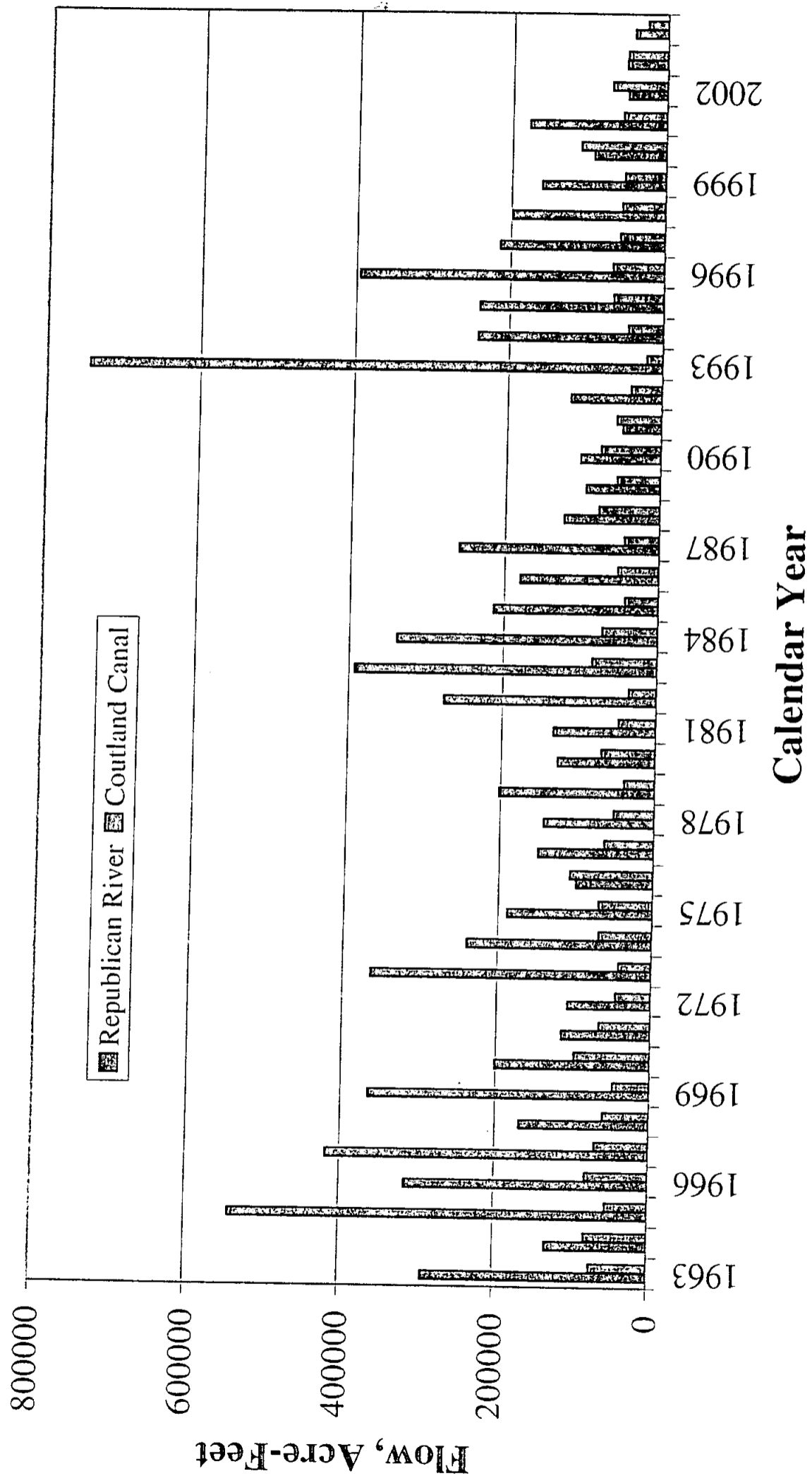
Annual Inflows of North Fork and Arikaree River from Colorado into Nebraska Republican River Basin



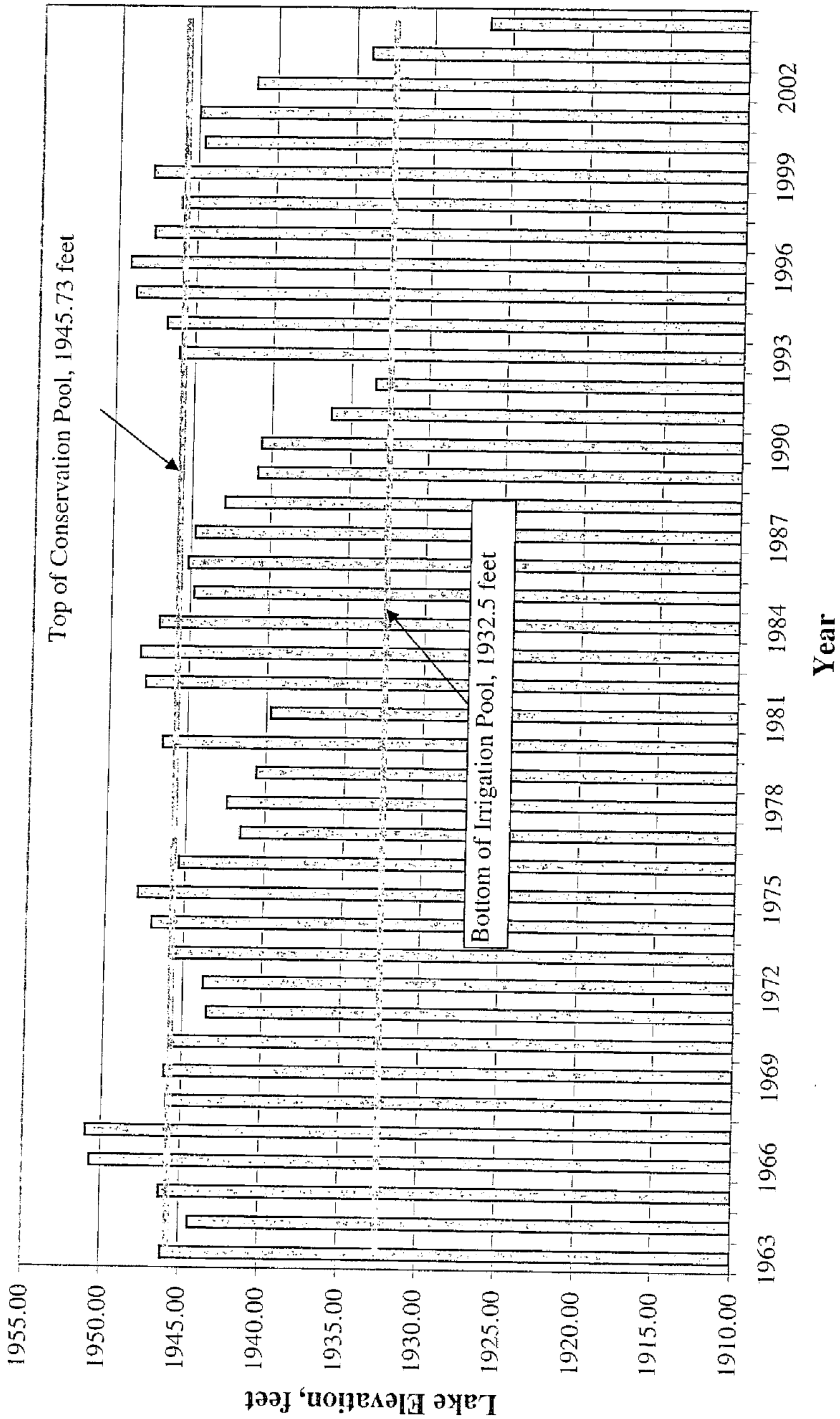
Annual Inflow from Kansas into Nebraska Republican River Basin



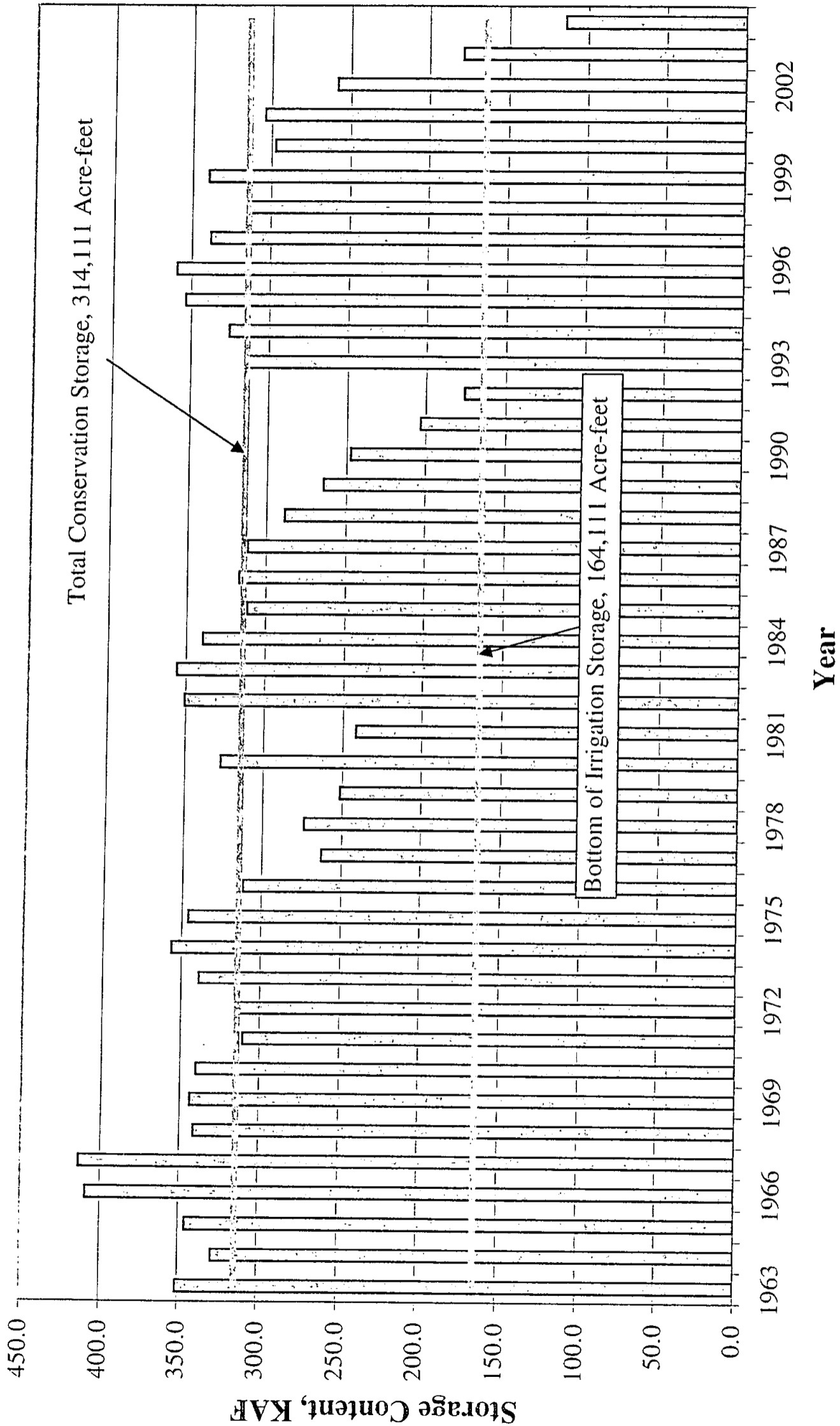
Annual Flows of Republican River at Hardy and Courtland Canal at Nebraska-Kansas State Line



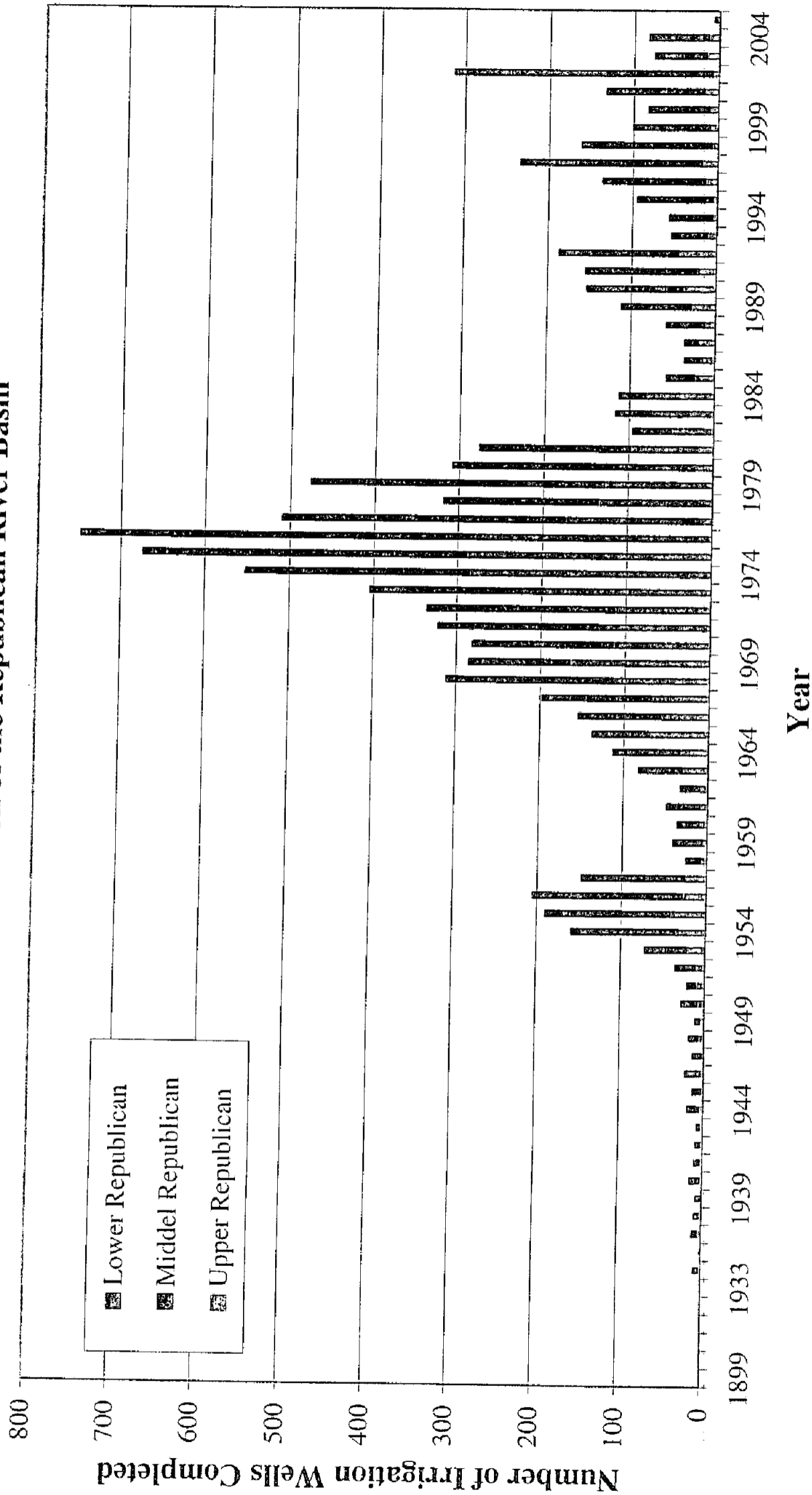
Harlan County Lake End-of-June Elevation



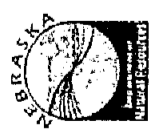
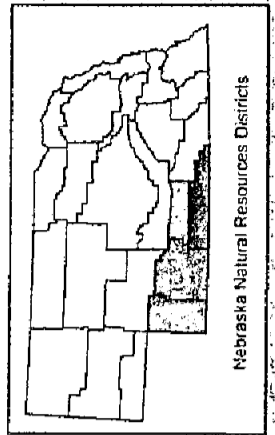
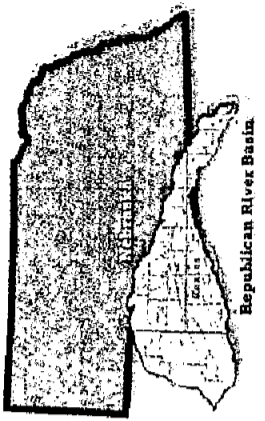
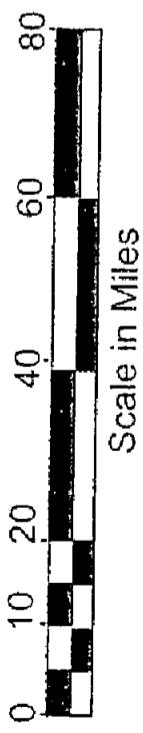
Harlan County Lake End-of-June Content



Registered Irrigation Wells by Completion Date In the Nebraska Portion of the Republican River Basin



Irrigation Wells in Nebraska Portion of Republican River Basin

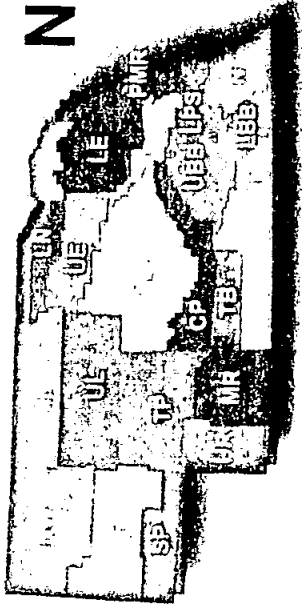


Nebraska Department of Natural Resources
July 2005
Nebraska Water Policy Task Force Tour

tlc 05.ai

New Irrigation Wells per Year 1993-2004 by NRD

(by well completion year)



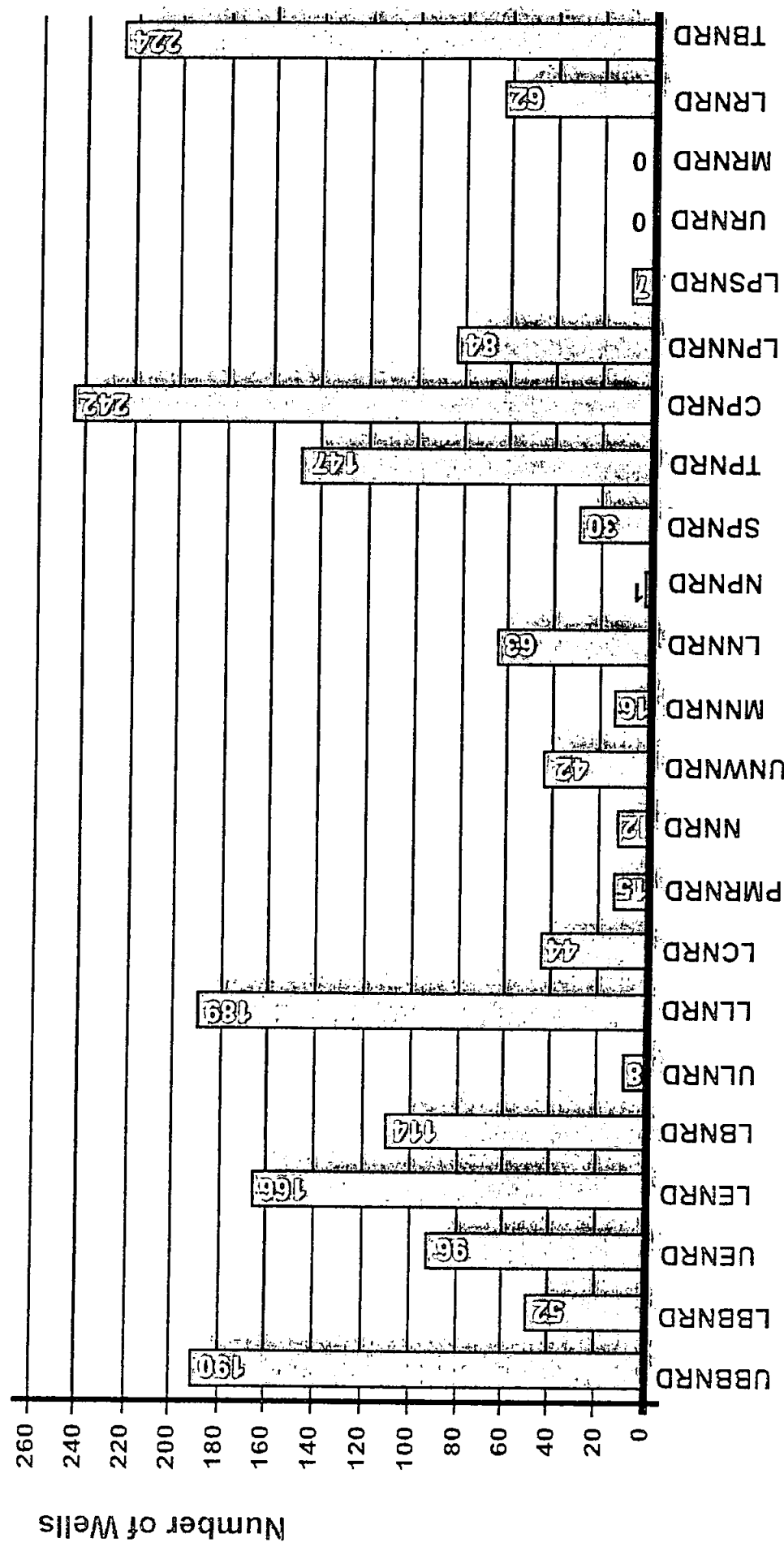
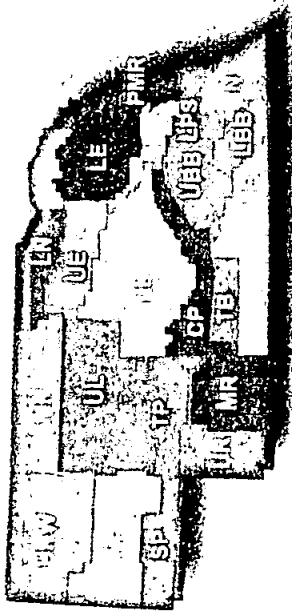
Natural Resources District	New Irrigation Wells per Year 1993-2004											
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Central Platte	51	73	97	126	107	85	52	79	112	192	291	242
Lewis & Clark	3	5	7	16	19	21	14	19	16	11	20	44
Little Blue	43	37	48	85	73	71	46	58	67	56	108	114
Lower Big Blue	10	9	21	22	22	16	11	29	26	12	45	52
Lower Elkhorn	26	37	52	95	93	80	44	63	38	64	141	166
Lower Loup	30	36	69	115	95	95	40	92	95	117	229	189
Lower Niobrara	11	11	14	15	36	36	3	17	12	22	54	63
Lower Platte North	22	25	42	100	41	43	20	34	22	54	94	84
Lower Platte South	0	6	3	7	13	4	7	3	11	4	8	7
Lower Republican	23	33	73	70	137	75	47	46	53	242	14	62
Middle Niobrara	3	4	1	3	2	2	0	6	6	4	21	16
Middle Republican	17	15	19	48	81	69	32	25	53	71	1*	0
Nemaha	2	5	2	2	3	2	0	7	13	15	9	12
North Platte	37	50	30	40	47	37	32	47	28	112	108	1
Papio-Missouri River	1	9	16	13	17	14	26	17	12	11	12	15
South Platte	8	17	10	16	14	11	9	14	17	33	25	30
Tri-Basin	32	34	46	55	47	54	17	21	30	49	95	224
Twin Platte	21	23	29	54	43	27	26	48	56	77	123	147
Upper Big Blue	55	60	88	162	90	55	54	60	72	93	179	190
Upper Elkhorn	23	26	19	40	61	64	18	38	29	43	76	96
Upper Loup	5	2	0	3	3	2	1	2	6	4	17	8
Upper Niobrara-White	17	22	19	14	14	22	8	15	14	32	77	42
Upper Republican	9	3	4	12	15	1	3	3	0	0	0	0
Total	449	542	709	1113	1073	866	510	743	788	1317	1747	1804

Total Wells per/year

* football field

llc 05.ai

New Irrigation Wells in 2004 by NRD



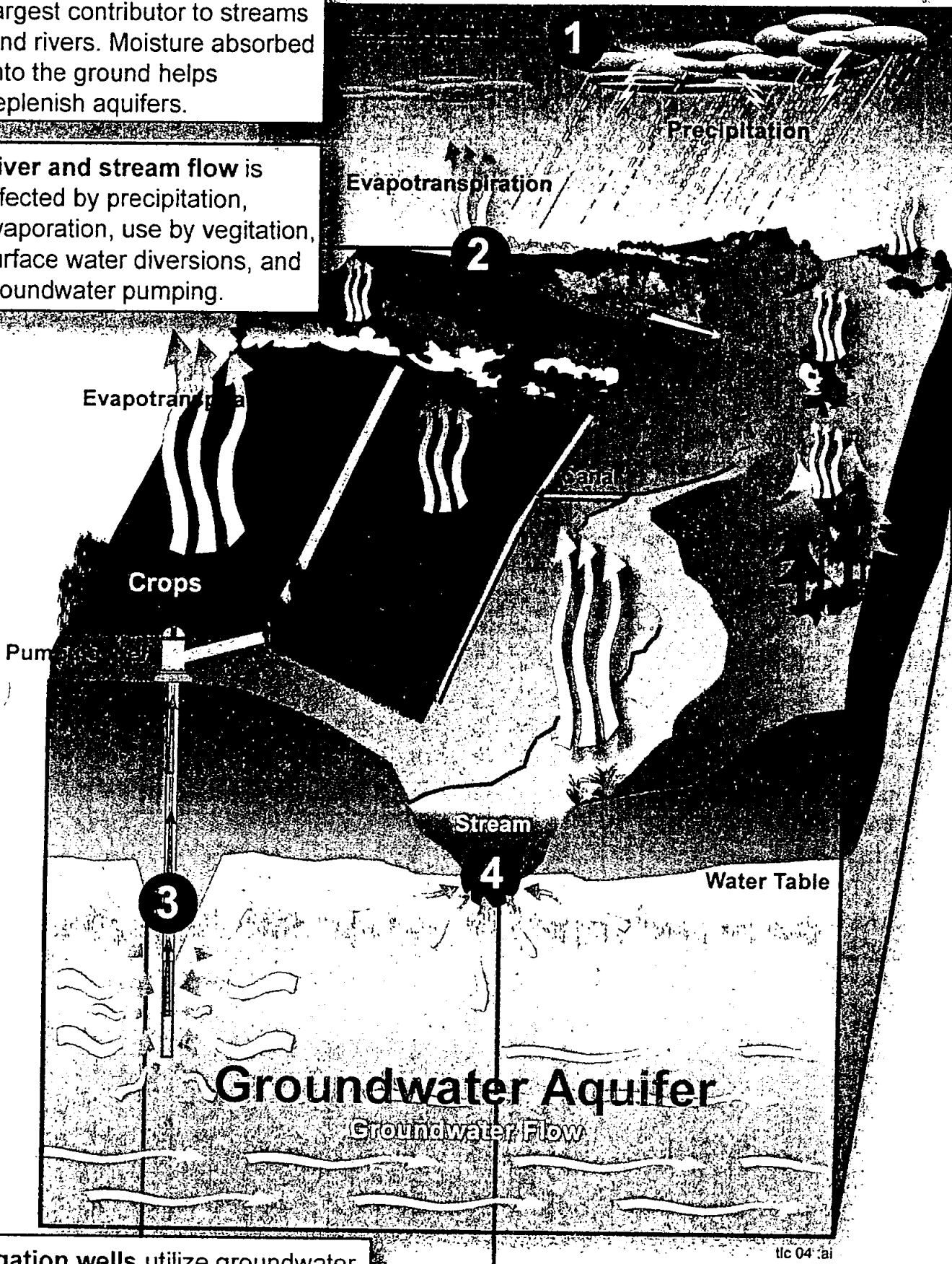
Natural Resources Districts

June 2005
t/c.ai

Groundwater Pumping and Stream Flow

Precipitation is generally the largest contributor to streams and rivers. Moisture absorbed into the ground helps replenish aquifers.

River and stream flow is affected by precipitation, evaporation, use by vegetation, surface water diversions, and groundwater pumping.



Nebraska has reached a crossroads in the use of water, our most important natural resource. In the last two decades, demands on water use have reached the limits of the supply in some of Nebraska's river basins.

Irrigation wells utilize groundwater aquifers and will lower water tables when more water is pumped than is being replenished.

Rivers and streams exchange water with groundwater aquifers. When water tables are high groundwater can flow into rivers, when they are low surface water may replenish aquifers.

Published by the
Nebraska Department of Natural Resources
October 2004



By Roger K. Patterson, P.E., Director,
Nebraska Department of Natural Resources
and
Ann Bleed, Ph.D, P.E., Deputy Director

Nebraska has reached a crossroads in the use of water, our most important natural resource. In the last two decades, demands on water use have reached the limits of the supply in some of Nebraska's river basins. Disputes have arisen internally and with our neighboring states. Surface-water appropriators on the Republican River and Platte River systems have raised concerns that groundwater pumping has depleted their surface-water supplies.

In 1998, Kansas sued Nebraska, complaining that Nebraska's groundwater pumping was causing Nebraska to be out of compliance with the 1943 Republican River Compact. In 2000, the U.S. Supreme Court ruled that the compact regulates portions of groundwater use. In 2001, litigation over the impact of groundwater pumping on surface-water supplies was initiated in regard to Pumpkin Creek, a Panhandle tributary of the North Platte River. The common thread in each of these situations is the hydrologic connection between surface water and groundwater and how to manage this combined resource.

In response to these growing concerns, the Legislature formed a 49-member Water Policy Task Force. In 2004, the Legislature adopted the task force's recommendations and **passed Legislative Bill 962**. LB 962 addressed the issue of managing **hydrologically connected water supply and demand** by amending the Groundwater Management and Protection Act to provide for proactive, integrated management of hydrologically connected surface and groundwater supplies. Under Nebraska law, the local natural resources districts have been responsible for managing groundwater use. The Nebraska Department of Natural Resources has been responsible for administering surface-water supplies and ensuring the state's compliance with interstate compacts. LB 962 did not change this basic institutional structure. LB 962 does require that the Department of Natural Resources and the NRDs work together **to jointly develop and implement integrated management plans to manage hydrologically connected surface-water and groundwater supplies.**

The key to developing a successful integrated management plan is an understanding of how the state's groundwater supplies interact with the state's surface-water supplies. Unlike surface-water flow, which is relatively easy to understand because it is readily observed and easily measured, groundwater flow is hidden and difficult to measure. Groundwater moves much slower than surface water, often only a few feet

per year. This slow movement of water occurs through the pore spaces between the sands, gravels and other subsurface materials below the ground. These materials that store and transmit water are called aquifers.

To visualize an aquifer, think of a sandbox filled with sand. Now, pour water into the box. The water fills the empty spaces between the grains of sand. That is what happens with groundwater in an aquifer. If there is a drain hole on the side of the sandbox, water will flow toward the hole until the sand is drained. The drain is like a river. If you dig a hole in the sand in the middle of the box, you may see water in the hole. If you scoop water out of the hole with a cup, water will move into the hole from the surrounding sand. That hole is like a pumping well. Scooping water out of the hole in the sand reduces the amount available to go out the drain hole.

Water in Nebraska's streams comes from two sources: (1) runoff from local precipitation and, in some cases, Rocky Mountain snowmelt; and (2) discharge from groundwater aquifers. While there are multiple aquifers in Nebraska, the High Plains Aquifer complex is the primary source of groundwater. This groundwater reservoir is mostly comprised of the Ogallala formation and overlying sands and gravels. The Ogallala formation itself contains a complex mixture of sands, gravels, sandstones, silts and clays, much of which is well-suited for holding and moving groundwater. This formation was deposited over millions of years. In the natural state, water is removed from the groundwater system by evaporation, by consumption by plants and animals or by flowing out of the system to a stream. People also remove water from the integrated system, either by diverting it directly from a stream or by pumping it from wells (see graphic).

Much of what we know about groundwater movement comes from extensive geologic and climatological investigations over the last 100 years. In addition, we use groundwater models to further our understanding of the system and to make estimates of how much water might be available in the future under different management scenarios. These groundwater models use available information such as groundwater levels, precipitation, pumping and stream flow to calculate water levels and flows everywhere in the aquifer. The model is constructed so that it matches all the real-world observations of the groundwater system.

How does water use affect the overall supply?

Though different in many respects, there are a number of basic principles common to both surface-water and groundwater systems.

- **First**, where groundwater aquifers are in hydrologic connection with surface-water streams, the two must be viewed as a single, integrated system. The addition of water to either the aquifer or the stream will result in an increase to the other over time. Likewise, the removal of water from

either the aquifer or the stream will result in a decrease to the other over time. The integrated system constantly seeks a state of balance.

Second, as a general rule, the amount of water entering any system over the long term must equal the amount leaving the system, including any change in the amount stored in the system. In the shorter term, if inflows exceed outflows, the excess is stored and the water levels in the aquifer rise. Conversely, if the outflow is greater than the inflow to the system, water levels in the aquifer decrease. **Most importantly**, there is not an unlimited supply of water in this system.

We all know that large portions of the state do not receive a lot of rain. In these areas, pumping may cause outflows from the integrated system to exceed the inflows to the point where streams dry up and wells go dry. In other words, if pumping causes the outflow from the system to exceed the inflows, then other outflows such as stream flow, evapotranspiration (the use of water by plants, especially trees and shrubs in river alleys) and groundwater flow to other parts of the aquifer will be reduced until a new equilibrium is achieved.

In an integrated surface-water/groundwater system, depletions to stream flow can occur either by wells intercepting water that otherwise would have flowed to the stream or by causing water to move from the stream to the well.

Figure 2A diagrams a stream-aquifer relationship that is fairly typical of many of Nebraska's streams. If a well starts removing water from the aquifer (**Figure 2B**), the well will intercept water that otherwise would have resulted in providing water to the stream.

As the well continues to pump, more water is removed from the system and less water reaches the stream. Eventually, the pumping continues (**Figure 2C**), water actually flows from the stream toward the well. Generally speaking, both surface-water diversions and

groundwater pumping remove water from the system. But the short term impact of each on the stream can be dramatically different.

A surface-water diversion immediately depletes the stream by the total amount diverted. When the diversion is stopped, the depletion to the stream stops immediately.

When a well starts to pump, there is also an immediate depletion to the stream caused by the instantaneous dropping of water levels everywhere in the aquifer. But although the drop in the water table is substantial close to the well, the drop decreases away from the well until it is so tiny it cannot be observed.

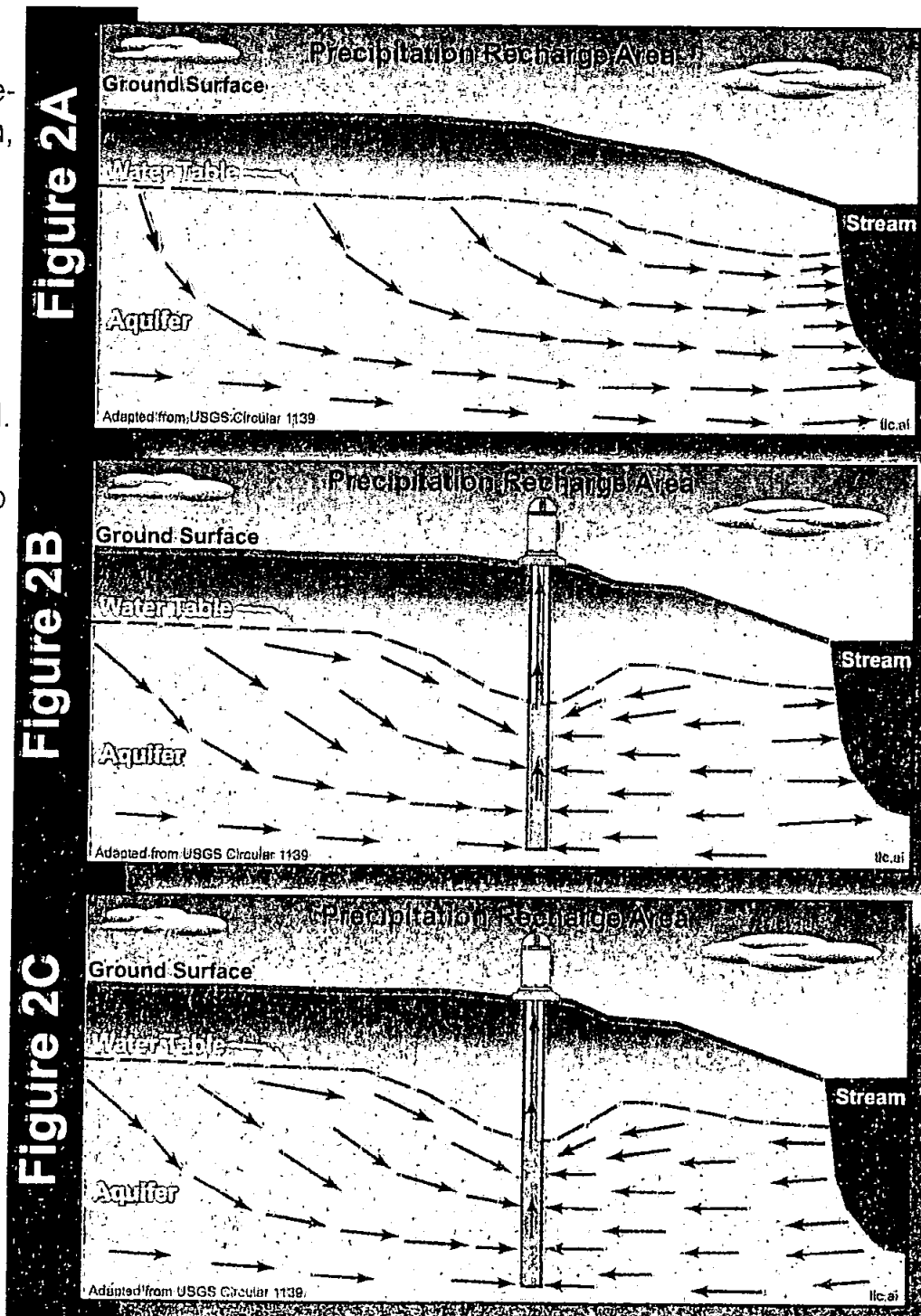
Also in contrast to a surface-water diversion, after the well is turned off, depletions to the stream will continue to increase, often for many years, before they start to decrease.

For example, in a system like the Republican River Basin, a single well far from the river may not draw any significant amount of water from a river for 25 years and may take only 20 percent of its water from the river after 100 years. The well, however, will keep on taking water from the river hundreds of years after pumping stops.

This lag between the time water is pumped from the groundwater and the time the depletion is observed in streams is referred to as the "lag effect."

Some people assume that the lag effect is the result of the velocities at which water moves through the groundwater system; that is, if the groundwater velocity is 100 feet per year, it will take 50 years to see the impact on a stream of a well 5,000 feet from the stream.

This is not the case. An individual water molecule does not have to move from the stream to the well to cause an impact on the stream. Changes in water table elevation and aquifer pressure, not the velocity of water, determine when and how much a well will affect the stream.



To understand this concept, picture a person squeezing a toothpaste tube. If you squeeze at the bottom of the tube, toothpaste comes out the other end, even though the toothpaste hasn't moved through the entire length of the tube. Groundwater responds to changes in water table elevations and pressures in a similar fashion.

Because of the lag effect, a pumping well's impact on a stream will not be noticeable for some time after the well has started pumping, and it will be even longer before the entire impact of the well arrives at the stream.

For example, the chart below depicts the modeled impacts of well pumping on a stream. The first part of the curve shows the increased amount of stream depletion caused as well development increases. After the year 2000, the number of pumping wells was held constant. Nevertheless, the stream depletion continues to increase until a new equilibrium is reached.

In reality, it is not easy to observe the impact of wells on stream flow. Often, variations in precipitation, pumping patterns and stream flow are such that only after many years can the impacts of pumping on stream flow be observed.

A long wet period lowers the demand for water, can partially refill available aquifer storage and mask the impacts of pumping. In contrast, dry periods, like the current drought, highlight the impacts of pumping.

In some cases, the impacts of pumping on groundwater tables are noticeable. But in others, changes in water-table elevation cannot be seen until stream flows have significantly declined.

Finally, not all the water diverted from a stream or pumped by a well is consumed and removed from the integrated surface-water/groundwater system.

Only the water that is actually consumed through evaporation or evapotranspiration is removed. The remaining portion of what was pumped returns to the system as surface-water runoff to a stream or as recharge to an aquifer. For this reason, what really matters is how much water is consumed.

For example, if the consumptive use of an acre of corn is 24 inches in a given year, 10 inches is supplied by local precipitation and the remaining 14 inches is supplied by pumping irrigation water. It doesn't matter significantly if 18 inches or 25 inches of water is pumped on to the field. In either case, only 14 inches will be

consumed. The remaining 4 to 11 inches will return to the system as surface-water runoff or recharge to the aquifer.

To conserve water, it is the amount of water consumed, not just the amount of water pumped, that must be reduced.

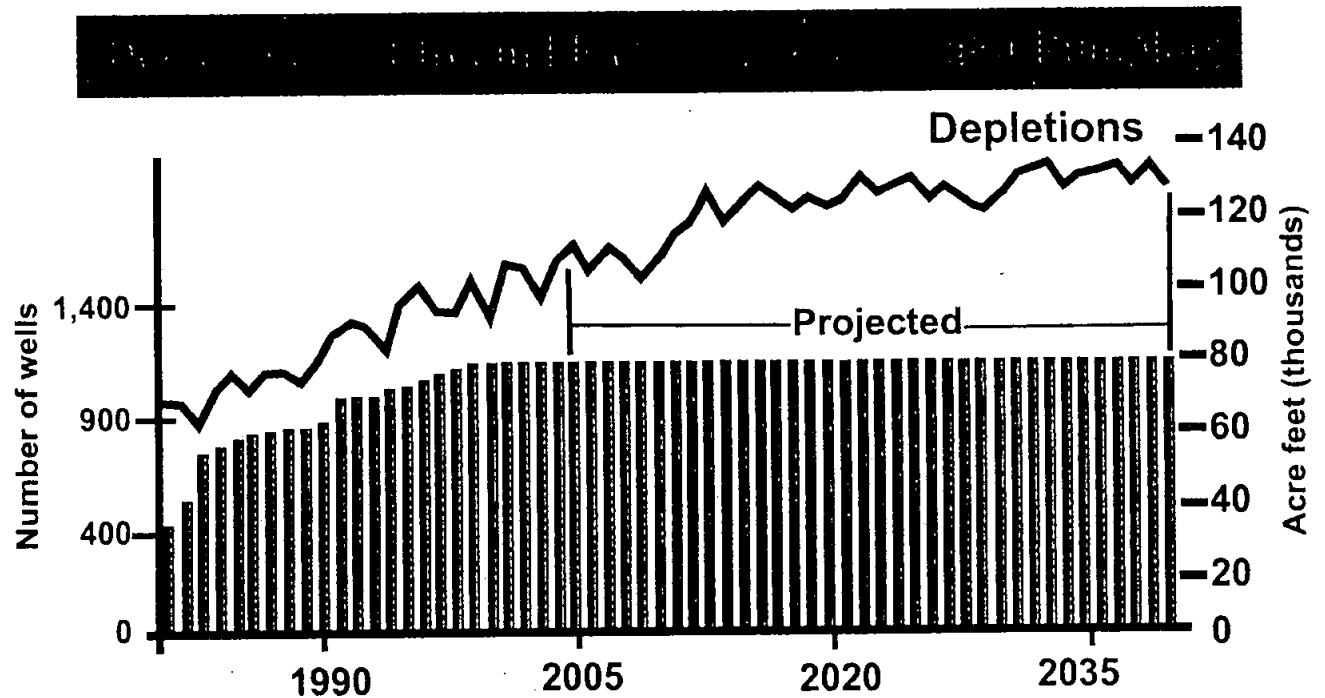
Thus, unless the actual consumption of water is decreased, increasing the efficiency of an irrigation system will not automatically decrease the consumptive use of water.

Of course, increasing the efficiency of an irrigation application system has many other benefits, such as decreasing fuel and fertilizer input costs and protecting water quality.

In summary, under LB 962 where groundwater and surface water are hydrologically connected, the stream-aquifer system must be treated as one integrated resource. It is clear that if water is consumed, water will be removed from the system. There is no free lunch.

It is equally clear that the physical differences in how the use of hydrologically connected surface water and groundwater impact the system require different management techniques.

The management tools for both groundwater and surface water must, however, be coordinated to reach the common goals and objectives for the combined resource.



Published by the
Nebraska Department of Natural Resources
 P.O. Box 94676
 Lincoln, Nebraska 68509-4676
 Phone; 402-471-2363
<http://www.dnr.state.ne.us>

October 2004

A good portion of this money will be earmarked to the NRDs for meters and additional staff. The remainder will go to DNR for work on the ground water model and other studies, gaging equipment and additional staff needed for data collection and analysis and Compact enforcement.

(Footnotes)

(1) Tri-Basin is not required under the Settlement Agreement to implement a moratorium.

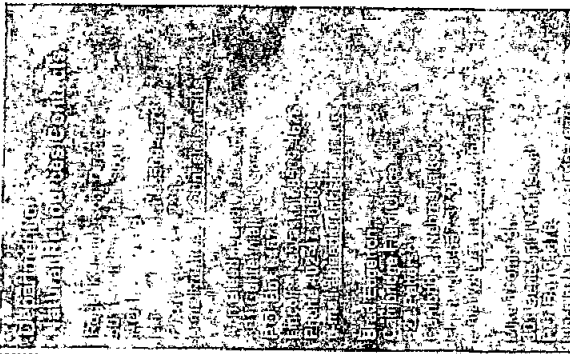
2003 will be the first year of operation under the settlement. DNR and the NRDS will be gathering detailed information this summer and fall. This information includes number of acres and type of crop irrigated by each surface water permit and ground water well, amount of water pumped, and the type of application system used. Additional data will include the evaporation from reservoirs with a capacity of over 15 acre feet, municipal and industrial uses. Good information will be critical to Nebraska in assuring the accuracy of the ground water model and Compact accounting. Accurate data will allow Nebraska to receive the most water possible under the Compact.

In 2003:

- DNR will close junior diverters between Harlan County Dam and Guide Rock
- The three states will complete the joint ground water model
- DNR and the NRDs will collect detailed information on water use in Nebraska
- Meters will continue to be installed
- The NRDs will certify irrigated acres
- A joint system improvement study will be initiated

Visit DNR's website for additional information

<http://www.dnr.state.ne.us>



Contacts

Upper Republican NRD

Robert Hippie, Manager
135 West 5th Street
P.O. Box 1140
Imperial, NE 69033
Phone: 308-882-5173
or 308-882-5584
Fax#: 308-892-4521
e-mail: urrd@tribasinnrd.org

Middle Republican NRD

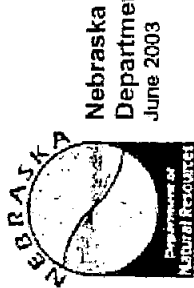
Dan Smith, Manager
220 Center Street
P.O. Box 81
Curtis, NE 69025
Phone: 308-367-4281
Toll-Free: 1-800-873-5613
Fax#: 308-367-4285
e-mail: dsmith@mmrd.org
web: www.mmrd.org

Lower Republican NRD

Michael Clements, Manager
Harlan County Courthouse
706 - 2nd Street
P.O. Box 618
Alma, NE 68920
Phone: 308-928-2182
Toll-Free: 1-800-353-1297
Fax#: 308-928-2317
e-mail: lrnrds@tribasinnrd.org

Tri-Basin NRD

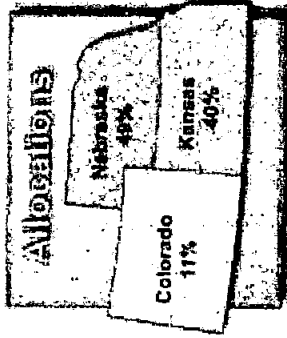
John Thorburn, Manager
Plymouth County Ag Center
1308 - 2nd Street
Holdrege, NE 68949
Phone: 308-995-6688
Toll-Free: 1-877-995-6688
Fax#: 308-995-6992
e-mail: tribasinnrd.org
web: tribasinnrd.org



**Summary of
Republican River Compact
Litigation Settlement**

On December 16, 2002 Governor Mike Johanns and Attorney General Don Stenberg announced that Nebraska reached an out-of-court settlement of the U. S. Supreme Court case, Kansas v. Nebraska.

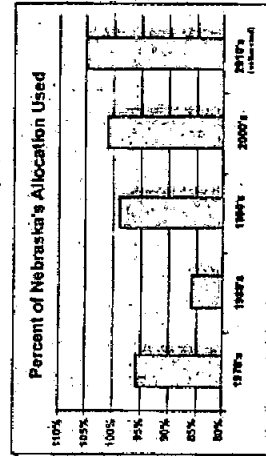
Colorado, concerning the Republican River Compact. In May, 2003 the Supreme Court approved the settlement. The Compact, signed in 1943 by the three basin States, allocates the average annual water supply of the Republican River, 11% to the State of Colorado, 49% to Nebraska and 40% to Kansas. Under the Compact, the total allocation given to each State is to be derived from the listed tributaries, and for Nebraska and Kansas, from the mainstream of the Republican River.



The settlement does not change the original compact among the states, or the percentages of water supply allocated to each state by the original compact. However, the amount of water allocated to each State varies annually depending on stream flows in nine specifically identified tributaries, all other small tributaries and the mainstream of the Republican River.

Each State is entitled to consume its allocation.

In May, 1998 the State of Kansas filed complaint with the U. S. Supreme Court alleging that Nebraska violated the Compact "by allowing the proliferation and use of thousands of wells hydraulically connected to the Republican River and its tributaries, by the failure to protect surface

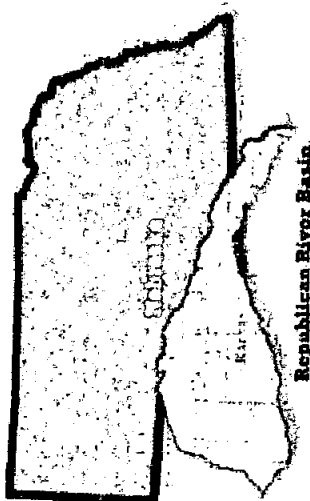


flows from unauthorized appropriation by Nebraska users, and by other acts and omissions."

In June, 1999 the United States Supreme Court invited Nebraska to file a motion to dismiss the case on the question of whether the Compact restricted the use of ground water. Kansas argued that the Compact restricts all ground water use. Nebraska argued that the Compact only restricts the consumption of water directly diverted from the streams. Colorado stated that the Compact restricts the pumping of alluvial ground water, but not table-land ground water. Alluvial ground water is generally closely connected to streamflow. Pumping from the alluvium causes a relatively immediate depletion to the surface water flows.

On November 15, 1999 the Court referred the matter to Special Master Vincent L. McKusick. On January 28, 2000 the Special Master issued his First Report stating that the Republican River Compact restricts a compacting State's consumption of ground water to the extent that such consumption depletes stream flow in the Republican River Basin. McKusick's ruling made it clear that both upland and alluvial wells were to be counted if they deplete streamflow. Among the remaining issues in the case were: 1) Did Nebraska overuse water and if so, was Kansas entitled to any damages resulting from Nebraska's overuse of water, 2) Do the states have the flexibility to use the water allocated from one sub-basin in other parts of the state;

3) Is compliance based on an annual accounting of allocations and use or can it be based on an average over a number of years; 4) What is Kansas's entitlement to water at the Guide Rock diversion dam, which diverts water to the Kansas Bostwick Irrigation District; and 5) Can Nebraska receive credit for water imported into the basin as a result of the Central Nebraska Public Power and Irrigation District's



and Nebraska Public Power District's projects. In May 2001 Special Master McKusick issued additional rulings, which helped set the stage for a negotiated settlement. In October, 2001 the three States began settlement discussions. As a result of these initial discussions, Special Master McKusick postponed parts of the progression of the litigation until December 15, 2002 to allow time for continued settlement negotiations.

The U. S. Department of Justice, U. S. Bureau of Reclamation and the U. S. Army Corps of Engineers also participated in the settlement negotiations. Nebraska's settlement team consisted of David Cookson, Assistant Attorney General, and Roger Patterson, Ann Bleed and Jim Cook from the Department of Natural Resources (DNR). The settlement team was assisted by a number of attorneys and consultants including Nebraskans Don Blankenau from the law firm of Fenmore Craig, Tom Riley from The Flatwater Group consulting firm and Derrel Martin from the University of Nebraska.

The seventeen months of negotiations, which took place mostly in Denver or Kansas City, were intense and time consuming, but in the end the states achieved a settlement package that has been described as a win-win by all three states.

The Settlement Agreement substantially meets the key objectives Nebraska hoped to achieve at trial while avoiding the uncertainty and expenses that would be involved in protracted litigation. The Settlement Agreement:

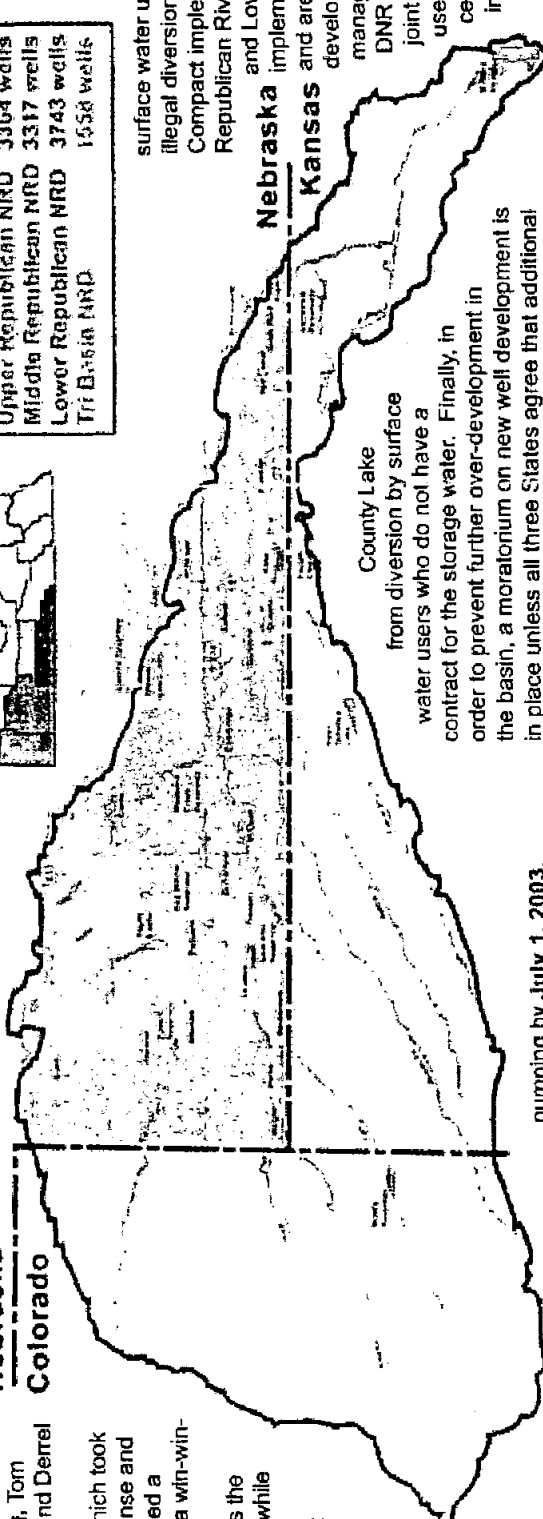
1. Counts all ground water use that is determined to deplete stream flow as part of a State's consumptive use;
2. Waives and forever bars all past claims for damages;
3. Gives Nebraska the flexibility to use its allocation wherever it sees fit;
4. Increases flexibility further by measuring Compact compliance on a five-year running average, as opposed to annually, except in dry years when compliance is measured on a two or three-year running average basis.

Since the 1950s the Compact has been administered by the Republican River Compact Administration, consisting of the State Engineers from Colorado and Kansas and the Director of DNR in Nebraska. The Settlement Agreement continues this administration. The Compact accounting in the past has included the consumptive use of water from surface water and alluvial ground water for irrigation, municipal and industrial uses, as well as the evaporation from the Bureau of Reclamation reservoirs. These calculations will continue, but evaporation from small reservoirs of 15 acre-feet or more and depletions to stream flow caused by all ground water use including from upland wells will now

also be included in the calculations. The Settlement Agreement also provides that Nebraska will get credit for any water imported into the basin as a result of surface water projects on the Platte River. The inclusion of stream flow depletions resulting from all groundwater use that depletes streamflow and credits from the Platte River surface water projects requires that the Compact Administration develop a basin-wide ground water model. The three States have agreed to complete a mutually acceptable ground water model to compute depletions to streamflow from ground water

Republican River Basin

Nebraska
Colorado



cannot use water allocated from Beaver Creek in another sub-basin.

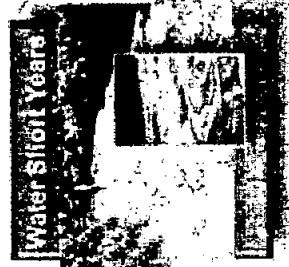
Also in water short years, when the Bostwick irrigation districts supply is less than 130,000 acre feet to assure Compact compliance Nebraska has agreed to shut off all surface water users between Harlan County Lake and Guide Rock that are junior to February 26, 1948, the priority date of the Nebraska Courtland Canal which also serves the Kansas Bostwick Irrigation District. Nebraska will also protect any storage water released from Harlan

Registered Irrigation Wells by NRD within the Republican Basin	
Upper Republican NRD	3364 wells
Middle Republican NRD	3317 wells
Lower Republican NRD	1558 wells

Nebraska
Kansas

County Lake from diversion by surface water users who do not have a contract for the storage water. Finally, in order to prevent further over-development in the basin, a moratorium on new well development is in place unless all three States agree that additional development is possible within a State's allocation. It is expected that Nebraska should be able to maintain most, if not all, of its existing uses in normal years. In water short years, which occur 25% - 33% of the time, Nebraska will have to reduce consumptive use to stay in compliance with the Compact.

In addition, the Settlement Agreement includes provisions that lay out a dispute resolution process that the States hope will decrease the need for future litigation. The settlement also provides that the states and the U. S. Bureau of Reclamation will jointly study and, if possible, develop system improvements to make more efficient use of the water that is available in the basin. It also calls for a five year study of the impact of small ponds and terraces on stream flow. While all three States continue to agree not to include the consumptive use from these conservation



Water Short Years

activities in Compact accounting, they agree that it would be useful to know how these activities impact the basin's water supplies. The majority of the costs for this study will be funded by the federal government.

Under the Settlement Agreement, Compact compliance will first be measured in 2007, unless we have a water-short year, in which case compliance will start in 2006. This will give Nebraska time to implement new rules and regulations necessary for Compact compliance. It is important to note that the years counting toward the five-year running average that starts counting in 2007 include 2003.

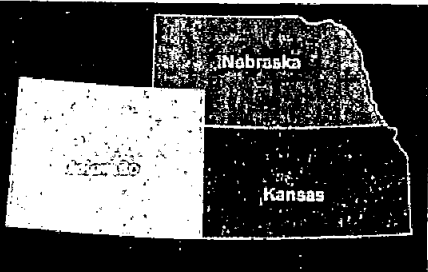
Although the Settlement negotiations were difficult, in many ways the really hard work of implementing the settlement is yet to come. Nebraska, through DNR and the Republican River Basin NRDs, will be responsible for collecting its portion of the necessary data for Compact accounting. DNR will also be responsible for regulating surface water uses and protecting storage water from illegal diversions. A significant portion of the new Compact implementation responsibilities will fall to the Republican River Basin NRDs. The Upper, Middle, and Lower Republican NRDs have already

implemented moratoriums on new wells (1) and are in the process of working with DNR to develop integrated surface and ground water management joint action plans. The NRDs and DNR will have to work closely to coordinate the joint regulation of surface and ground water uses. The NRDs will need to identify and certify the number of acres currently being irrigated by wells. To accurately measure use, all wells need to be metered and the NRDs will make sure the meter data is accurate. The NRDs will enforce their joint action ground water management plans to insure that ground water users use only the water allowed under the management plan. Finally, the NRDs and DNR will work together to gather the significant amount of

ground water data needed to assure the greatest possible accuracy from the Republican River ground water model. The implementation of the Settlement Agreement will require Nebraska to fund activities necessary to keep Nebraska in Compact compliance. For this reason, the Legislature has provided additional money to carry out the requirements of the Settlement Agreement.

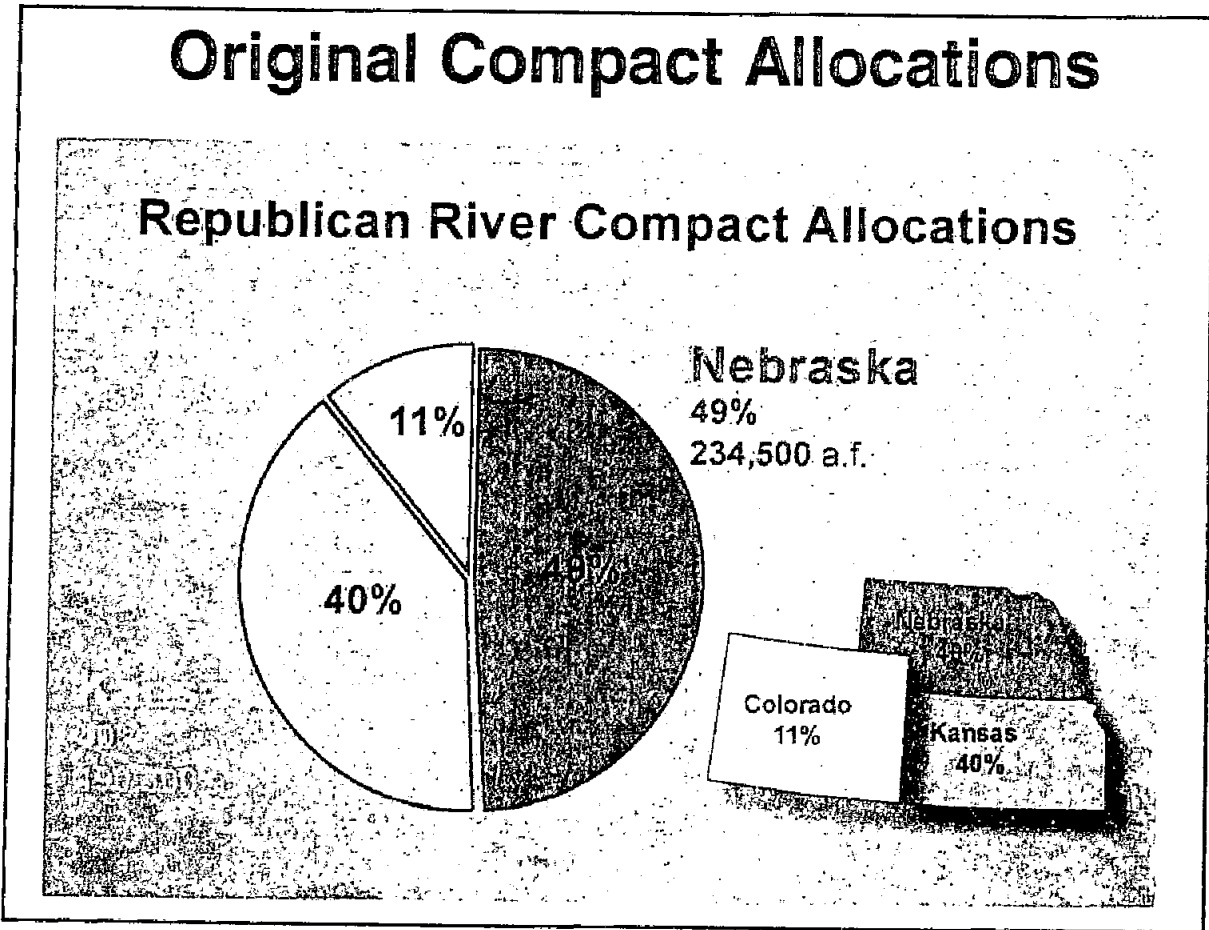


Registered Irrigation Wells in the Republican Basin

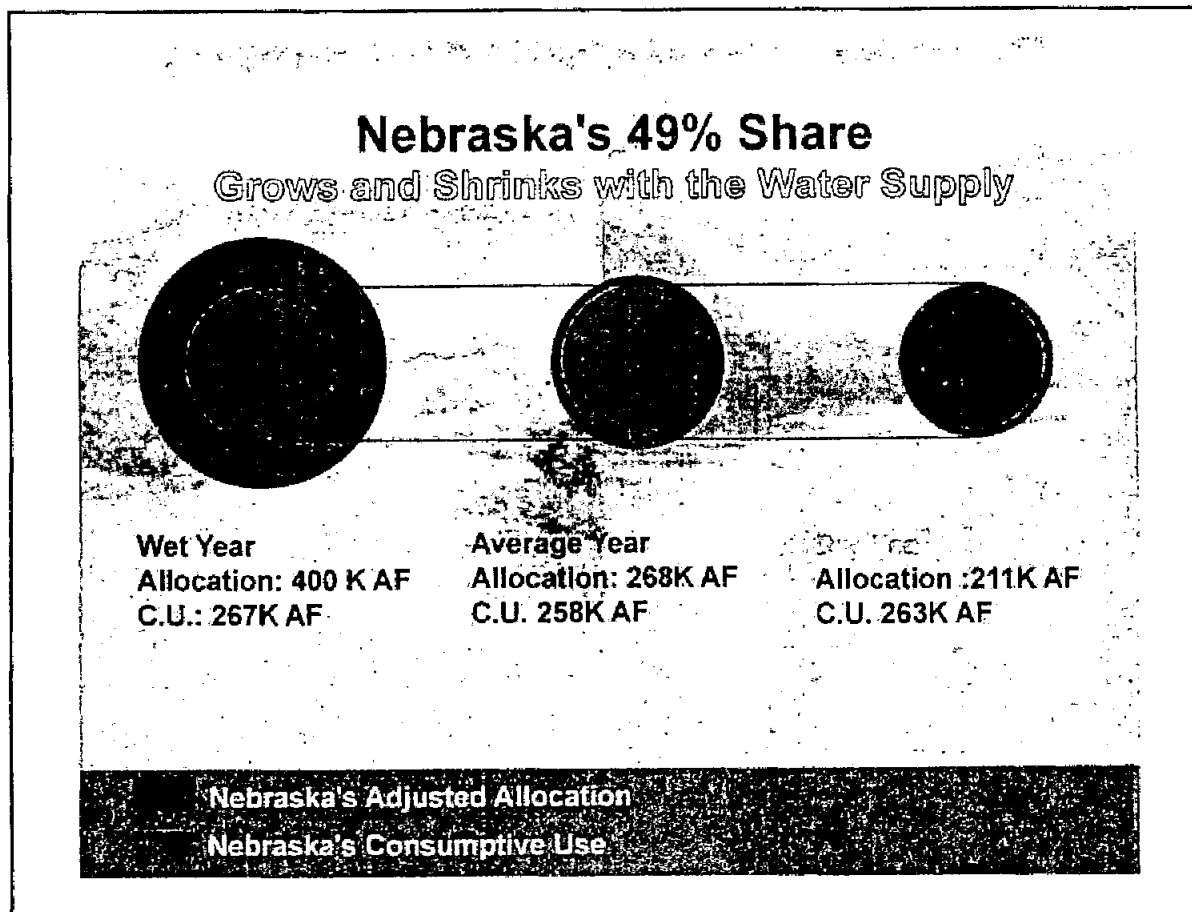


The Republican River Compact

- Signed and Ratified by Congress – 1943
- Divided the waters of the river between Nebraska, Kansas, and Colorado
- “Virgin water supply” is allocated to states for Beneficial Consumptive Use



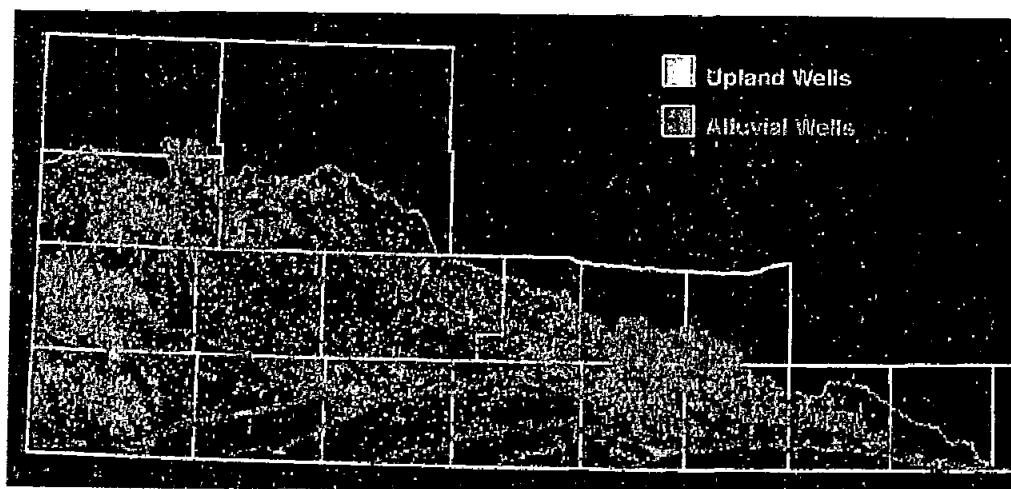
**Beneficial Consumptive Uses
historically included
uses from
surface water and
alluvial groundwater
only**

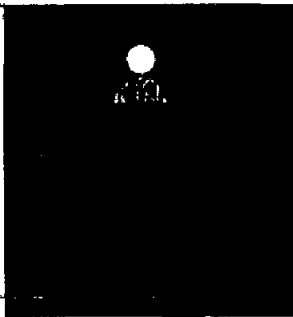


Kansas Files Lawsuit

- **Kansas filed suit in May 1998**
- **Major points of Contention**
 - Proliferation of well development in Nebraska
 - Chronic overuse by Nebraska in several subbasins
 - Damages for this overuse

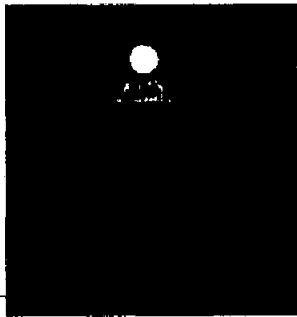
Alluvial/Upland Wells





Rulings by Special Master

- **Groundwater use counts to the extent it depletes streamflow – Jan. 2000**
 - i.e. includes upland wells
- **Compact accounting numbers for 1959-1994 are binding and will not be changed – May 2001**
 - i.e. Kansas cannot expect to receive large award for damages



Rulings by Special Master

**Set the stage for possible
settlement of remaining
technical issues**

Compact Not Changed by Settlement

- Still calculate Virgin Water Supply by Subbasin
- Still allocate supplies to each state by subbasin – percent allocated to each state not changed by settlement
- Still calculate consumptive use by subbasin
- Still require states to consume no more than allocated

Compact Designated Sub-Basins

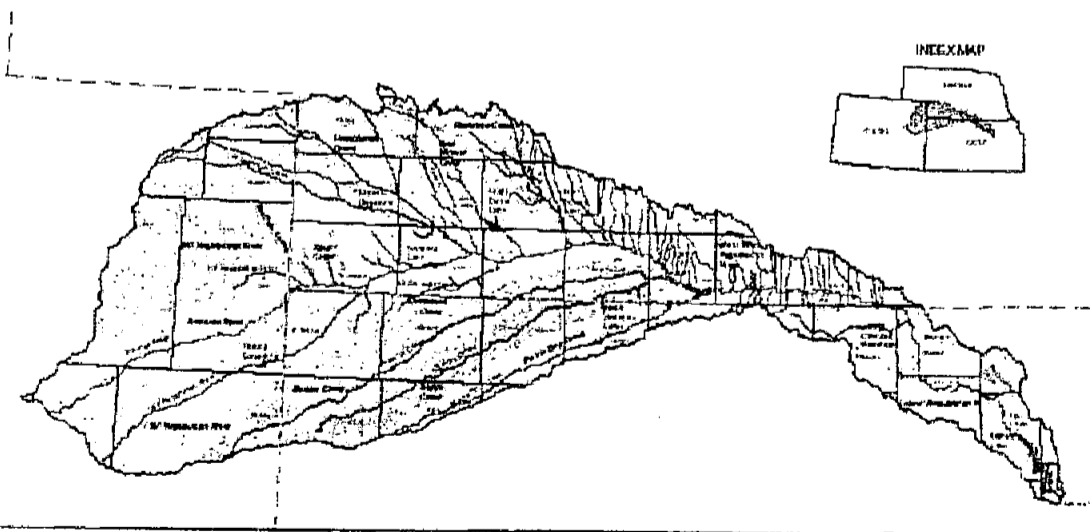


Table 2: Original Compact Virgin Water Supply and Allocations

Basin	Virgin Water Supply	Colorado Allocation	% of Basin Supply	Kansas Allocation	% of Basin Supply	Nebraska Allocation	% of Basin Supply	Unallocated	% of Basin Supply
North Fork	44,700	10,000	22.4%			11,000	24.6%	23,700	53.0%
Arikaree	19,810	15,400	78.5%	1,000	5.1%	3,300	16.8%	-90	-0.4%
Buffalo	7,890					2,600	33.0%	5,290	67.0%
Rock	11,000					4,400	40.0%	6,600	60.0%
South Fork	57,200	25,400	44.4%	23,000	40.2%	800	1.4%	8,000	14.0%
Frenchman	98,500					52,800	53.6%	45,700	46.4%
Driftwood	7,300			500	6.9%	1,200	16.4%	5,600	76.7%
Red Willow	21,900					4,200	19.2%	17,700	80.8%
Medicine	50,800					4,600	9.1%	46,200	90.9%
Beaver	16,500	3,300	20.0%	6,400	38.8%	6,700	40.6%	100	0.6%
Sappa	21,400			8,800	41.1%	8,800	41.1%	3,800	17.8%
Prairie Dog	27,600			12,600	45.7%	2,100	7.6%	12,900	46.7%
Tributaries Sub Total	384,000							175,500	
Main Stem	94,500								
Main Stem + Unallocated	270,000			138,000	51.1%	132,000	48.9%		
Total	478,900	54,100		190,300		234,500			

As Result of Litigation

- Now clear all wells in basin included in calculating consumptive use to the extent they deplete stream flow
- Requires a ground water model to calculate depletions
- Official RRCA Model developed jointly by three states with assistance by USGS

2002 Settlement Provided More Specific Rules for Determining Compliance

- Compliance not based on subbasin by subbasin comparison of allocation and CU –

Based on totals for state – allows overuse in one subbasin to be offset by under use in another

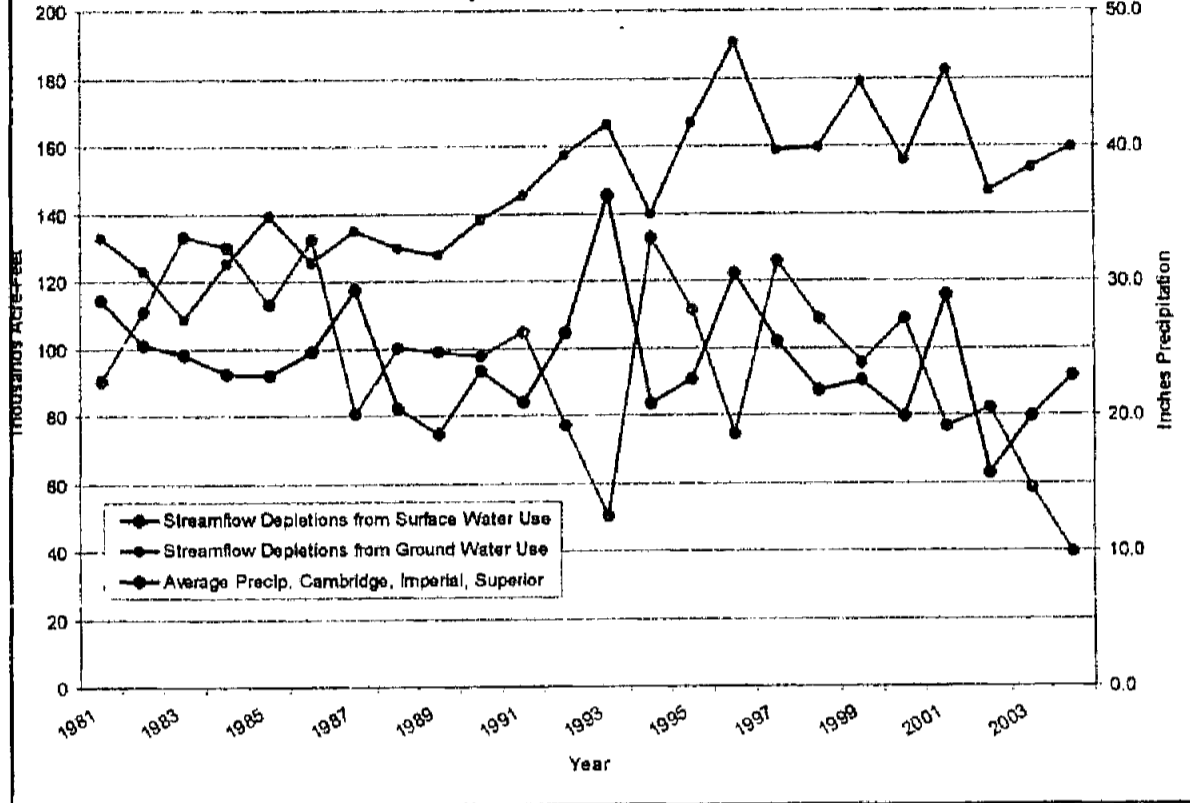
- Compliance not based on annual allocations and use –

Based on five-year running average

Table 1: Annual Virgin and Computed Water Supply, Allocations, and Computed Beneficial Consumptive Uses by State

2004 Basin	Virgin Water Supply	Computed Water Supply	Allocations			
			Colorado	Kansas	Nebraska	Unallocated
North Fork	42,380	42,380	9,490	0	10,430	22,460
Arikaree	1,280	1,280	1,000	70	220	-10
Buffalo	6,170	6,170	0	0	2,040	4,130
Rock	9,130	9,130	0	0	3,650	5,480
South Fork	21,190	24,090	10,700	9,680	340	3,370
Frenchman	116,020	115,720	0	0	62,030	53,690
Driftwood	2,710	2,710	0	190	440	2,080
Red Willow	16,850	14,050	0	0	2,700	11,350
Medicine	37,260	37,560	0	0	3,420	34,140
Beaver	1,870	1,870	370	730	760	10
Sappa	590	590	0	240	240	110
Prairie Dog	3,750	4,750	0	2,170	360	2,220
Main Stem	102,080	104,380	0	53,340	51,040	0
Total All Basins	361,280	364,680	21,560	66,420	137,670	139,030
Main Stem including Unallocated		243,410	0	124,380	119,030	
Total	361,280	364,680	21,560	137,460	205,660	0

Nebraska Republican Basin Stream Depletions and Average Precipitation, 1981-2004



Must consider variation of precipitation across basin when developing compliance requirements

Average Annual Precipitation
Nebraska



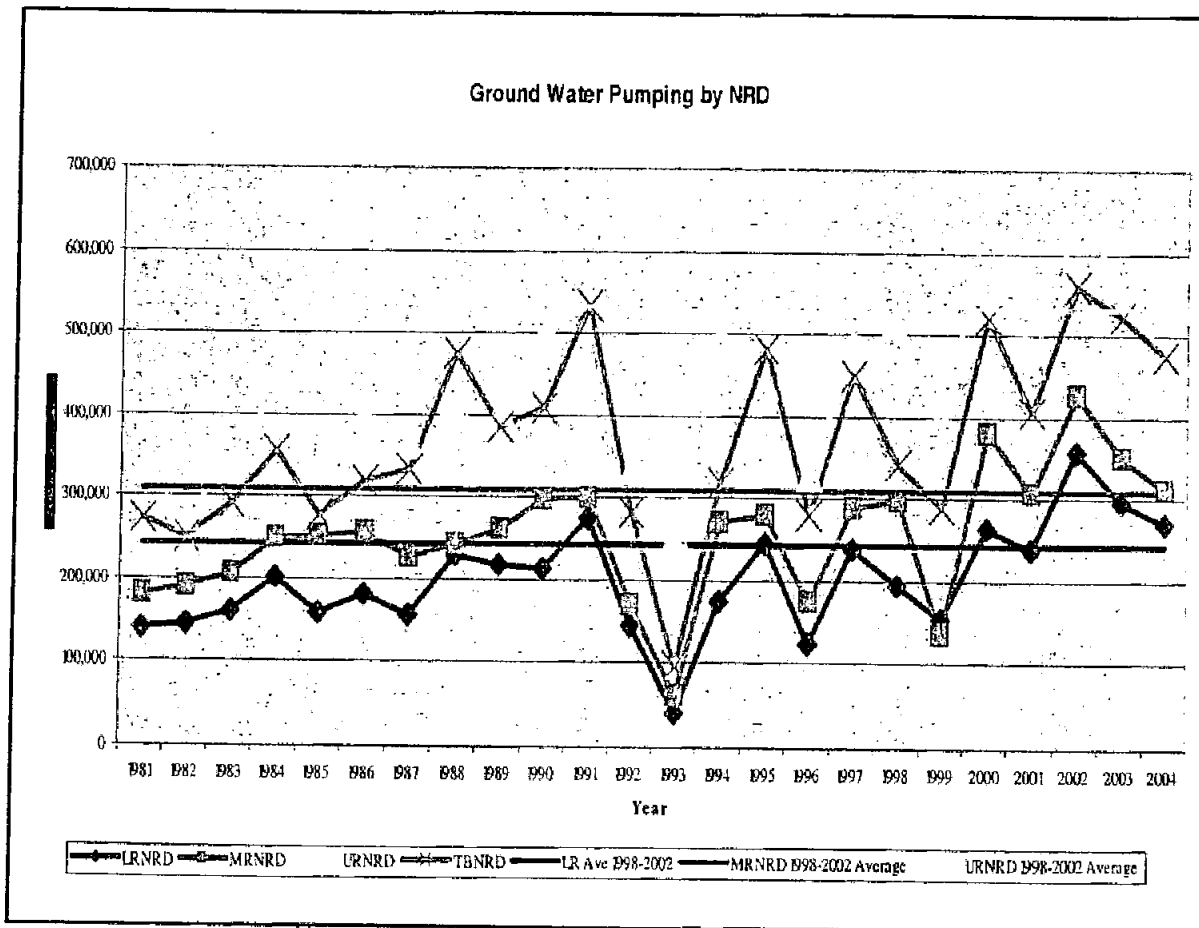
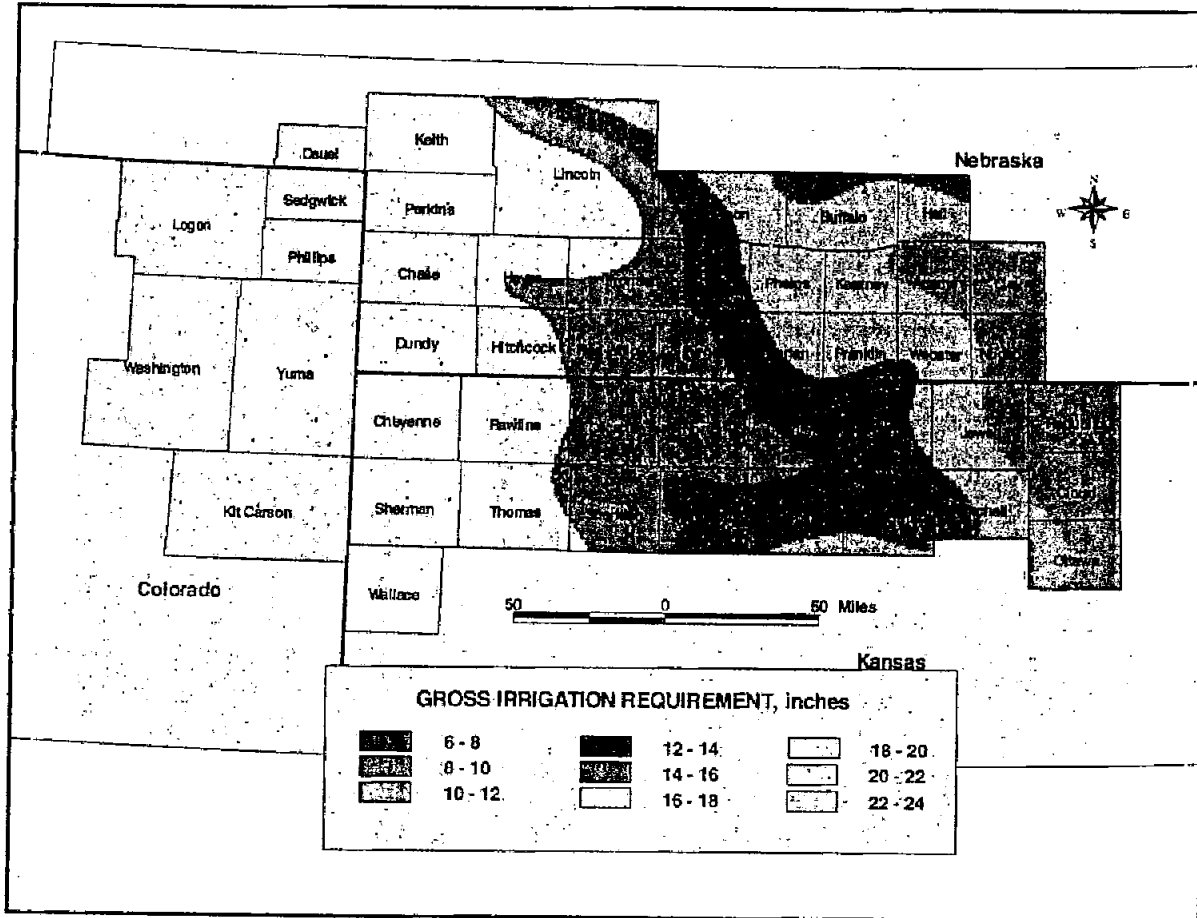
Legend (in inches)

Under 16	20 to 28
16 to 18	28 to 30
18 to 20	30 to 32
20 to 22	32 to 34
22 to 24	Above 34
24 to 26	

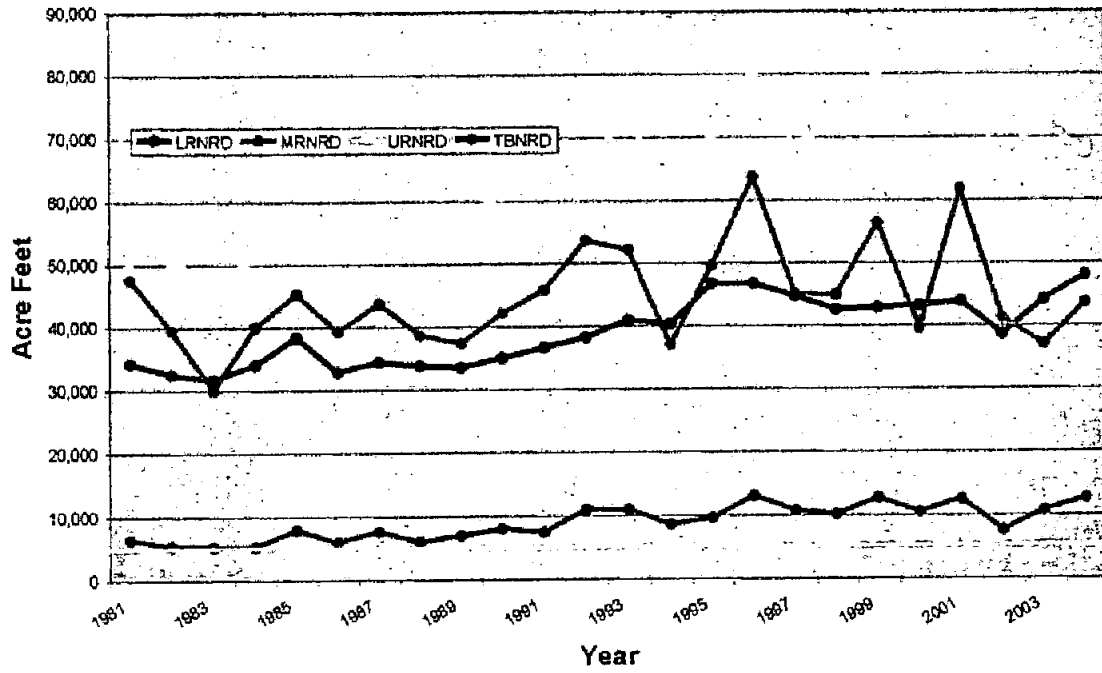
Period: 1961-1990

Oregon Climate Service
Oregon State University

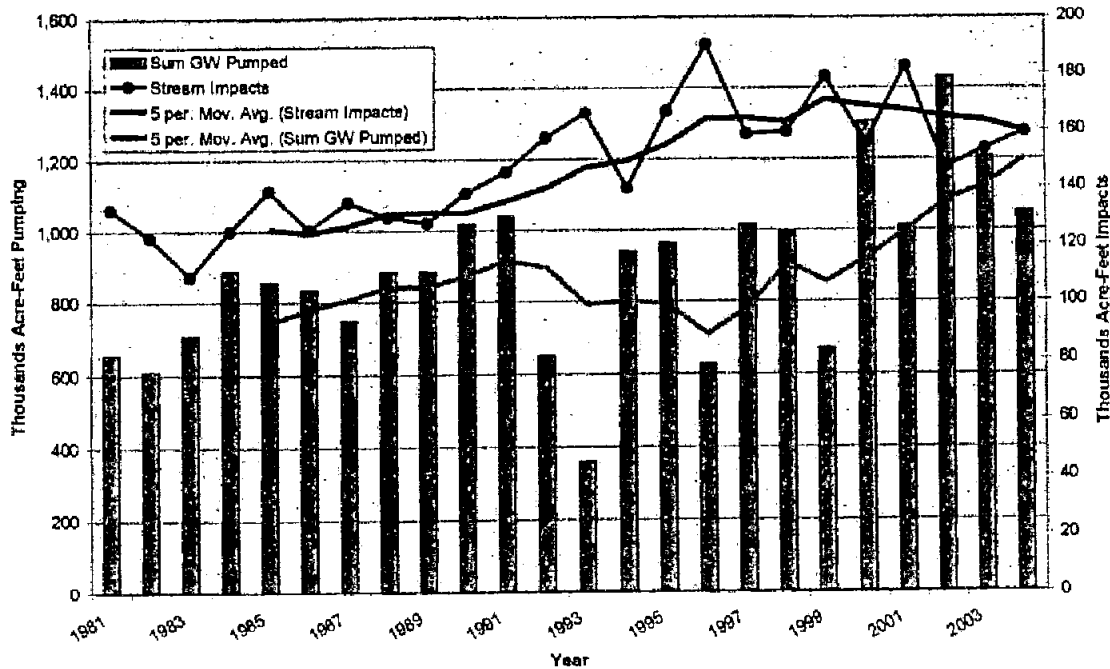
This map is a plot of 1961-1990 annual average precipitation contours from NOAA Cooperative stations and (where appropriate) USDA-NRCS SNOTEL stations. Christopher Day used the PRISM model to generate the gridded estimates from which this map was derived. The modeled grid was approximately 4.6 km latitude/longitude, and was resampled to 2x2 km using a Gaussian filter. Mapping was performed by Janny Weisberg and Nathaniel DeYoung. Funding was provided by USDA-NRCS National Water and Climate Center.



Groundwater Depletions to Streams by NRD



Sum Republican Basin Pumping -vs- Stream Impacts



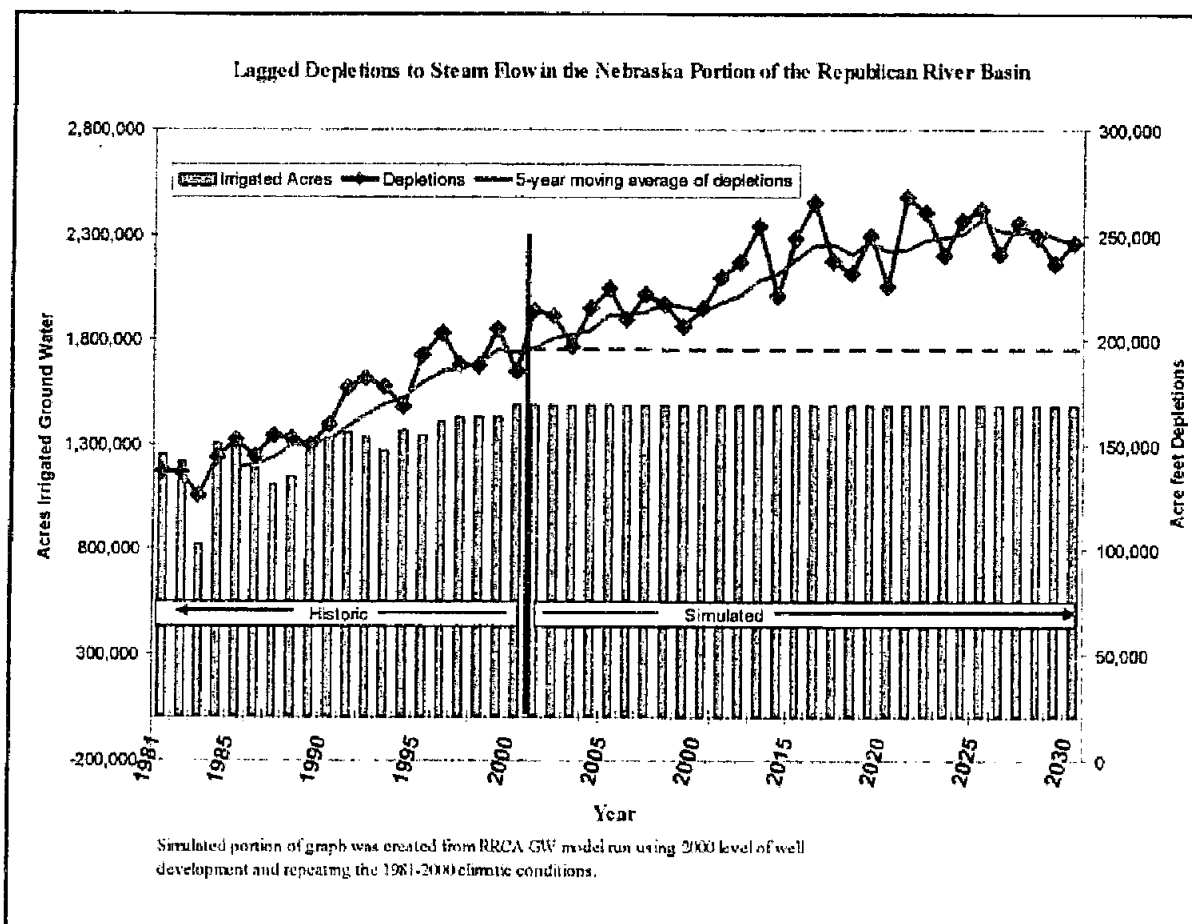
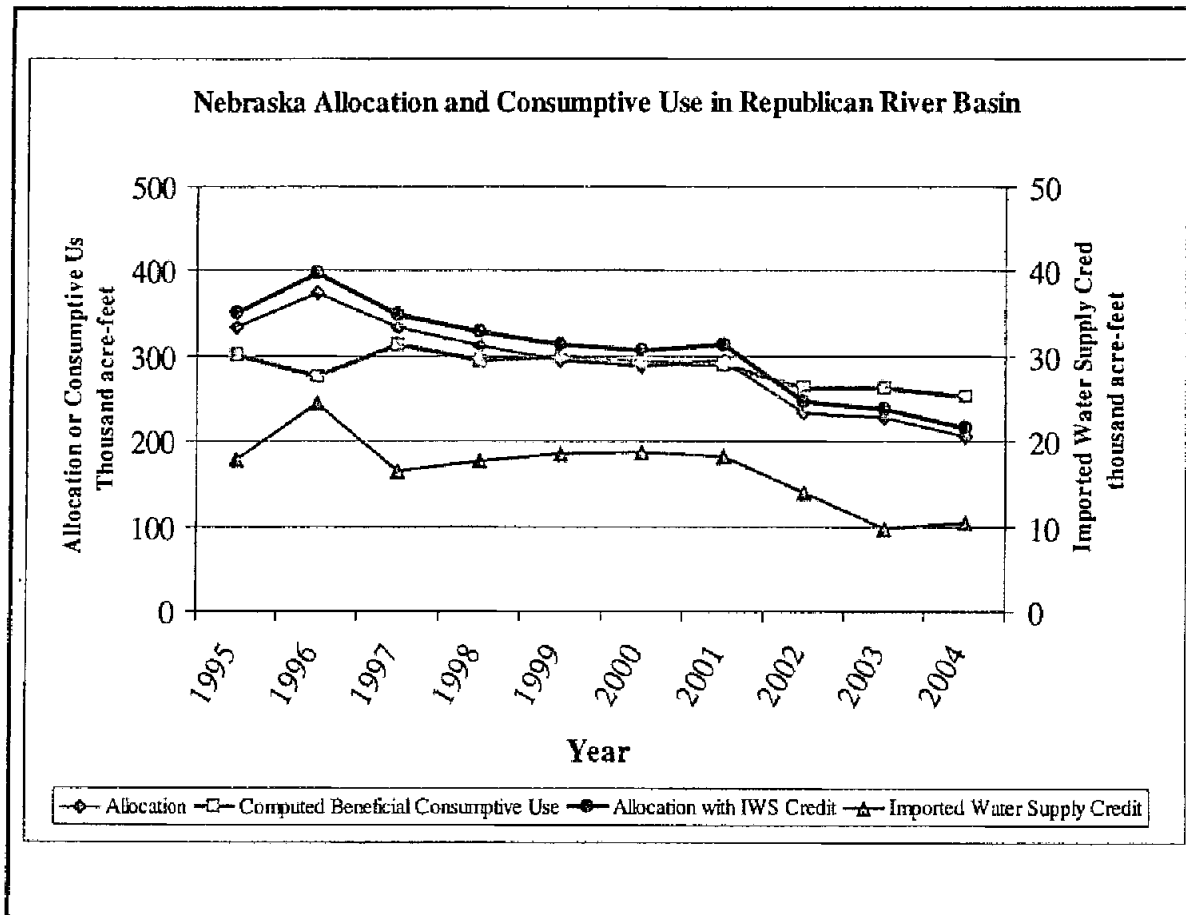


Table 1: Annual Virgin and Computed Water Supply, Allocations, and Computed Beneficial Consumptive Uses by State

2004 Basin	Virgin Water Supply	Computed Water Supply	Allocations			
			Colorado	Kansas	Nebraska	Unallocated
North Fork	42,380	42,380	9,490	0	10,430	22,460
Arikaree	1,280	1,280	1,000	70	220	-10
Buffalo	6,170	6,170	0	0	2,040	4,130
Rock	9,130	9,130	0	0	3,650	5,480
South Fork	21,190	24,090	10,700	9,680	340	3,370
Frenchman	116,020	115,720	0	0	62,030	53,690
Driftwood	2,710	2,710	0	190	440	2,080
Red Willow	16,850	14,050	0	0	2,700	11,350
Medicine	37,260	37,560	0	0	3,420	34,140
Beaver	1,870	1,870	370	730	760	10
Sappa	590	590	0	240	240	110
Prairie Dog	3,750	4,750	0	2,170	360	2,220
Main Stem	102,080	104,380	0	53,340	51,040	0
Total All Basins	361,280	364,680	21,560	66,420	137,670	139,030
Main Stem Including Unallocated		243,410	0	124,380	119,030	
Total	361,280	364,680	21,560	137,460	205,660	0

Table 3A: Colorado's Five-Year Average Allocation

Year	Allocation	Computed Beneficial Consumptive Use	Imported Water Supply Credit	Allocation - (CBCU - IWS Credit)
2003	21,420	33,470	NA	-12,050
2004	0	0	NA	0
2005			NA	
2006			NA	
2007			NA	
Average	10,710	16,740		-6,030

Table 3B: Kansas's Five-Year Average Allocation

Year	Allocation	Computed Beneficial Consumptive Use	Imported Water Supply Credit	Allocation - (CBCU - IWS Credit)
2003	167,780	48,910	NA	118,870
2004	0	0	NA	0
2005			NA	
2006			NA	
2007			NA	
Average	83,890	24,460		59,440

Table 3C: Nebraska's Five-Year Average Allocation

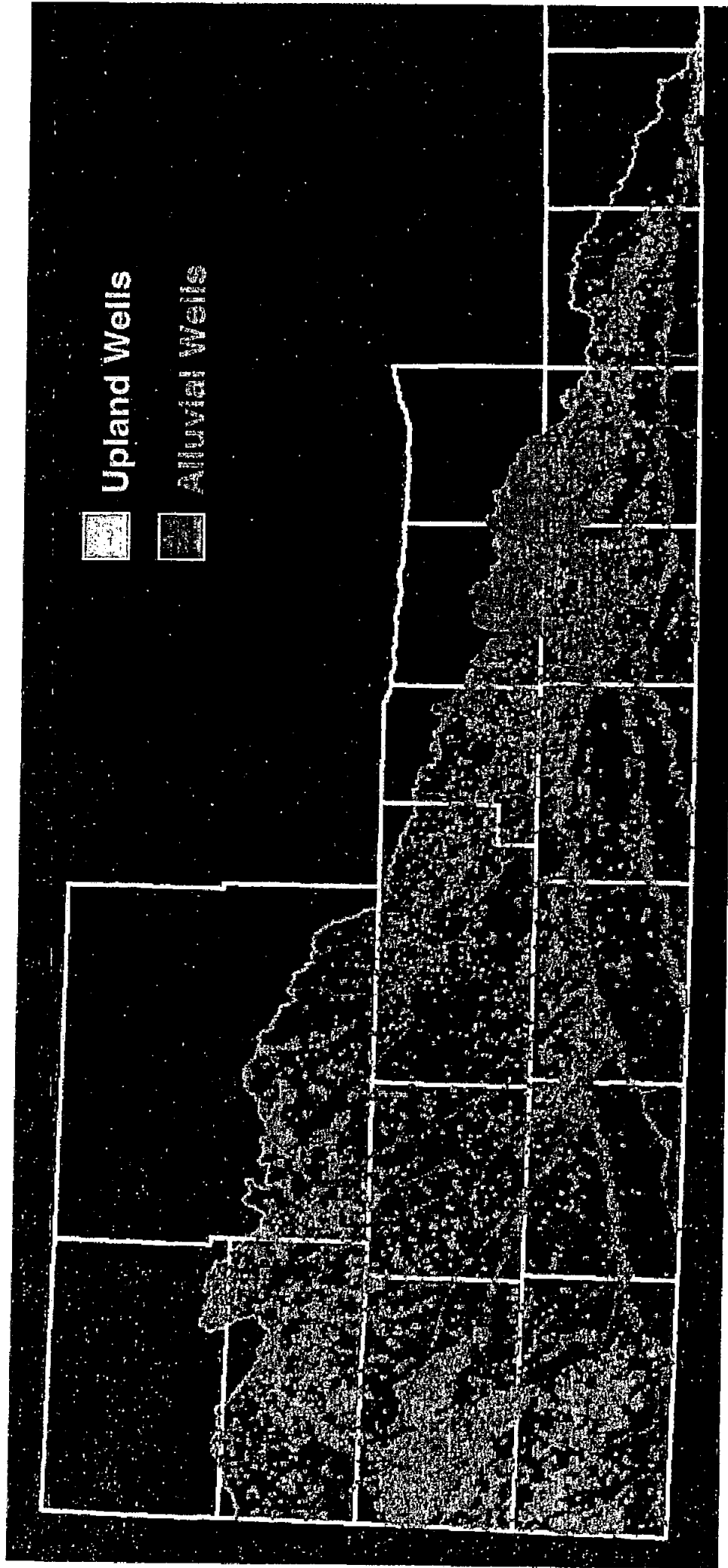
Year	Allocation	Computed Beneficial Consumptive Use	Imported Water Supply Credit	Allocation - (CBCU - IWS Credit)
2003	227,580	262,780	9,780	-25,420
2004	0	0	2,889	2,889
2005				
2006				
2007				
Average	113,790	131,390	6,330	-11,270

get correct #s from NAT

Future Noncompliance with the Compact will Result in

- **New lawsuit against Nebraska**
- **Payment of either money or water or both if Nebraska has used more than their allocation and violated the Compact**
- **Possible imposition of rules and regulations to insure Compact Compliance by the U. S. Supreme Court**

Alluvial/Upland Wells



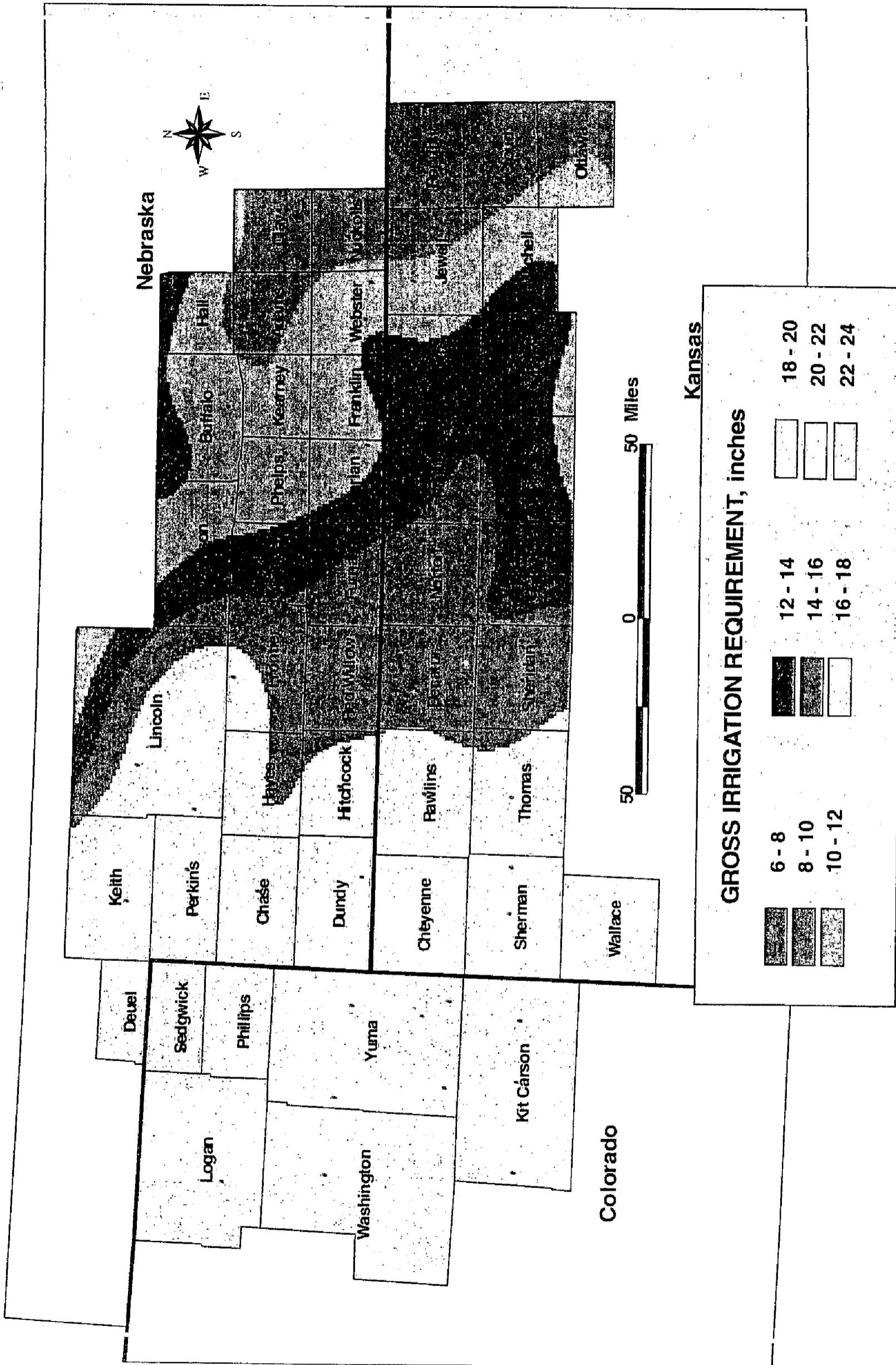


Table 1: Annual Virgin and Computed Water Supply, Allocations, and Computed Beneficial Consumptive Uses by State

2004 Basin	Virgin Water Supply	Computed Water Supply	Allocations				Unallocated
			Colorado	Kansas	Nebraska		
North Fork	42,380	42,380	9,490	0	10,430		22,460
Arikaree	1,280	1,280	1,000	70	220		-10
Buffalo	6,170	6,170	0	0	2,040		4,130
Rock	9,130	9,130	0	0	3,650		5,480
South Fork	21,190	24,090	10,700	9,680	340		3,370
Frenchman	116,020	115,720	0	0	62,030		53,690
Driftwood	2,710	2,710	0	190	440		2,080
Red Willow	16,850	14,050	0	0	2,700		11,350
Medicine	37,260	37,560	0	0	3,420		34,140
Beaver	1,870	1,870	370	730	760		10
Sappa	590	590	0	240	240		110
Prairie Dog	3,750	4,750	0	2,170	360		2,220
Main Stem	102,080	104,380	0	53,340	51,040		0
Total All Basins	361,280	364,680	21,560	66,420	137,670		139,030
Main Stem Including Unallocated		243,410	0	124,380	119,030		
Total	361,280	364,680	21,560	137,460	205,660		0

Table 3A: Colorado's Five-Year Average Allocation and CBCU

Year	Allocation	Computed Beneficial Consumptive Use	Imported Water Supply Credit	Allocation - (CBCU - IWS Credit)
2003	21,420	33,470	NA	-12,050
2004	21,560	33,690	NA	-12,130
2005			NA	
2006			NA	
2007			NA	
Average	21,490	33,580		-12,090

Table 3B: Kansas's Five-Year Average Allocation and CBCU

Year	Allocation	Computed Beneficial Consumptive Use	Imported Water Supply Credit	Allocation - (CBCU - IWS Credit)
2003	167,780	48,910	NA	118,870
2004	137,460	38,120	NA	99,340
2005			NA	
2006			NA	
2007			NA	
Average	152,620	43,520		109,110

Table 3C: Nebraska's Five-Year Average Allocation and CBCU

Year	Allocation	Computed Beneficial Consumptive Use	Imported Water Supply Credit	Allocation - (CBCU - IWS Credit)
2003	227,580	262,780	9,780	-25,420
2004	205,660	252,690	10,381	-36,649
2005				
2006				
2007				
Average	216,620	257,740	10,080	-31,030

A1-106

REPUBLICAN RIVER COMPACT

AN ACT to ratify the compact entered into by the states of Colorado, Kansas and Nebraska on December 31, 1942, relating to the Republican River; to repeal Chapter 92, Session Laws of Nebraska, 1941; and to declare an emergency.

Be it enacted by the people of the State of Nebraska,

Section 1. The compact entered into on December 31, 1942, between the states of Colorado, Kansas and Nebraska, and in the formulation of which compact a representative of the President of the United States participated, respecting the waters of the Republican River, is ratified and approved in all respects and is as follows:

REPUBLICAN RIVER COMPACT

The States of Colorado, Kansas, and Nebraska, parties signatory to this compact (hereinafter referred to as Colorado, Kansas, and Nebraska, respectively, or individually as a State, or collectively as the States), having resolved to conclude a compact with respect to the waters of the Republican River Basin, and being duly authorized therefor by the Act of the Congress of the United States of America, approved August 4, 1942, (Public No. 696, 77th Congress, Chapter 545, 2nd Session) and pursuant to Acts of their respective Legislatures have, through their respective Governors, appointed as their Commissioners:

M.C. Hinderlider, for Colorado

George S. Knapp, for Kansas

Wardner G. Scott, for Nebraska

who, after negotiations participated in by Glenn L. Parker, appointed by the President as the Representative of the United States of America, have agreed upon the following articles:

ARTICLE I

The major purposes of this compact are to provide for the most efficient use of the waters of the Republican River Basin (hereinafter referred to as the "Basin") for multiple purposes; to provide for an equitable division of such waters; to remove all causes, present and future, which might lead to controversies; to promote interstate comity; to recognize that the most efficient utilization of the waters within the Basin is for beneficial consumptive use; and to promote joint action by the States and the United States in the efficient use of water and the control of destructive floods.

The physical and other conditions peculiar to the Basin constitute the basis for this compact, and none of the States hereby, nor the Congress of the United States by its consent, concedes that this compact establishes any general principle or precedent with respect to any other interstate stream.

ARTICLE II

The Basin is all the area in Colorado, Kansas, and Nebraska, which is naturally drained by the Republican River, and its tributaries, to its junction with the Smoky Hill River in Kansas. The main stem of the Republican River extends from the junction near Haigler, Nebraska, of its North Fork and the Arikaree River, to its junction with Smoky Hill River near Junction City, Kansas. Frenchman Creek (River) in Nebraska is a

continuation of Frenchman Creek (River) in Colorado. Red Willow Creek in Colorado is not identical with the stream having the same name in Nebraska. A map of the Basin approved by the Commissioners is attached and made a part hereof.

The term "Acre-foot," as herein used, is the quantity of water required to cover an acre to the depth of one foot and is equivalent to forty-three thousand, five hundred sixty (43,560) cubic feet.

The term "Virgin Water Supply," as herein used, is defined to be the water supply within the Basin undepleted by the activities of man.

The term "Beneficial Consumptive Use" is herein defined to be that use by which the water supply of the Basin is consumed through the activities of man, and shall include water consumed by evaporation from any reservoir, canal, ditch, or irrigated area.

Beneficial consumptive use is the basis and principle upon which the allocations of water hereinafter made are predicated.

ARTICLE III

The specific allocations in acre-feet hereinafter made to each State are derived from the computed average annual virgin water supply originating in the following designated drainage basins, or parts thereof, in the amounts shown:

North Fork of the Republican River drainage basin in Colorado, 44,700 acre-feet;

Arikaree River drainage basin, 19,610 acre-feet;

Buffalo Creek drainage basin, 7,890 acre-feet;

Rock Creek drainage basin, 11,000 acre-feet;

South Fork of the Republican River drainage basin, 57,200 acre-feet;

Frenchman Creek (River) drainage basin in Nebraska, 98,500 acre-feet;

Blackwood Creek drainage basin, 6,800 acre-feet;

Driftwood Creek drainage basin, 7,300 acre-feet;

Red Willow Creek drainage basin in Nebraska, 21,900 acre-feet;

Medicine Creek drainage basin, 50,800 acre-feet;

Beaver Creek drainage basin, 16,500 acre-feet;

Sappa Creek drainage basin, 21,400 acre-feet;

Prairie Dog Creek drainage basin, 27,600 acre-feet;

The North Fork of the Republican River in Nebraska and the main stem of the Republican River between the junction of the North Fork and the Arikaree River and the lowest crossing of the river at the Nebraska-Kansas state line and the small tributaries thereof, 87,700 acre-feet.

Should the future computed virgin water supply of any source vary more than ten (10) per cent from the virgin water supply as hereinabove set forth, the allocations hereinafter made from such source shall be increased or decreased in the relative proportions that the future computed virgin water supply of such source bears to the computed virgin water supply used herein.

ARTICLE IV

There is hereby allocated for beneficial consumptive use in Colorado, annually, a total of fifty-four thousand, one hundred (54,100) acre-feet of water. This total is to be derived from the sources and in the amounts hereinafter specified and is subject to such quantities being physically available from those sources:

North Fork of the Republican River drainage basin,

10,000 acre-feet;

Arikaree River drainage basin, 15,400 acre-feet;

South Fork of the Republican River drainage basin,
25,400 acre-feet;

Beaver Creek drainage basin, 3,300 acre-feet; and

In addition, for beneficial consumptive use in Colorado, annually, the entire water supply of the Frenchman Creek (River) drainage basin in Colorado and of the Red Willow Creek drainage basin in Colorado.

There is hereby allocated for beneficial consumptive use in Kansas, annually, a total of one hundred ninety thousand, three hundred (190,300) acre-feet of water. This total is to be derived from the sources and in the amounts hereinafter specified and is subject to such quantities being physically available from those sources:

Arikaree River Drainage Basin, 1,000 acre-feet;

South Fork of the Republican River drainage basin,
23,000 acre-feet;

Driftwood Creek drainage basin, 500 acre-feet;

Beaver Creek drainage basin, 6,400 acre-feet;

Sappa Creek drainage basin, 8,800 acre-feet;

Prairie Dog Creek drainage basin, 12,600 acre-feet;

From the main stem of the Republican River upstream from the lowest crossing of the river at the Nebraska-Kansas state line and from water supplies of upstream basins otherwise unallocated herein, 138,000 acre-feet; provided, that Kansas shall have the right to divert all or any portion thereof at or near Guide Rock, Nebraska; and

In addition there is hereby allocated for beneficial consumptive use in Kansas, annually, the entire water supply originating in the Basin downstream from the lowest crossing of the river at the Nebraska-Kansas state line.

There is hereby allocated for beneficial consumptive use in Nebraska, annually, a total of two hundred thirty-four thousand, five hundred (234,500) acre-feet of water. This total is to be derived from the sources and in the amounts hereinafter specified and is subject to such quantities being physically available from those sources:

North Fork of the Republican River drainage basin in Colorado, 11,000 acre-feet;

Frenchman Creek (River) drainage basin in Nebraska,
52,800 acre-feet;

Rock Creek drainage basin, 4,400 acre-feet;

Arikaree River drainage basin, 3,300 acre-feet;

Buffalo Creek drainage basin, 2,600 acre-feet;

South Fork of the Republican River drainage basin, 800
acre-feet;

Driftwood Creek drainage basin, 1,200 acre-feet;

Red Willow Creek drainage basin in Nebraska, 4,200
acre-feet;

Medicine Creek drainage basin, 4,600 acre-feet;

Beaver Creek drainage basin, 6,700 acre-feet;

Sappa Creek drainage basin, 8,800 acre-feet;

Prairie Dog Creek drainage basin, 2,100 acre-feet;

From the North Fork of the Republican River in Nebraska, the main stem of the Republican River between the junction of the North Fork and Arikaree River and the lowest crossing of the river at the Nebraska-Kansas state line, from the small tributaries thereof, and from water supplies of upstream basins otherwise unallocated herein, 132,000 acre-feet.

The use of the waters hereinabove allocated shall be subject to the laws of the State, for use in which the allocations are made.

ARTICLE V

The judgment and all provisions thereof in the case of Adelbert A. Weiland, as State Engineer of Colorado, et al. v. The Pioneer Irrigation Company, decided June 5, 1922, and reported in 259 U.S. 498, affecting the Pioneer Irrigation ditch or canal, are hereby recognized as binding upon the States; and Colorado, through its duly authorized officials, shall have the perpetual and exclusive right to control and regulate diversions of water at all times by said canal in conformity with said judgment.

The water heretofore adjudicated to said Pioneer Canal by the District Court of Colorado, in the amount of fifty (50) cubic feet per second of time is included in and is a part of the total amounts of water hereinbefore allocated for beneficial consumptive use in Colorado and Nebraska.

ARTICLE VI

The right of any person, entity, or lower State to construct, or participate in the future construction and use of any storage reservoir or diversion works in an upper State for the purpose of regulating water herein allocated for beneficial consumptive use in such lower State, shall never be denied by an upper State; provided, that such right is subject to the rights of the upper State.

ARTICLE VII

Any person, entity, or lower State shall have the right to acquire necessary property rights in an upper State by purchase, or through the exercise of the power of eminent domain, for the construction, operation and maintenance of storage reservoirs, and of appurtenant works, canals and conduits, required for the enjoyment of the privileges granted by Article VI; provided, however, that the grantees of such rights shall pay to the political subdivisions of the State in which such works are located, each and every year during which such rights are enjoyed for such purposes, a sum of money equivalent to the average annual amount of taxes assessed against the lands and improvements during the ten years preceding the use of such lands, in reimbursement for the loss of taxes to said political subdivisions of the State.

ARTICLE VIII

Should any facility be constructed in an upper State under the provisions of Article VI, such construction and the operation of such facility shall be subject to the laws of such upper State.

Any repairs to or replacements of such facility shall also be made in accordance with the laws of such upper State.

ARTICLE IX

It shall be the duty of the three States to administer this compact through the official in each State who is now or may hereafter be charged with the duty of administering the public water supplies, and to collect and correlate through such officials the data necessary for the proper administration of the provisions of this compact. Such officials may, by unanimous action, adopt rules and regulations consistent with the provisions of this compact.

The United States Geological Survey, or whatever federal agency may succeed to the functions and duties of that agency, in so far as this compact is concerned, shall collaborate with the officials of the States charged with the administration

of this compact in the execution of the duty of such officials in the collection, correlation, and publication of water facts necessary for the proper administration of this compact.

ARTICLE X

Nothing in this compact shall be deemed:

- (a) To impair or affect any rights, powers or jurisdiction of the United States, or those acting by or under its authority, in, over, and to the waters of the Basin; nor to impair or affect the capacity of the United States, or those acting by or under its authority, to acquire rights in and to the use of waters of the Basin;
- (b) To subject any property of the United States, its agencies or instrumentalities, to taxation by any State, or subdivision thereof, nor to create an obligation on the part of the United States, its agencies or instrumentalities, by reason of the acquisition, construction, or operation of any property or works of whatsoever kind, to make any payments to any State or political subdivision thereof, state agency, municipality, or entity whatsoever in reimbursement for the loss of taxes;
- (c) To subject any property of the United States, its agencies or instrumentalities, to the laws of any State to any extent other than the extent these laws would apply without regard to this compact.

ARTICLE XI

This compact shall become operative when ratified by the Legislature of each of the States, and when consented to by the Congress of the United States by legislation providing, among other things, that:

- (a) Any beneficial consumptive uses by the United States, or those acting by or under its authority, within a State, of the waters allocated by this compact, shall be made within the allocations hereinabove made for use in that State and shall be taken into account in determining the extent of use within that State.
- (b) The United States, or those acting by or under its authority, in the exercise of rights or powers arising from whatever jurisdiction the United States has in, over, and to the waters of the Basin shall recognize, to the extent consistent with the best utilization of the waters for multiple purposes, that beneficial consumptive use of the waters within the Basin is of paramount importance to the development of the Basin; and no exercise of such power or right thereby that would interfere with the full beneficial consumptive use of the waters within the Basin shall be made except upon a determination, giving due consideration to the objectives of this compact and after consultation with all interested federal agencies and the state officials charged with the administration of this compact, that such exercise is in the interest of the best utilization of such waters for multiple purposes.
- (c) The United States, or those acting by or under its authority, will recognize any established use, for domestic and irrigation purposes, of the waters allocated by this compact which may be impaired by the exercise of federal jurisdiction in, over, and to such waters; provided, that such use is being exercised beneficially, is valid under the laws of the appropriate State and in conformity with this compact at the time of the impairment thereof, and was validly initiated under state law prior to the initiation or

authorization of the federal program or project which causes such impairment.

IN WITNESS WHEREOF, the Commissioners have signed this compact in quadruplicate original, one of which shall be deposited in the archives of the Department of State of the United States of America and shall be deemed the authoritative original, and of which a duly certified copy shall be forwarded to the Governor of each of the States.

Done in the City of Lincoln, in the State of Nebraska, on the 31st day of December, in the year of our Lord, one thousand nine hundred forty-two.

M. C. Hinderlider
Commissioner for Colorado
George S. Knapp
Commissioner for Kansas
Wardner G. Scott
Commissioner for Nebraska

I have participated in the negotiations leading to this proposed compact and propose to report to the Congress of the United States favorably thereon.

Glenn L. Parker
Representative of the United States.

Sec. 2. That Chapter 92, Session Laws of Nebraska, 1941, is repealed.

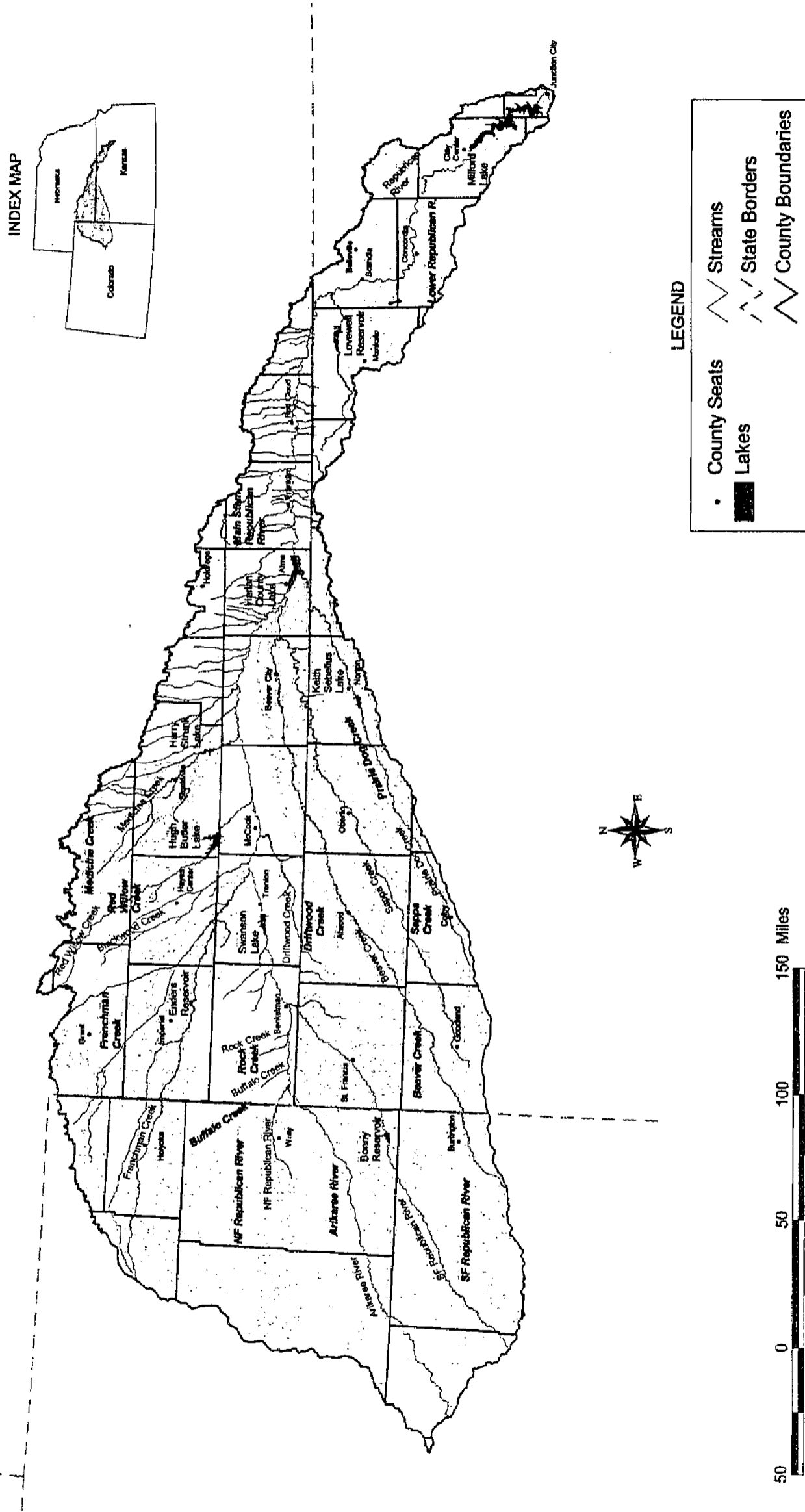
Sec. 3. Since an emergency exists, this act shall be in full force and take effect, from and after its passage and approval, according to law.

Insert Map from Session Laws 1943 for Compact (G) Republican River Compact
(Shoot from Book - 1943 Session Laws -- page 387)

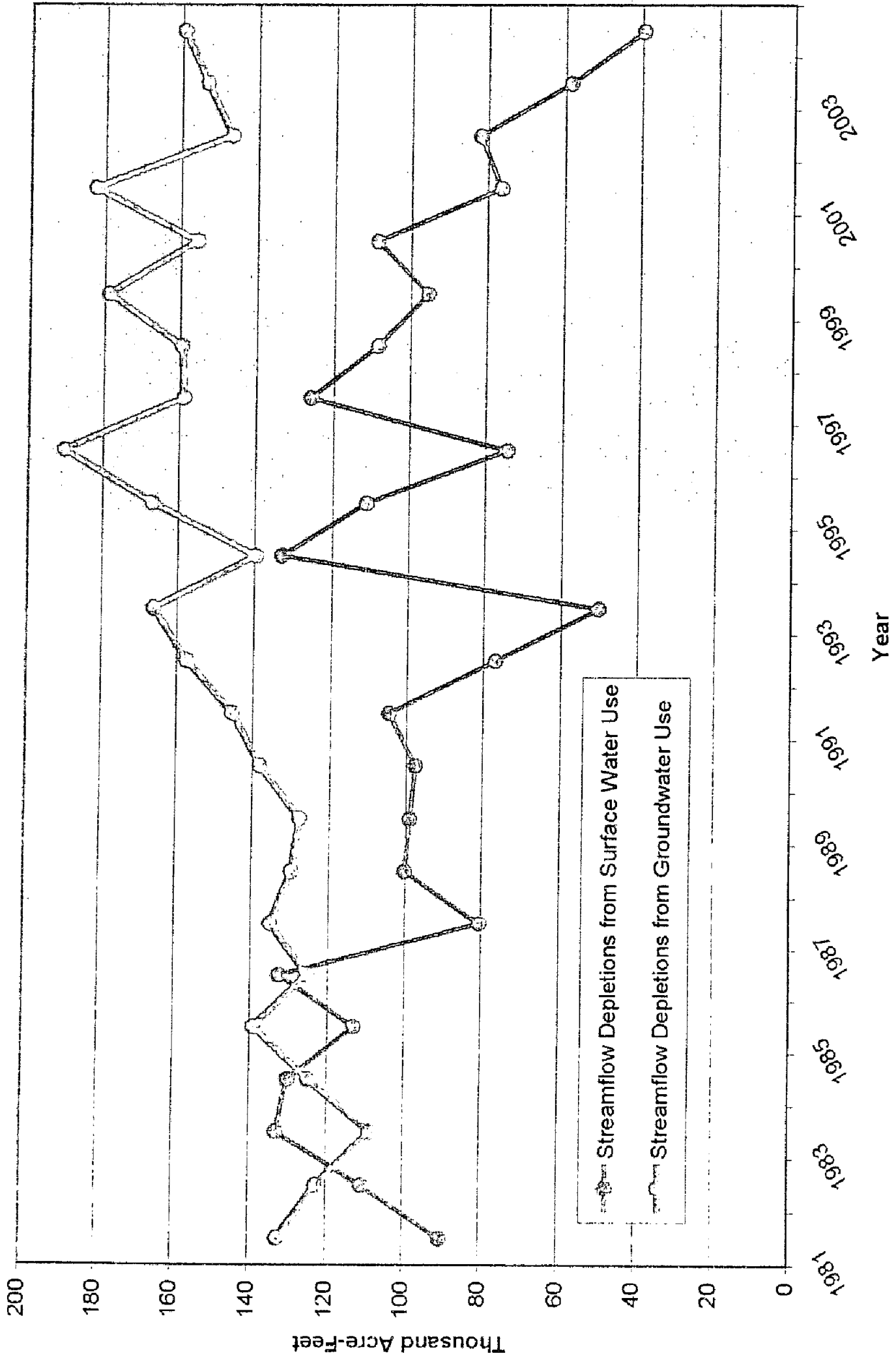
Source:

Laws 1943, c. 109, p. 377.

Update of Figure 3 - Map Showing Sub-basins, Streams, and the Basin Boundaries
 RRCA Accounting Procedures and Reporting Requirements
 January 12, 2005

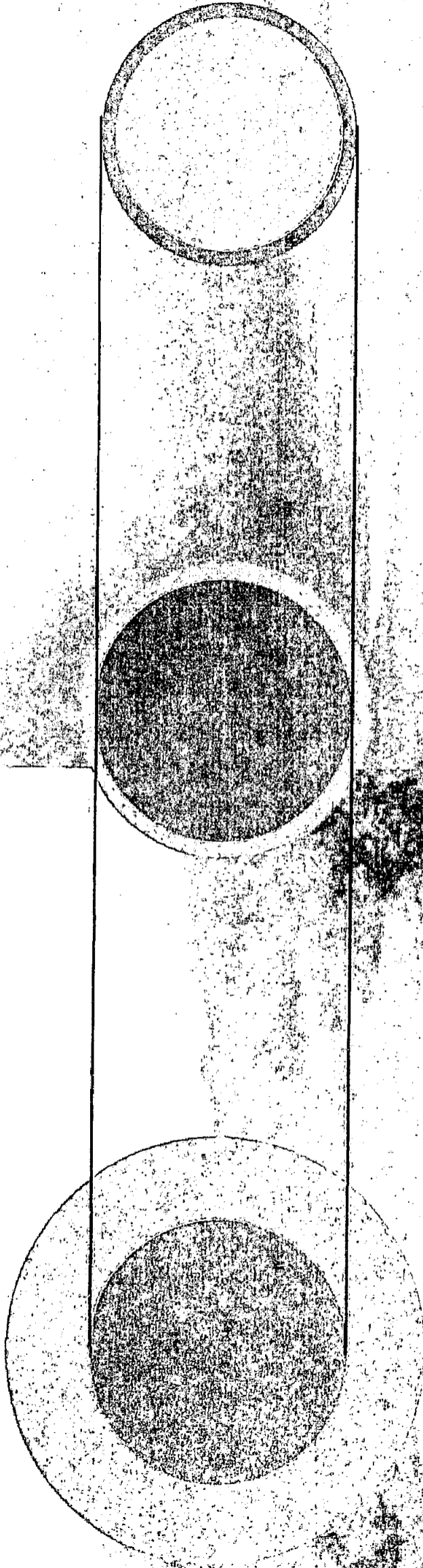


Nebraska Republican Basin Stream Depletions, 1981-2004



Nebraska's 49% Share

Grows and Shrinks with the Water Supply



Wet Year

Allocation: 400 K AF

C.U.: 267K AF

Average Year

Allocation: 268K AF

C.U. 258K AF

Dry Year

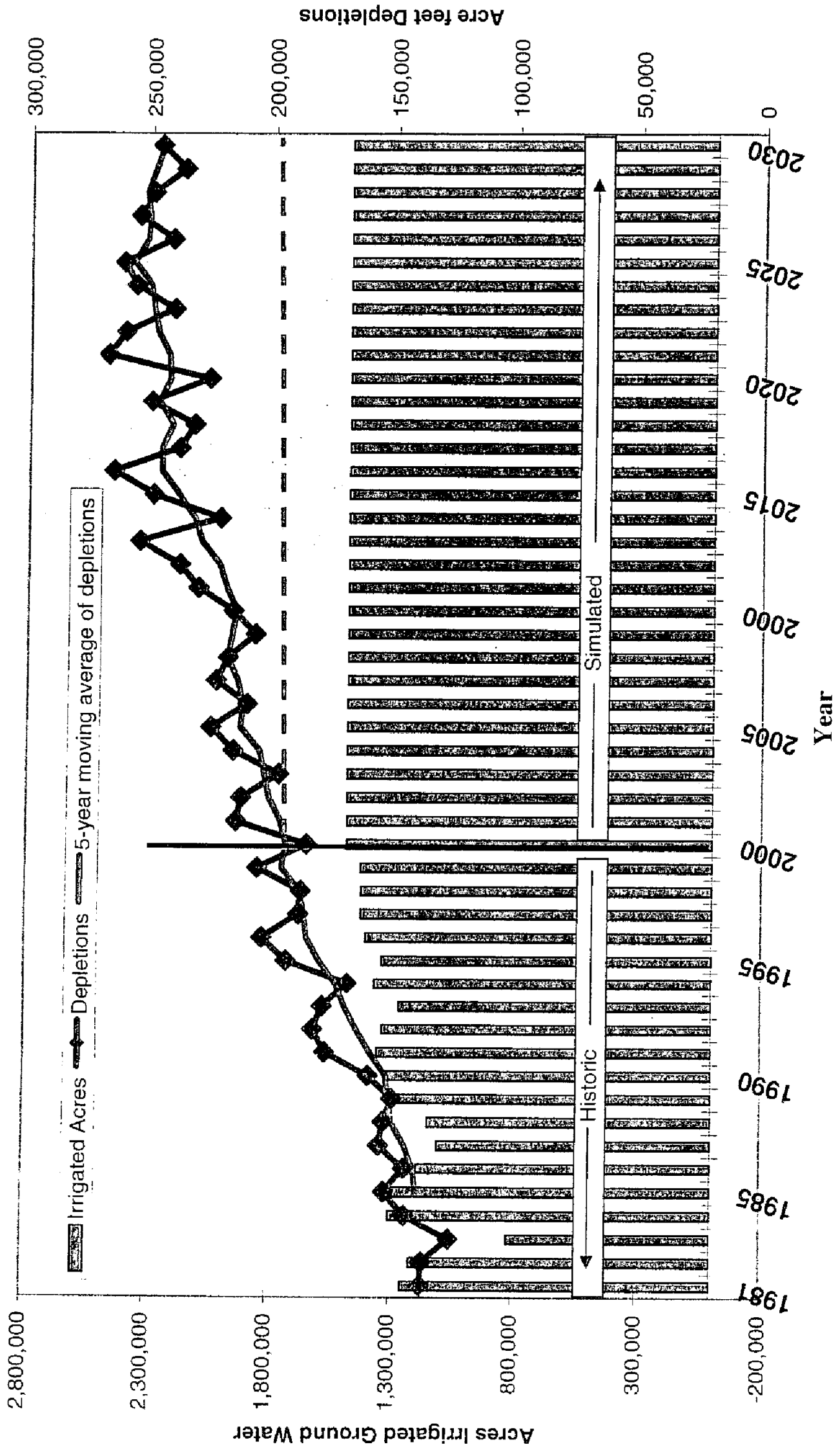
Allocation :211K AF

C.U. 263K AF

Nebraska's Adjusted Allocation

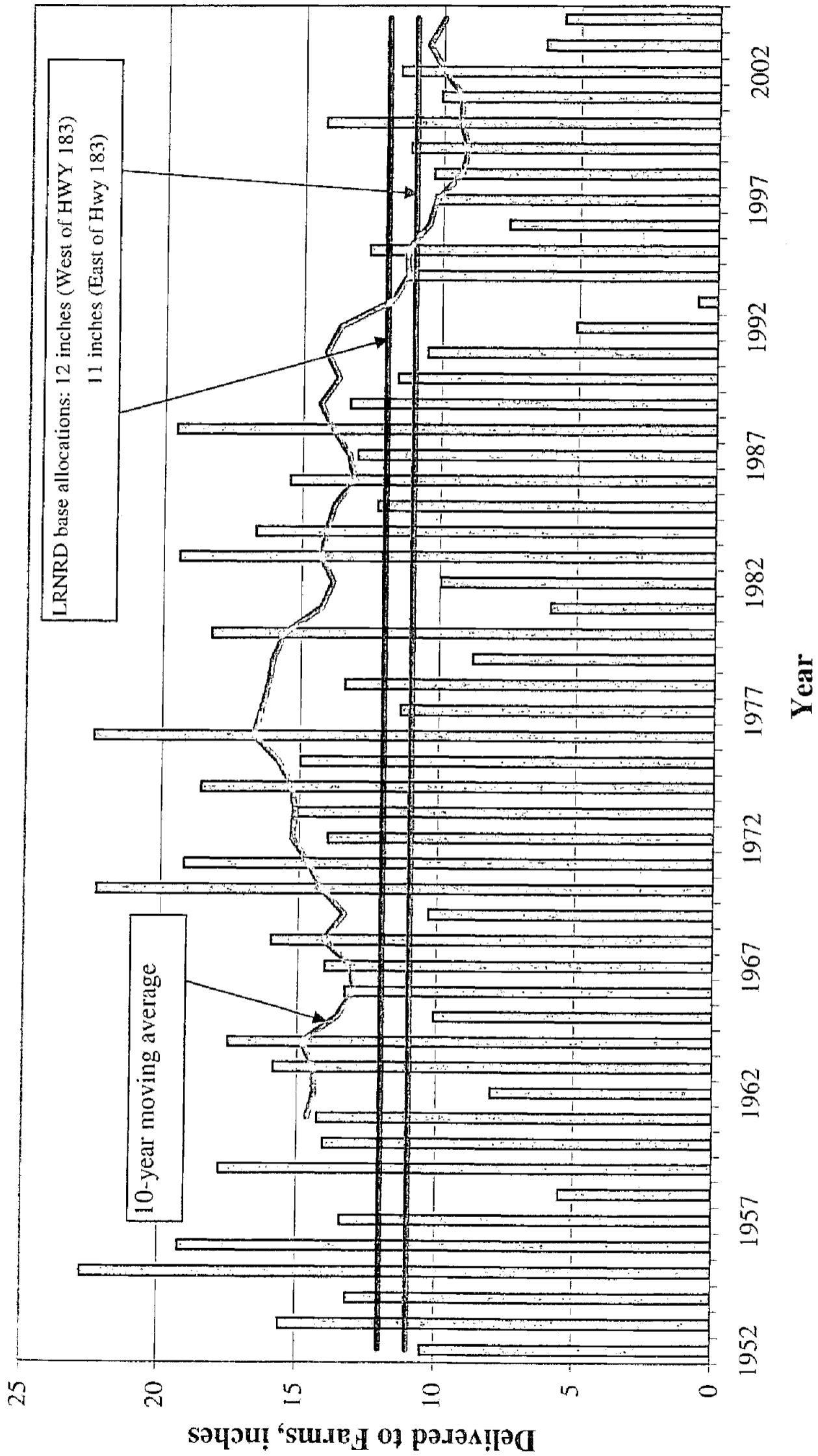
Nebraska's Consumptive Use

Lagged Depletions to Steam Flow in the Nebraska Portion of the Republican River Basin



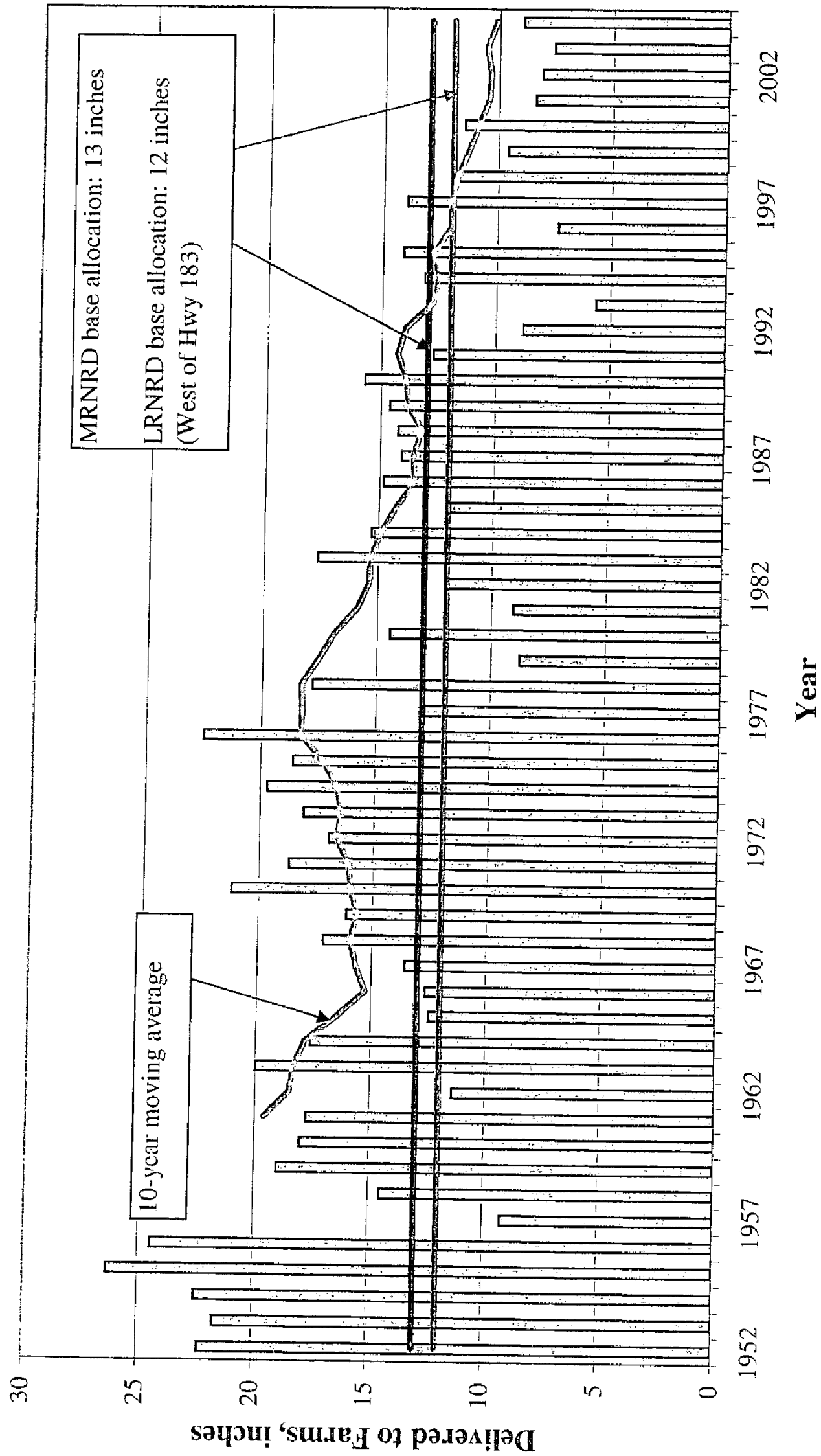
Simulated portion of graph was created from RRCA GW model run using 2000 level of well development and repeating the 1981-2000 climatic conditions.

Inches Delivered to Farms from SW Projects (Bostwick Irrigation District in Nebraska)



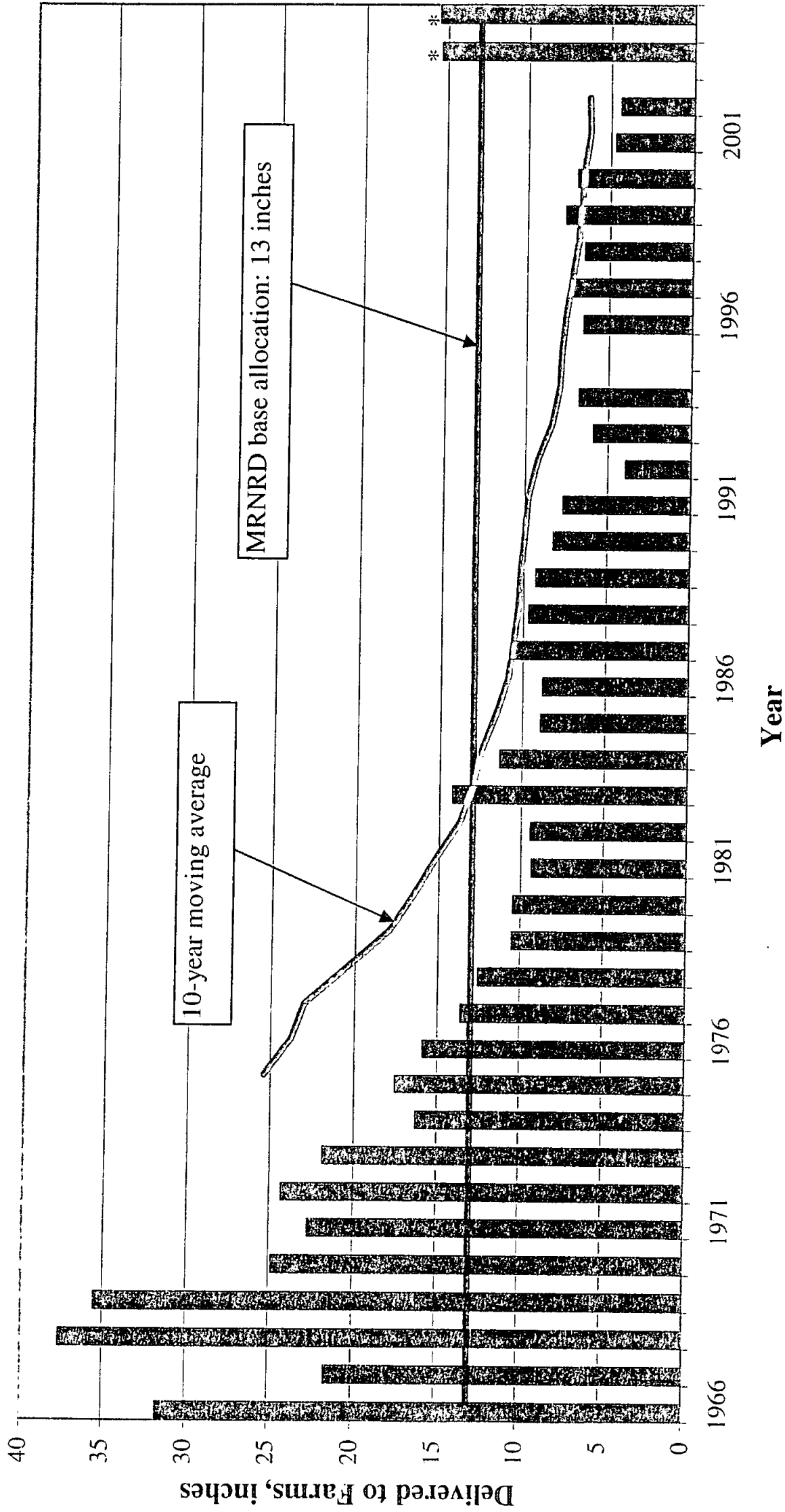
Data Source: USBR

Inches Delivered to Farms from SW Projects (Frenchman-Cambridge Irrigation District in Nebraska)



Data Source: USBR

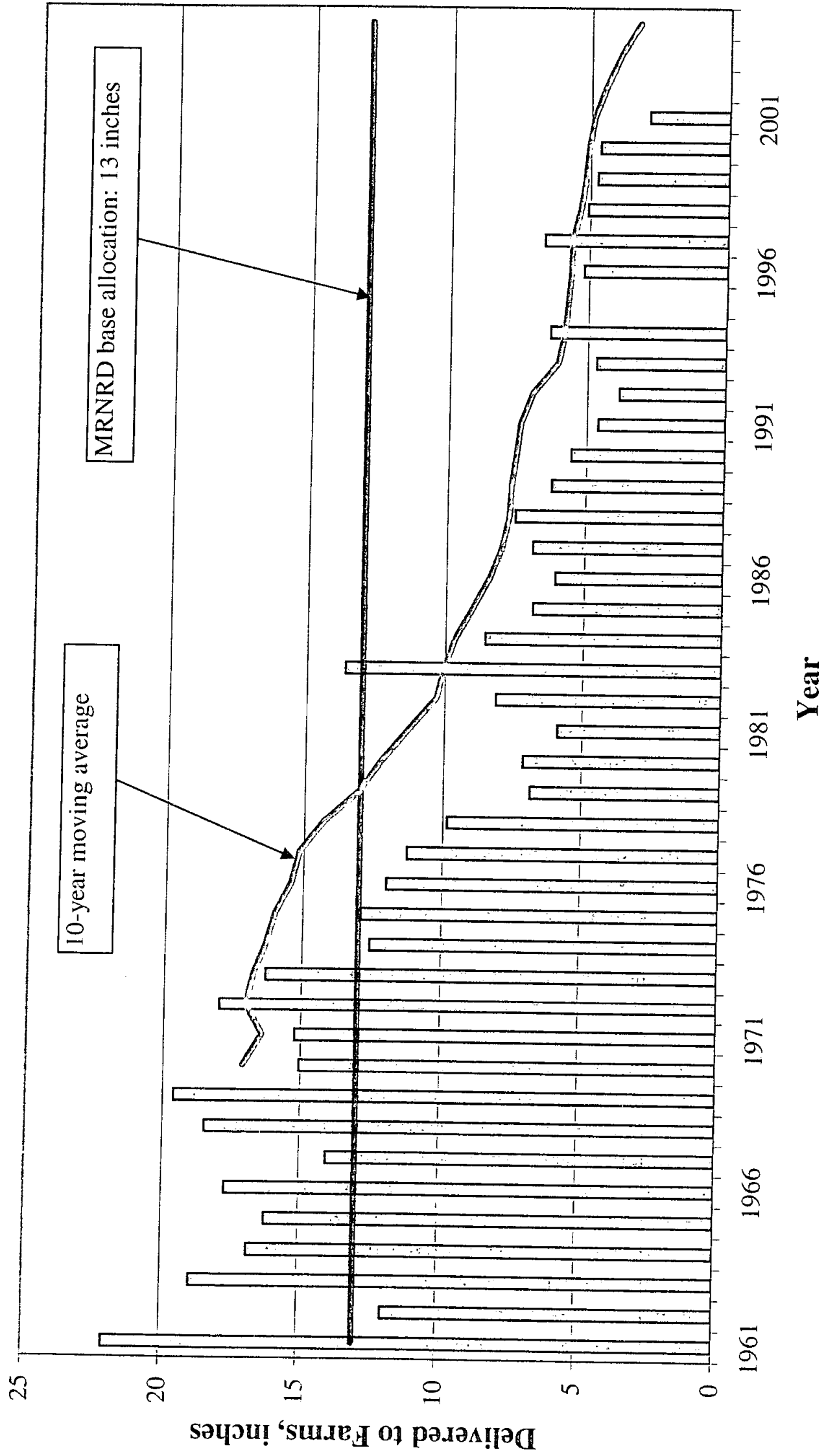
Inches Delivered to Farms from SW Projects (Frenchman-Valley Irrigation District in Nebraska)



* 2003 and 2004 only delivered water to 29% and 22% of service area respectively.

Data Source: USBR

Inches Delivered to Farms from SW Projects (H & RW Irrigation District in Nebraska)



Data Source: USBR

TRI-BASIN TOPICS

Spring 2005

Volume 19, Issue 2

"Dedicated to the Conservation of our Natural Resources"

State and NRD Restrict Irrigated Land Development

Landowners are prohibited from developing additional irrigated land in some portions of Tri-Basin Natural Resources District. Additional irrigated land development is restricted in the Republican River Basin in Gosper, Phelps and Kearney counties and that portion of the Platte Basin west of US highway 183 (Gosper and north-west Phelps counties).

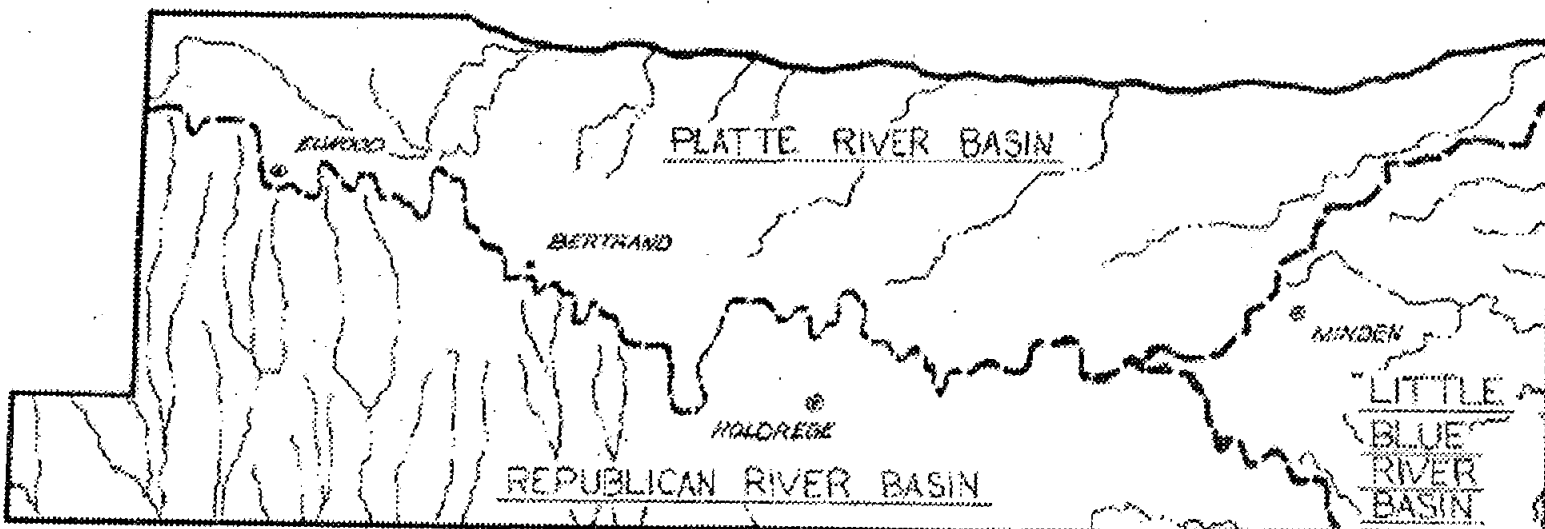
Tri-Basin NRD had to restrict development in the Republican Basin because the Republican River Compact, an agreement between Nebraska, Kansas, Colorado and the federal government, limits the amount of water Nebraskans can consume in that river basin. Data collected by the State of Nebraska indicates that the current amount of irrigated land in that basin is about equal to Nebraska's consumption limit. Additional irrigated land can't be developed, because that could result in Nebraska violating the compact agreement.

Last September, Nebraska Department of Natural Resources (DNR) Director Roger Patterson declared the Platte Basin west of Highway 183 "overappropriated" (more water water is being used than the river system can sustainably supply). As in the Re-

publican Basin, no additional irrigated cropland can be developed, because it would worsen the problem of over use of water resources. DNR Director Patterson has indicated that he will declare the Platte Basin east of Highway 183 (northeastern Phelps and Kearney counties) as fully appropriated in January, 2006. After that declaration is made, no additional irrigated land can be developed in that part of the district.

Tri-Basin NRD is in the process of certifying (counting) irrigated land in Gosper, Phelps and Kearney Counties. Certification entitles a landowner to use groundwater to irrigate existing cropland, hayland and pasture, regardless whether the land was previously irrigated with a well or canal water. The NRD has completed certification in the Republican River basin portion of the district. The district is now finalizing certification of irrigated land in the overappropriated portion of the Platte River Basin (west of US Highway 183). Irrigated cropland in the Platte Basin east of Highway 183

Continued on page 3....



<http://www.tribasinprd.org>



Managers Message

By: John Thorburn

Phragmites on the March

The arrival of Sandhill Cranes is an annual indicator of spring in south-central Nebraska. Tourists come from all over the world to see these majestic birds as they roost on the Platte River and feed in neighboring crop fields.

Careful observers will note that this spring the cranes will have less elbow room when they wade the Platte. That's because an invasive plant is smothering islands and choking river channels from North Platte to Grand Island. This invasive plant is called *phragmites*, also known as common reed. *Phragmites* is a tall grass. A really, really tall grass. It typically grows 10 to 12 feet tall, but can get as high as 20 feet. It also grows very densely, crowding out native plants and covering open sandbars essential for cranes as roosting habitat.



Phragmites is native to Australia. The introduced *phragmites* is very similar to a native reed, but it can be distinguished from native plants by its rough straight stems and aggressive growth habit (native reed is not widespread in Nebraska outside the Sandhills). It spreads rapidly by both seed and rhizomes (runners), roots that spread along the ground surface and sprout new plants at regular intervals.

Phragmites was originally introduced as an ornamental grass. Often mistakenly referred to as "pampas grass", it is favored landscaping because it has frondy seed heads at the top of the tall stems. It is still widely featured in home and commercial landscaping which, in my opinion, is equivalent to using musk thistle or poison ivy to beautify your property.

Phragmites is spreading rapidly in the Platte

River. As it takes hold, it outcompetes native plants, destroys wildlife habitat and obstructs streamflows. *Phragmites* spreads so rapidly because it has no natural control in the Great Plains. Fire by itself is not an effective control method. The grass is not very palatable to cattle, although Central Nebraska Public Power and Irrigation District ("Central") has had some success getting goats to feed on it.

Some herbicides have proven effective at controlling *phragmites*, but it is difficult to effectively apply herbicides on this plant because of its tall, dense growth habit. Helicopters have proven effective as a delivery system for applying herbicides on these plants because they can spray with great precision and the downdraft from their rotors pushes the spray down into the interior of *phragmites* clumps. Unfortunately, using helicopters to spray weeds is very expensive. When Central used helicopters to spray *phragmites* on their Jeffrey Island property, they spent about \$200 per acre for the treatment. Treating the Platte river channel from Lexington to Grand Island using this method could cost as much as \$10 million per year.

This invasive plant presents new challenges that require new ideas and approaches to effective land and wildlife habitat management. County weed control superintendents are working together with UN-K researchers, environmental groups and state and federal agencies to develop a strategy to control *phragmites* and other invasive plants in the Platte River. I hope that this effort succeeds. If it doesn't, someday the Platte will be filled with "ornamental grass", but sandbars and cranes will be just a memory.



....Irrigated Land continued from page 1

(eastern Phelps and Kearney counties) will be certified in 2006.

Property tax records are the primary source of information that Tri-Basin NRD uses to determine the number of certifiable irrigated acres. Land must be taxed as irrigated cropland or irrigated grassland to be certified by the NRD. Landowners in northeast Phelps and Kearney counties need to check with their county assessor to make sure that their irrigated acreage assessments are correct **before** the certification process starts in their area, so the NRD can certify the appropriate number of certified irrigated acres on their property.



Todd Garrelts

Todd Garrelts and his wife, Nancy live on the outskirts of Holdrege with their daughter, Paige, and their son, Blake. Todd represents subdistrict 4 and serves as treasurer for the Tri-Basin Board of Directors. After graduating from Elm Creek High School, Todd attended the University of Nebraska at Lincoln. He currently attends Bethel Lutheran Church, and is a member of Phelps-Gosper Livestock Feeders Association, Nebraska Cattlemen, and Nebraska Corn Growers. In his free time Todd enjoys spending time at the lake and taking flying lessons.

After the NRD has closed an area to new development, the only way landowners can develop uncertified land (land without a previous irrigation history) for irrigation is by ceasing irrigation on existing irrigated land and transferring existing certified acres to a new location. One certified acre must be transferred for each new acre to be developed. Landowners must apply to the NRD to transfer irrigated land.

Transfers of certified irrigated land need to be approved by the NRD Board of Directors and affected county assessors before they can proceed. If you have questions about certifying irrigated land, you can get more information by contacting the Tri-Basin NRD office toll-free at (877)995-6688, or you can read our rules and regulations on-line at www.tribasinprd.org.

Landowners in Tri-Basin NRD With Irrigated Land in the Republican River Basin

- * **Flowmeters must be installed on all irrigation wells in the Republican River Basin in Gosper, Phelps and Kearney Counties by December 31, 2005.**
- * **If you have an approved Republican Basin Flowmeter Cost-Share Agreement – Your flowmeters must be installed no later than September 30, 2005 to qualify for 50% cost-share. If eligible, your cost-share application can be extended to September 30, 2005.**

**Call Tri-Basin NRD Toll Free (1-877-995-6688)
for questions.**

**Note: You must receive cost-share approval
before purchasing/installing flowmeters**

Check out these web sites:

<http://www.agwaterbudget.com>

<http://www.nws.noaa.gov>

<http://dnrdata.dnr.state.ne.us/NeRAIN>

http://www.dnr.state.ne.us/dnrnews/news2004/summer2004_sm.pdf

<http://waterdata.usgs.gov/nwis/>

http://net.unl.edu/swi/pers/water_worries.html

-Water Allocation to Economic Recovery

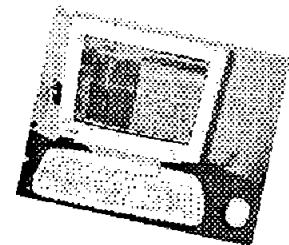
-National Weather Service

-NE Rain and Hail Study

-LB 962

-Water Data for the Nation

-Nebraska Reservoirs



CALENDAR OF EVENTS

(All meetings are at NRD office in Phelps County Ag Center unless otherwise noted.)

May

- May 10 - NRD Board Meeting at 7:30 p.m.*
- May 30 - Memorial Day (office closed)

June

- June 8-9 -Republican River Compact Admin. Meeting in Wray, CO
- June 14 - NRD Board Meeting at 1:30 p.m.*

July

- July 4 - Independence Day (office closed)
- July 7 -NE Natural Resources Commission Meeting 8:30 a.m.*, Super 8 Motel, Holdrege
- July 12 - NRD Board Meeting at 1:30 p.m.*
- July 16-21 -Kearney County Fair
- July 23-28 -Phelps County Fair

* Times are tentative

NOTICE

- Landowners and operators who wish to renew chemigation permits must submit renewal permit applications by May 31, 2005!

TRI-BASIN TOPICS is a publication of the Tri-Basin Natural Resources District, 1308 Second Street, Holdrege, NE 68949 (308) 995-6688 Toll Free 877-995-6688 E-mail trbbasin@trbbasinmrd.org

TRI-BASIN NRD STAFF

John Thorburn..... General Manager
 Richard Holloway.....Assistant Manager
 Charles Brooks..... Land Resources Coordinator
 Carie Lynch..... Administrative Secretary
 Roger David..... Conservation Technician
 Steve Nelson.....Land Resource Technician
 Tammy Fahrenbruch.....Office Manager
 Esther Smith.....Office Clerk
 Shannon Helms.....Inf. & Education Assistant
 Nicole Salisbury.....Office Assistant
 Marlene Shearer.....Minden Office Secretary
 Mary Stauffer.....Elwood Office Secretary
 Patty Abrahamson.....Holdrege Office Secretary

A mailing list is maintained and requests to be placed on the list should be sent to the above address. Comments and suggestions may be addressed to the General Manager.

TRI-BASIN NRD BOARD OF DIRECTORS

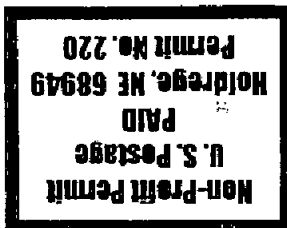
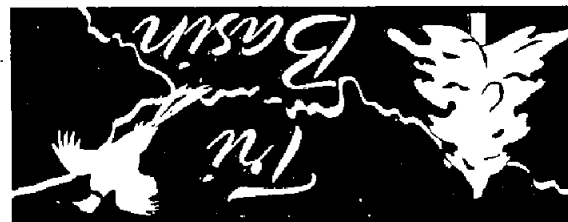
Brad Lundeen, Chairman Wilcox, NE	Gary Lindstrom Wilcox, NE
Phyllis Johnson, Vice Chairman Bertrand, NE	Ed Harris Loomis, NE
Todd Garrelts, Treasurer Holdrege, NE	David Nickel Kearney, NE
David Olson, Secretary Minden, NE	David Raffety Kearney, NE
David Nelson Upland, NE	Larry Reynolds Lexington, NE
Harold D. Erickson Holdrege, NE	Ray Winz Holdrege, NE
Dick Helms Arapahoe, NE	

—IN THIS ISSUE—
 *Republican Basin Flowmeter Information
 *Irrigated Land Development
 *Phragmites Update

RETURN SERVICE REQUESTED

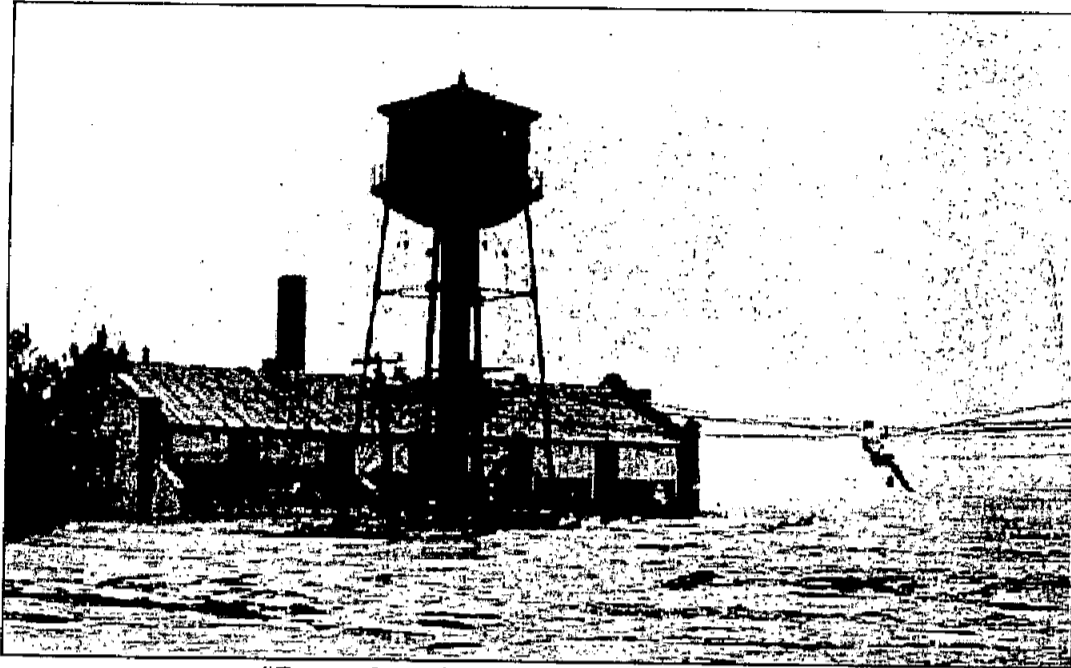
1308 Second Street
 Holdrege, NE 68949

Natural Resources District



Republican Flood of 1935

Nebraska's Deadliest Flood



"Escape from the McCook Electric Company"

The Republican was so high, it forced these men to use the high wires to get to safety.
(Note: more people on building roof at left)

Background

You wouldn't know it from today's appearance, but the Republican River used to have an untamed reputation. A flood similar to the magnitude of the 1935 event was said to have also occurred in 1826. In addition, floods of magnitude which threatened life and property were reported in 1885, 1903, 1905, 1915, and 1947. On May 26, 1885, 9 people were killed from the towns of Cambridge, Richmond Canyon, and Arapahoe; victims are buried in Cambridge with a monument. On June 23, 1947, 13 were killed in Cambridge and Orleans. Total damage was estimated at \$15 million, largely because 7.5 inches of rain fell in the Medicine Creek watershed. When this flow mixed with the already-swollen Republican flow, it caused it to rise to a record stage in Orleans: 23 feet, 14 feet over flood stage.

Pre-flood Conditions

Like many other places in the West during the Great Depression, the spring of 1935 was extremely dry. Severe and intense dust storms routinely swept across the flat landscape of southwestern Nebraska, completely blocking out sunlight. If one was unfortunate enough to be caught out on the road during a storm, it was not uncommon to drive into the roadside ditch due to the poor visibility. When this happened, cars were known to overturn and be completely covered in wind-blown sediment. Often, these unfortunate folks were not found for years.

But this all changed in May when the skies finally started to open up and allowed some rain to fall on the parched landscape. A few days later and after continued rain, farmers were excited that they could be in for a bumper crop for the first time in many years. But they were not aware of the major storm brewing in Colorado which would literally drown those dreams.

The Flood

The storm of May 31/June 1 was unique for two reasons: first, it dumped an incredible amount of rain - where the Arickaree and Republican rivers meet in Colorado, 20 inches of rain was recorded, and 24 inches in 24 hours was recorded along the South Fork Republican River. The entire upper Republican watershed witnessed an average rainfall of nine inches. This storm was also unique in that it moved in the same direction as the drainage basin. As a result, the Frenchman, Red Willow, Medicine, Deer, Muddy, and Turkey creeks all reached their flood peaks at the same time as the crest passed on the Republican River.

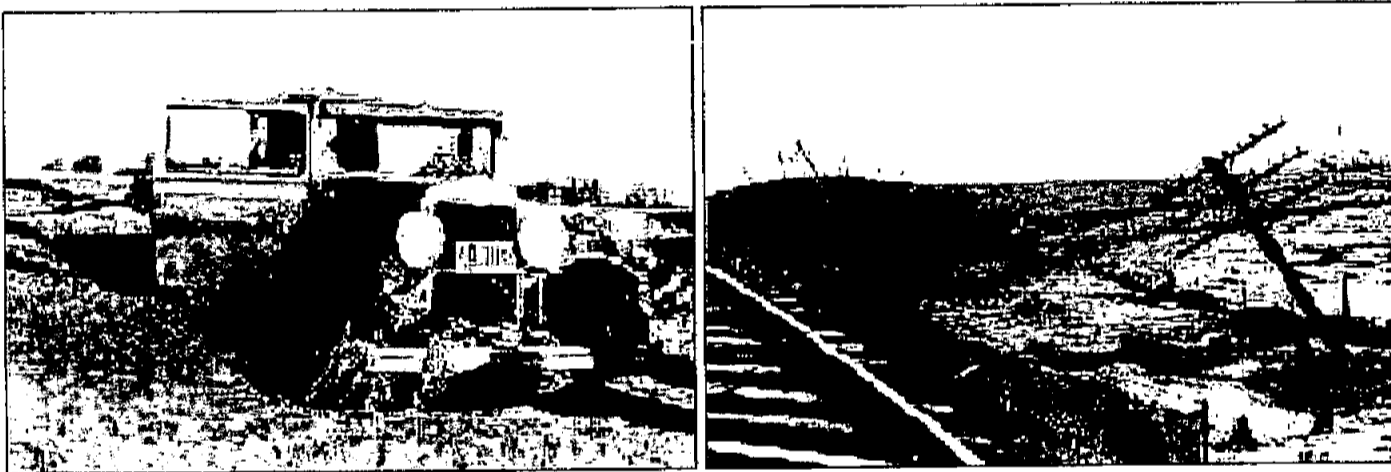
According to witness accounts, the roar of the water could be heard coming down the Republican Valley five miles away. Many survivors also reported that there were two crests - the water came up on May 28, then receded slightly, but the second crest on June 1 greatly exceeded the first. At one point, the water rose six feet in thirty minutes and was ten to fifteen feet higher than the previous record crest. Another account states that the Republican rose 10 feet in 12 minutes in McCook;

naturally, anything in the path of that wall of water would be destroyed. Water was twenty feet deep in some places, and the discharge was an incredible 280,000 cubic feet/second - more than 320 times the normal flow today. Water was "bluff-to-bluff" in areas where the bluffs are typically at least two miles apart. The town of Haigler was spared because it is situated on higher ground, but places like Parks, Benkleman, Max, Stratton, Trenton, Culbertson, and McCook were severely impacted if not outright destroyed. In addition to these towns, deaths also took place in Perry, Arapahoe, Orleans, Oxford, Franklin, Alma, and Cambridge. Some victims were last seen screaming for assistance from the roof of their home as it was being swept down the river.

Due to the fact that deaths occurred in three states and that reporting back in 1935 was not very efficient, the number of deaths attributed to flooding differs. An accurate estimate would be 113 killed - most reports just say "over one-hundred" dead. A reported 11,400 head of cattle and 41,500 were killed by the high water, and one report stated that carcasses littered roads as to make them impassable. In total, 341 miles of highway and 307 bridges were destroyed, and 74,500 acres of farmland were inundated. The damage estimate of \$26 million is almost certainly low - personal losses, bridges, agricultural, and railroad losses were all incredibly heavy. \$26 million is equivalent to nearly \$800 million in 1997 dollars.

The River Today

The Republican River has a total drainage area of 22,400 square miles and has its headwaters in northeastern Colorado. There have been several dams constructed in the Republican basin, most in response to the 1935 flood. Harlan County Dam is the second-largest reservoir in Nebraska and was completed in 1952. In addition to the addition of reservoirs, flow rates have also decreased over time due to irrigation and other upstream uses. As a result, damaging floods have not occurred after 1960.



For further reading, these documents were used in the preparation of this report:

Hoffman, Rocky. River Portraits: The Republican. 1983. *Nebraska Rivers*, v. 61, #1 (January-February): 58-65.

Wilmot, Marlene Harvey. *Bluff-to-Bluff: The 1935 Republican Valley Flood*.
Wilmot, Marlene Harvey. *Bluff-to-Bluff, too! The 1935 Republican Valley Flood*.

(Marlene Wilmot's publications are available at the Nebraska State Historical Society on the campus of the University of Nebraska in Lincoln.)

STATE OF NEBRASKA

DAVE HEINEMAN
GOVERNOR

NEBRASKA ETHANOL BOARD

TODD C. SNELLER
ADMINISTRATOR



TO: Water Policy Task Force Attendees
FROM: Todd Sneller
RE: Nebraska Ethanol Plants and E85 Stations across Nebraska

E-10 Unleaded gasoline usage is increasing at a rapid rate in the Midwest. In April of 2005, Nebraska motorists purchased E-10 Unleaded at a record pace; almost seven out of every ten gallons of gas sold was E-10 Unleaded. The increase in sales was in large part due to the price of ethanol. E-10 Unleaded sold for as much as 10 cents less than unleaded gasoline.

With ethanol helping to soften the impact of record gasoline prices it's no surprise to see the increased interest in E85. E85 contains 85% ethanol and 15% gasoline and is blended for "flexible fuel" vehicles designed to run on the blend. Flexible fuel vehicles can also run on E10 or any combination of ethanol gasoline up to E85.

There are now 25* commercial E85 fueling sites across Nebraska with many more expected. Since January of this year, the number of Flexible Fuel Vehicles has increased from 20,000 to 39,000 according to state motor vehicle data. The number of vehicles that can run on E85 has almost doubled in Nebraska during the past six months. Sales of E85 are projected to set a new record in 2005.

*As of July 18, 2005

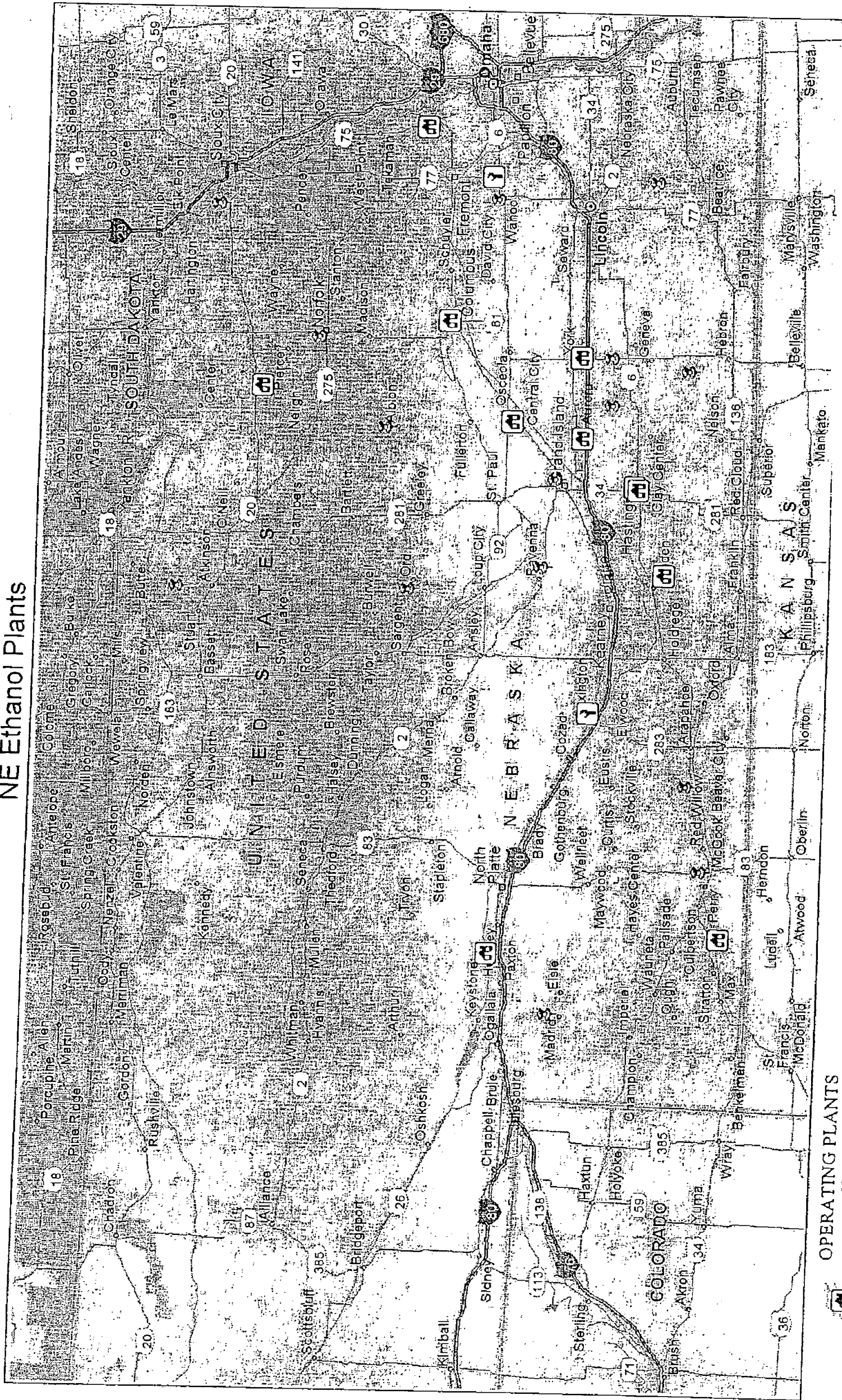
NEBRASKA STATE OFFICE BUILDING
301 CENTENNIAL MALL SOUTH, P.O. BOX 94922

RECEIVED
JUL 19 2005

107

DNR 017368

NE Ethanol Plants



OPERATING PLANTS

- Hastings, Columbus, York, Blair, Aurora, Hastings, Plainview, Minden, Trenton, Sutherland, Central City

UNDER CONSTRUCTION

- Lexington, Mead

UNDER CONSIDERATION

- Carlton, Ord, Fairmont, Adams, Sutton, Albion, Atkinson, Jackson, Grand Island, Wahoo, Ravenna, Cambridge, Madrid, McCook, Norfolk

*As of July 18, 2005

Nebraska Ethanol Plants 2005

Chief Ethanol Fuels, Inc.

PO Box 488, Hastings, NE 68902

Phone: 402-463-6885; Fax: 402-462-9931

This was the first Nebraska plant to go on-line in January 1985 and has expanded three times since 1985. The Chief Ethanol plant is currently producing 65 million gallons of ethanol per year and has 50 employees. The annual grind 24.5 million bushels of corn. Chief Ethanol Fuels utilizes corn.

ADM Corn Processing

3000 East 8th Street, Columbus, NE 68601

Phone: 402-564-6353; Fax: 402-564-5035

This wet mill plant started production in November 1992 as Minnesota Corn Processors. MCP added sweetener facilities to that plant which meant an incremental increase in ethanol production. ADM purchased MCP in the fall of 2002. ADM produces 100 million gallons of ethanol per year and has created 275 full-time jobs. The annual grind is 80 million bushels. ADM utilizes corn.

Abengoa Bioenergy Corporation

1414 Road O, York, NE 68467

Phone: 402-362-2285; Fax 402-362-7041

High Plains Corporation initially developed this dry mill plant began producing ethanol in November 1994. The plant employs 60 full time employees and produces 50 million gallons of ethanol per year. Annual grain grind is 20 million bushels. Abengoa officials have started work on several process improvements since the plant was acquired. Abengoa utilizes corn at this plant.

Cargill, Inc.

PO Box 300, Blair, NE 68008

Phone: 402-533-4100; Fax 402-533-4103

This wet mill plant started production in April 1995. Currently, Cargill has the capacity to produce 85 million gallons of ethanol per year and has created 229 permanent jobs. Their annual corn grind is 72 million bushels. Cargill utilizes only high quality #2 yellow corn.

Nebraska Energy, LLC

1205 S "O" Road, Aurora, NE 68818

Phone: 402-694-3635; Fax 402-694-4545

This dry milling plant started production in October 1995. Nebraska Energy annually produces 35 million gallons of ethanol. The plant employs 40 full-time employees and has an annual grain grind of 14 million bushels. Nebraska Energy utilizes corn. Currently, Nebraska Energy is undergoing an expansion of ethanol production capacity and will be producing 50 million gallons of ethanol per year.

Ag Processing, Inc. (AGP)

PO Box 49, Hastings, NE 68902

Phone: 402-463-5920; Fax 402-463-7351

Omaha Phone: 402-498-5546; Fax 402-498-2247

This dry mill plant came on-line in November 1995.

Currently, AGP has the capacity to produce 48 million gallons of ethanol per year and has 45 full-time employees. The annual grain grind is 18 million bushels. AGP utilizes corn.

Husker Ag, LLC

54048 Hwy 30, Plainview, NE 68769

Phone: 402-582-4446; Fax 402-582-3888

Husker Ag began production in March 2003. The plant utilizes corn and produces 20 million gallons of ethanol per year. Husker Ag has created 31 full-time jobs. The annual grind is approximately 8.3 million bushels.

KAAPA Ethanol, LLC

PO Box 238, 8450 KAAPA Lane

Minden, NE 68959 (plant site is near Axtell)

Phone: 308-743-2217; Fax: 308-743-2274

KAAPA Ethanol began production in November 2003. The plant was designed to produce 40 million gallons of ethanol each year. KAAPA employs 34 people. The annual grind is 15 million bushels of corn. KAAPA is currently undergoing expansion and will be producing 50 million gallons of ethanol each year and will employ an addition 20 people.

Trenton Agri Products

HC Box 147, Trenton, NE 68044

Phone: 308-334-5100; Fax: 308-334-5101

Trenton Agri products began production in April 2004. The plant is designed to produce 30 million gallons of ethanol. Trenton Agri products employs 34 people. The plant utilizes corn and milo.

Midwest Renewable Energy

27532 W Hwy 30, Sutherland, NE 69165

Phone: 308-386-2468; Fax: 308-386-2496

This dry mill began production in May 2004. The plant employs 30 full time employees and is designed to produce 15 million gallons of ethanol each year. Annual grind is 6 million bushels of corn.

Platte Valley Fuel Ethanol, LLC.

214 20th Street, Central City, NE 68826

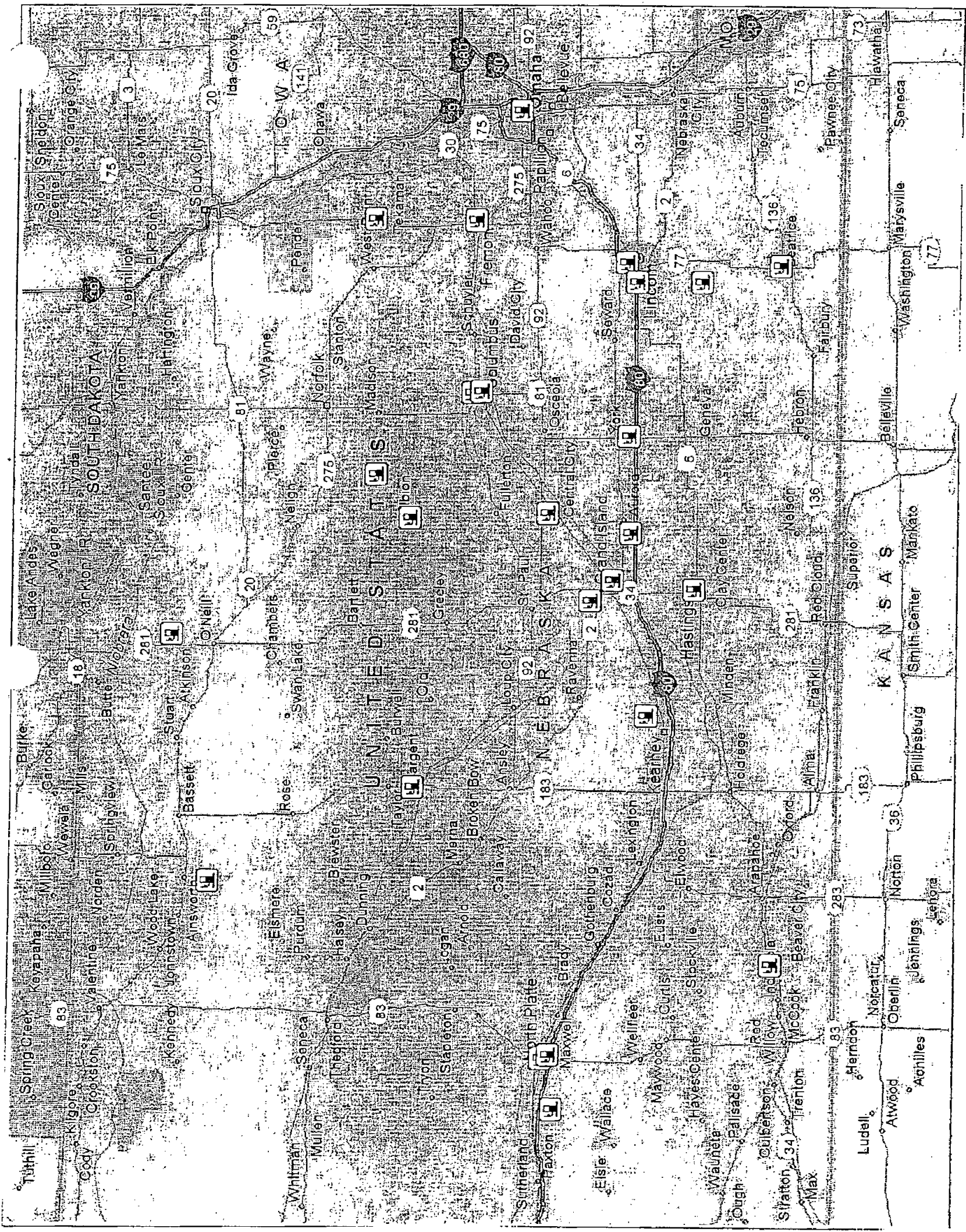
Phone: 308-946-2600; Fax 308-946-2609

This dry mill plant started production in May 2004. PVFE employs 35 full time employees and has the capacity to produce 45 million gallons of ethanol per year. Annual corn grind is 16 million bushels. PVFE is expanding corn grind to 30 million bushels to process 100 million gallons of ethanol per year. Another 6-10 permanent jobs will be added.

Nebraska Ethanol Board

www.ne-ethanol.org

301 Centennial Mall South, PO Box 94922, Lincoln, NE 6809 Phone: 402-471-2941, Fax: 402-471-2470



*As of July 18, 2005

1

2

Cenex-Ampride C-Store
409 East 4th
Ainsworth, NE 69210

White Star Oil Company
305 North 6th Street
Albion, NE 68620

Aurora Cooperative
Service Center
1318 M Street
Aurora, NE 68818

Ag Valley
Highway 6 & 34
Bartley, NE 69020

Farmers Union Supply
Company
1615 North 6th Street
Beatrice, NE 68310

Country Pride Farm and
Home
719 16th Street
Central City, NE 68826
(308) 946-3384

Sapp Brothers Sinclair
4300 23rd Street
Columbus, NE 68601
(402) 564-8268

AJC Store
903 U.S. Highway 30
Duncan, NE 68634

Broad Street BP
2246 N Broad Street
Fremont, NE 68025

Aurora Cooperative
Fueling Center
1140 S Lincoln Ave
Grand Island, NE 68801

Pump & Pantry #3
3500 W. Capital Drive
Grand Island, NE 68803

Otte Oil and Propane
401 Main Street
Hallam, NE 68368

Pump & Pantry #24
1630 East South Street
Hastings, NE 68901

Patriot Motor Fuels,
LLC
I-80 and Hershey Road
Hershey, NE 69143

Pump & Pantry #27
4311 2nd Ave
Kearney, NE 68847

Phillips 66
110 West O Street
Lincoln, NE 68528

Gas 'N Shop
1545 Cornhusker
Highway
Lincoln, NE 68521

The Grove
301 South 8th Street
Newman Grove, NE
68758

Conoco
1401 South Jeffers
North Platte, NE 69101
(308) 532-5176

R & C Petroleum, Inc.
523 East 4th Street
North Platte, NE 69101

Ampride Travel Center
Central Valley Ag
204 East Highway 20
O'Neill, NE 68763

Cenex
107 West 2nd Street
Oakland NE 68045
(402) 685-5613

Cubby's Old Market
Grocery
601 S 13th St
Omaha, NE 68102

Drake Oil Company
300 North Highway
1183
Sargent, NE 68874

UFC
1504 Platte Avenue
York, NE 68467

Coming Soon**
Western Travel
Terminal Truck Stop
822 S. Beltline Highway
Scottsbluff, NE 69361

Water 'rights'

7/10/05 O.W.H.

The depth of the hole Nebraska has dug for itself can be discerned from two Department of Natural Resources statistics: Between 1993 and 2004, 11,682 new groundwater irrigation wells were drilled across the state. And between 1970 and today, the number of wells rose from 39,660 to nearly 100,000.

Two State Supreme Court decisions on groundwater regulation, the latest made public Friday, didn't really make the hole any deeper.

What the decisions did was make crystal clear who is responsible for getting the state out. Not the Department of Natural Resources, which the court twice ruled had no jurisdiction over groundwater. But rather the Legislature, which has slipped and shimmied and slithered around this politically charged land mine for decades.

The problem, simply, is how groundwater and surface water are seen by state law. Though in reality they are inextricably entwined, the law treats them as separate resources.

Even Legislative Bill 962, passed last year to begin addressing the situation, maintains the division: The DNR is responsible for surface water and the system of senior and junior irrigation rights. The state's 23 natural resources districts are responsible for groundwater.

The first ruling came in a suit filed against the DNR by the Central Nebraska Public Power and Irrigation District in Holdrege, Neb. District officials claimed that groundwater wells in the Platte River basin above Lake McConaughy were taking up to 100,000 acre-feet of water that rightfully belonged in the lake, which Central manages. The district argued that state law and the constitution gave the DNR authority to regulate groundwater as well as surface water for the good of all Nebraskans. The Supreme Court disagreed.

The court, in its written decision, said it found "no statutory authority or case law that supported applying surface-water appropriations to groundwater." The court also noted that while "most legislatures in western states had developed comprehensive appropriation sys-

**Will a senator
with courage
and expertise
please stand up
for Nebraska?**

tems . . . , in Nebraska, the Legislature has not" This situation leaves surface-water and groundwater users to battle conflicts out on their own.

But surface-water irrigators don't have the ammunition, as Central recognized in its lawsuit. The irrigators it serves via releases from Big Mac get water only when it is there. As upstream underground well irrigators suck water out of McConaughy, less water remains for Central's surface irrigators. The court's ruling, in effect, makes all irrigators with underground wells, even one dug yesterday, senior in water rights to all surface-water users, no matter how longstanding their water rights.

The high court's Friday ruling was against Spear T Ranch near Bridgeport, Neb., which had wanted the state to stop underground irrigators from drying up Pumpkin Creek, leaving the ranch no water. While a previous court decision said that Spear T could sue well owners, in this instance the court found, as it did in the Central case, that the DNR had no authority to regulate underground water wells. Suits are expensive and time-consuming. Hundreds, perhaps more, could be filed by Nebraska's surface irrigators against their neighbors.

Surface-water seniority means first in time, first in right. Is there no way to integrate groundwater rights into that system, so that however an irrigator gets his water, the irrigator with the oldest rights — well or surface — gets first call, and so on down the line?

Or perhaps there are better, but still practical, ideas out there. Certainly, ideas and action are needed, before irrigators begin flinging lawyers, or worse, at each other.

The finger pointed at the Legislature by the State Supreme Court is compelling. Most other states have long since managed to integrate their laws regarding groundwater and surface water.

Is there no lawmaker with expertise in agriculture or natural resources, no knowledgeable and courageous state senator, who will step up and lead the way to do what's right for all of Nebraska?

