

Mike Thompson

From: Marc Groff [mgroff@flatwatergroup.com]
Sent: Wednesday, July 30, 2003 9:31 AM
To: Mike Thompson
Subject: FW: Baseline scenario outline

Mike,

Here is Chuck's follow up.

Marc

-----Original Message-----

From: Mmacps@aol.com [mailto:Mmacps@aol.com]
Sent: Wednesday, July 30, 2003 9:09 AM
To: ableed@dnr.state.ne.us; dlmartin@unlnotes.unl.edu; MMANH@aol.com; Gndwater@aol.com; lwa@lwasf.com; mgroff@flatwatergroup.com
Subject: Baseline scenario outline

I have summarized modifications to model input to create the baseline predictive model scenario runs that are not covered in Mark Groff's July 29 email. We currently plan to complete predictive simulations that start in 2001 and finish in 2040. Stress periods will continue to be monthly with two time steps per month. Initial water levels assigned in the simulations will be the final calculated water levels for December 2000 from run 12p, the final GWTC model, or from the appropriate impact run.

Canal Seepage

Canal seepage is specified in files that represent canal and lateral seepage for a given month and year (e.g., 1940.01.rcc represents canal seepage in January, 1940). The units of these files are in acre-ft/month. To project into the future, canal seepage files from the period January 1981 to December 2000 will be copied to files representing January 2001 to December 2020. This will be repeated for the period January 2021 to December 2040.

This approach was taken to maintain consistency with applied surface water and the resulting surface water recharge. I am going to go over this with Jerry Kenny to check and see how good an approximation this is.

Precipitation Recharge

Precipitation recharge for the period 2001 to 2040 will be based on precipitation from the period 1981 to 2000. These changes will cover all three states. Two cycles of precipitation from 1981 to 2000 will be used to specify conditions for 2001 to 2040.

Ground Water and Surface Water Return Flows

Ground water and surface water return flows for the period 2001 to 2040 will be based on the efficiency specified for 2000.

Municipal Well Pumping

Municipal well pumping is specified and on annual basis for each state. Municipal well pumping will be specified as constant for the period 2001 to 2040 based on the rate specified in 2000.

Pumping and Return Flows for Kansas and Colorado

At this time, the easiest way to specify Kansas and Colorado pumping and return flows is to copy conditions from 1981 to 2000 and to map these stresses to two successive periods from 2001 to 2040.

Evapotranspiration

Evapotranspiration is created using the perl program mket. Two input files to mket will be modified to create conditions for the period 2001 to 2040, basinfactors12p.dbf and monet.dbf. Monet.dbf provides monthly maximum ET rates for three stations, Akron, McCook and Red Cloud. These rates were calculated by Spronk for the period 1918 to 2000 and are distributed to cells by mket. To project into the future, monet.dbf will be modified such that monthly maximum ET rates from January 1981 to December 2000 will be copied to the period January 2001 to December 2020. This will be repeated for the period January 2021 to December 2040. The area covered by phreatophytes is specified in a file etarea.dat. The way phreatophyte area changes over

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time is specified using multipliers contained in basinfactors12p.dbt. For the period 2001 to 2040, all basinfactors assigned to 2000 will continue through 2040. This assumes that phreatophyte acreage will not vary in the future and will be consistent with that defined for 2000.

Drains and Constant Heads

Springs in the model have been assigned an elevation and conductance term. The specifications for 2000 will continue through 2040. Constant heads have been assigned to the Platte and Little Blue Rivers, the eastern Kearney and Nuckolls County boundaries and to the outlet of the Republican River from the model. The specifications as assigned for the period 1918 to 2000 will continue through 2040.

Streams and Rivers

Streams are assigned in the model using the MODFLOW stream package. Stream cells are specified to a row and column, stream connectivity, stream bed conductivity, manning coefficient, stream bed top and bottom elevations. The only aspect of the stream package that has changed over time is the elevation of stream cells in reservoirs. Reservoirs in stream cells have been assigned varying elevations based on monthly data from Mark Phillips. These elevations in general have not varied greatly over time. Since reservoir elevation is somewhat dependent on precipitation, however, reservoir elevations for the period 1981 to 2000 will be mapped twice to the period 2001 to 2040.

Impact Accounting

Impact accounting will be in a form consistent with the impact summaries produced on Willem Schrueder's DVD and website. The output will be modified such that annual accounting will be produced for every year for the period 2001 to 2040. Comparisons will be made against turning pumping off in Nebraska, the Upper Republican, Middle Republican, Lower Republican, and TriBasin NRDs.

If you have any feed back on this please let me know.

Chuck Spalding
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Mike Thompson

From: Marc Groff [mgroff@flatwatergroup.com]
Sent: Wednesday, July 30, 2003 9:30 AM
To: Mike Thompson
Subject: FW: Baseline Scenario Input File Modification Plans

Hey Mike,

I meant to include you on this. I will also forward Chuck Spalding's follow up.

Marc

-----Original Message-----

From: Marc Groff [mailto:mgroff@flatwatergroup.com]
Sent: Tuesday, July 29, 2003 4:51 PM
To: Chuck Spalding (mmacps@aol.com); Derrel Martin (dlmartin@unlnotes.unl.edu); Ann Bleed (ableed@dnr.state.ne.us); Michael G. McDonald (gndwater@aol.com); Dan Morrissey (mmanh@aol.com); Lee Wilson (lwa@lwasf.com)
Cc: Tom Riley (triley@flatwatergroup.com)
Subject: Baseline Scenario Input File Modification Plans

To begin development of the Baseline scenio discussed during the 25 July 2003 meeting at DNR, I am planning to modify six of the input files as follows:

CoWell_Export.txt

This file currently contains the annual cell by cell acreage and pumpage estimates for acres irrigated with a commingled water supply. The file covers the time period 1940 to 2000. Pumpage volumes for the years 2001 through 2040 will be predicted using the formula discussed during the meeting (e.g. $\text{VolPumped}_{2001} = \text{VolPumped}_{1981} * \text{NumWells}_{2000} / \text{NumWells}_{1981}$). The cycle will be repeated twice in order to reach the year 2040 (e.g. 1981 will be used to predict new 2001 and 2021 values). The revised file will cover the years 1940 to 2040 and will contain acreage estimates equal to the year 2000 estimates for the years 2001 through 2040.

GWOnlyWellsExport.txt

This file currently contains the annual cell by cell acreage and pumpage estimates for acres irrigated only with groundwater. The file covers the time period 1940 to 2000. Pumpage volumes for the years 2001 through 2040 will be predicted using the formula discussed during the meeting (e.g. $\text{VolPumped}_{2001} = \text{VolPumped}_{1981} * \text{NumWells}_{2000} / \text{NumWells}_{1981}$). The cycle will be repeated twice in order to reach the year 2040 (e.g. 1981 will be used to predict new 2001 and 2021 values). The revised file will cover the years 1940 to 2040 and will contain acreage estimates equal to the year 2000 estimates for the years 2001 through 2040.

SWCoLandsWDelivery_Export.txt

This file currently contains the annual cell by cell acreage and surface water delivery estimates for acres irrigated with a commingled water supply. The file covers the time period 1940 to 2000. Surface water delivery estimates for the years 2001 through 2040 will be predicted by cycling through the current 1981 through 2000 estimates (e.g. $\text{SWDelivery}_{2001} = \text{SWDelivery}_{1981}$). The cycle will be repeated twice in order to reach the year 2040 (e.g. 1981 will be used to predict new 2001 and 2021 values). As the chart in the attached spreadsheet shows, the change in the number of commingled acres is minor in comparison to the change in groundwater only irrigated acres; therefore, the pinning of irrigated acreage estimates at year 2000 levels for groundwater irrigation, but allowing the surface water irrigated acres to fluctuate should not be a significant issue.

SWIrrOnlyLandsWDelivery_Export.txt

This file currently contains the annual cell by cell acreage and surface water delivery estimates for acres irrigated with a only with surface water. The file covers the time period 1940 to 2000. Surface water delivery estimates for the years 2001 through 2040 will be predicted by cycling through the current 1981 through 2000 estimates (e.g. $\text{SWDelivery}_{2001} = \text{SWDelivery}_{1981}$). The cycle will be repeated twice in order to reach the year 2040 (e.g. 1981 will be used to predict new 2001 and 2021 values). As the chart in the attached spreadsheet shows, the change in the number of surface water only irrigated acres is minor in comparison to the change in groundwater only irrigated acres; therefore, the pinning of irrigated acreage estimates at year 2000 levels for groundwater irrigation, but allowing the surface water irrigated acres to fluctuate should not be a significant issue.

RiverPumpers_NE_061003.txt

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This file currently contains the annual cell by cell delivery estimates of irrigation water pumped directly from a river/stream. The values in this file were multiplied by the stipulated value of 0.25 in order to estimate the return flow value that was input into the model. The file covers the time period from 1940 to 2000. Estimates for the years 2001 through 2040 will be predicted by cycling through the current 1981 through 2000 estimates (e.g. PredictedDelivery2001=EstimatedDelivery1981). The cycle will be repeated twice in order to reach the year 2040 (e.g. 1981 will be used to predict new 2001 and 2021 values).

PrivateCanalLosses_to_Fields_NE_061003.txt

This file currently contains additional applied water for the private canals. The values in this file were multiplied by the stipulated value of 0.40 in order to estimate the return flow value that was input into the model. The file covers the time period from 1940 to 2000. Estimates for the years 2001 through 2040 will be predicted by cycling through the current 1981 through 2000 estimates (e.g. PredictedDelivery2001=EstimatedDelivery1981). The cycle will be repeated twice in order to reach the year 2040 (e.g. 1981 will be used to predict new 2001 and 2021 values).

In addition to modifying these six input files, modifications will also need to be made to the canal and reservoir seepage input files among others. My understanding is that Chuck will be taking care of modifying the remaining input files.

Please let me know if these modification plans need to be revised.

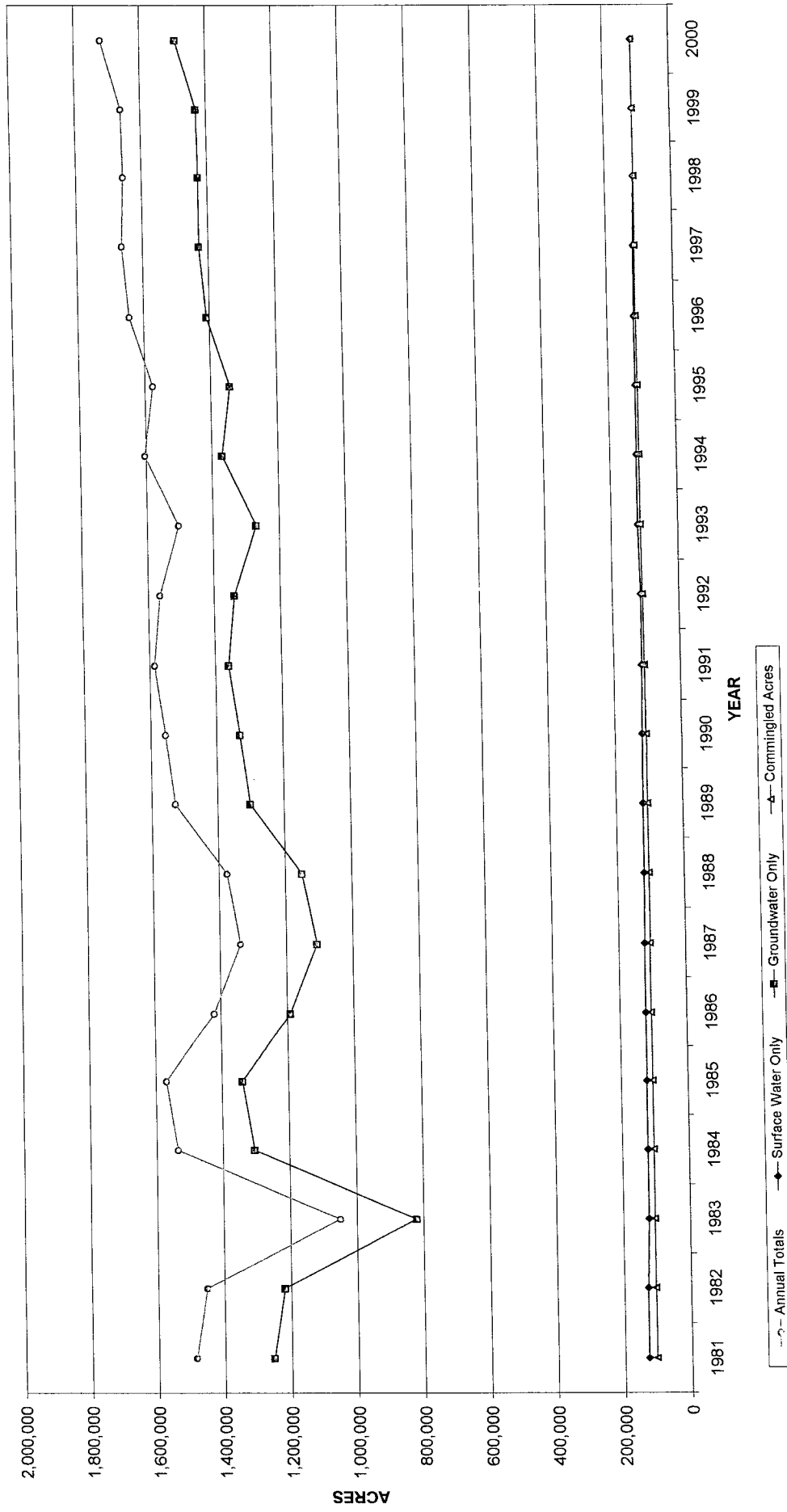
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ANNUAL IRRIGATED ACREAGE TOTALS REPUBLICAN RIVER GROUNDWATER MODEL AREA



Year	Adams	Buffalo	Chase	Clay	Dawson	Duval	Dundee	Franklin	Frontier	Greene	Harlan	Hays	Hitchcock	Keasbey	Keith	Lincoln	Nuckolls	Perkins	Phelps	Red Willow	Webster	Annual Totals
1881	31,588	4,258	142,522	3,312	54,432	4,421	78,710	62,985	63,400	47,200	63,800	33,700	178,950	48,012	121,739	25,392	112,940	210,300	59,200	36,990	1,487,051	
1882	30,810	4,096	150,370	3,496	52,944	4,421	76,620	73,915	63,200	43,600	61,100	34,200	172,900	49,841	107,468	22,272	103,210	220,500	56,100	26,910	1,450,873	
1883	29,308	3,258	100,228	2,892	36,888	4,421	62,100	48,735	49,900	38,000	41,100	25,300	111,900	43,979	80,266	18,240	91,040	138,400	35,100	24,210	1,050,885	
1884	28,250	4,370	143,068	3,832	57,072	4,421	96,060	68,730	70,000	48,500	64,600	35,300	174,900	57,084	118,456	27,744	141,180	212,100	45,900	32,940	1,335,707	
1885	29,162	4,784	135,587	3,874	61,992	4,421	92,135	73,245	62,500	46,400	68,200	49,100	172,700	59,117	121,672	29,808	136,845	216,800	57,800	32,490	1,420,946	
1886	28,542	4,180	121,093	3,444	52,992	4,541	88,514	74,100	64,300	43,700	61,800	35,600	168,100	56,079	107,287	26,544	110,010	196,400	46,400	31,140	1,335,551	
1887	27,818	3,632	130,299	3,172	48,336	4,421	90,270	67,165	64,800	42,100	61,900	29,700	160,200	45,359	92,393	22,272	110,940	191,000	51,400	28,440	1,377,006	
1888	28,273	3,796	139,073	3,254	52,224	4,421	77,732	68,970	62,100	51,000	68,900	29,400	166,500	48,105	113,364	23,136	120,060	227,400	53,800	35,820	1,326,863	
1889	33,008	4,098	145,781	3,652	55,176	4,421	87,676	76,665	60,500	51,000	71,000	34,500	186,500	52,729	113,565	23,328	118,190	230,000	57,300	37,060	1,555,616	
1890	33,662	4,298	156,568	3,714	55,176	4,421	85,995	75,190	60,500	49,900	72,200	34,100	187,300	52,595	120,064	24,816	118,890	235,900	55,900	36,250	1,580,086	
1891	34,850	4,254	163,309	3,684	56,016	4,421	82,252	71,535	69,300	49,900	68,300	34,100	191,900	48,843	120,064	25,248	124,010	222,900	58,700	40,770	1,564,962	
1892	35,127	4,180	164,448	3,644	52,228	4,421	83,281	71,535	69,800	45,300	68,900	27,100	176,900	48,987	111,689	25,624	129,620	241,000	58,400	40,770	1,564,962	
1893	34,029	4,308	147,824	3,682	55,096	4,421	82,788	71,465	69,500	45,300	70,700	29,000	191,900	49,513	123,280	26,064	126,697	241,000	60,000	42,460	1,575,970	
1894	35,929	4,134	156,628	3,644	54,144	4,481	88,862	78,900	60,800	49,600	68,700	33,900	189,800	49,178	126,897	26,964	133,630	231,000	54,400	40,560	1,643,714	
1895	35,188	4,230	166,940	3,694	54,912	4,421	89,320	78,900	60,800	51,982	72,800	29,800	196,100	52,930	141,504	27,996	133,230	237,000	55,800	41,560	1,663,746	
1896	36,336	4,424	189,148	3,930	54,912	4,421	93,360	86,360	69,000	55,100	72,700	36,000	217,000	55,878	137,819	27,024	126,720	238,700	59,600	38,570	1,719,595	
1897	36,499	4,152	158,548	3,754	53,064	4,421	93,360	86,360	69,000	55,100	72,700	36,000	217,000	55,878	137,819	27,024	126,720	238,700	59,600	38,570	1,719,595	
1898	37,772	4,082	161,600	3,688	56,088	4,361	77,400	87,785	63,300	49,500	74,100	30,400	199,200	55,208	132,258	30,000	134,450	231,100	57,100	49,650	1,669,708	
1899	37,772	4,082	161,600	3,688	56,088	4,361	77,400	87,785	63,300	49,500	74,100	30,400	199,200	55,208	132,258	30,000	134,450	231,100	57,100	49,650	1,669,708	
2000	38,798	4,492	165,300	3,732	58,608	4,361	84,000	86,695	57,300	61,700	77,900	43,800	204,400	54,203	141,370	29,856	138,900	244,700	57,900	47,340	1,719,595	
Average 1881-2000	32,695	4,156	148,772	3,367	53,761	4,424	84,573	75,558	60,365	48,614	66,660	34,900	30,915	179,673	51,323	118,339	122,698	216,910	54,260	37,161	1,524,863	
Average 1896-2000	37,073	4,278	164,307	3,728	55,570	4,397	84,108	85,871	60,320	54,255	74,700	31,160	198,240	54,578	139,141	29,571	133,600	237,840	57,040	44,460	1,668,697	

Year	Adams	Buffalo	Chase	City	Dawson	Deuel	Dundy	Franklin	Frontier	Furnas	Gosper	Hartman	Havens	Hitchcock	Kearney	Kelth	Lincoln	Nuckolls	Perkins	Pheasant	Red Willow	Webster	Annual Totals
1881	31,588	4,256	141,863	3,312	38,010	3,180	74,284	54,708	66,400	30,191	49,138	57,194	34,473	17,731	151,005	39,127	117,098	19,233	112,940	141,796	32,182	31,279	1,252,857
1882	30,810	4,096	149,731	3,486	34,522	3,180	72,194	65,538	63,200	25,991	47,338	55,994	34,093	18,231	145,555	40,956	102,815	16,113	103,210	151,396	29,082	21,189	1,218,680
1883	20,308	3,258	99,589	2,632	18,486	3,180	57,674	40,293	49,900	21,152	26,510	36,279	30,573	9,365	86,119	35,084	75,649	12,123	91,040	72,859	8,288	18,452	820,813
1884	28,350	4,370	142,429	3,632	38,650	3,180	62,234	61,288	70,000	29,452	48,810	61,178	38,023	19,365	148,919	48,189	113,839	21,627	141,180	145,559	18,088	27,182	1,305,699
1885	29,462	4,784	134,948	3,874	43,570	3,180	87,709	64,803	70,000	29,652	48,810	61,178	49,023	22,465	147,918	50,232	117,055	23,691	136,645	152,259	30,988	26,732	1,386,771
1886	29,542	4,180	120,454	3,444	34,570	3,300	84,088	65,658	62,700	29,652	40,510	64,279	32,523	15,265	142,519	47,184	102,650	20,427	110,910	128,859	18,598	25,382	1,190,905
1887	27,818	3,632	129,660	3,172	29,914	3,180	75,844	58,723	54,800	26,652	40,510	56,779	32,523	13,365	128,019	37,278	87,776	16,155	110,940	124,459	24,598	22,662	1,108,460
1888	29,273	3,756	138,434	3,254	33,802	3,180	73,306	61,135	54,800	25,883	47,298	55,981	29,070	14,404	134,381	36,474	93,033	17,167	110,800	131,842	24,776	29,189	1,150,785
1889	33,008	4,098	145,142	3,652	36,754	3,180	83,250	68,830	62,100	36,883	54,136	62,861	29,370	13,804	160,881	39,221	108,711	17,455	120,600	160,242	28,178	30,908	1,302,641
1890	33,662	4,298	155,929	3,714	36,754	3,180	81,570	68,355	60,500	34,783	56,356	62,861	34,470	16,204	159,881	43,844	108,912	19,135	118,890	162,842	31,678	32,168	1,328,585
1891	34,650	4,254	163,309	3,684	37,594	3,180	87,828	69,400	59,300	33,683	57,958	62,361	33,370	14,204	165,981	43,710	115,813	19,667	118,690	166,742	29,878	33,338	1,350,454
1892	35,127	4,136	147,824	3,604	33,778	3,180	88,362	68,313	57,600	31,363	54,858	61,202	27,023	11,120	165,981	39,958	115,813	18,921	124,390	155,742	30,979	34,438	1,270,737
1893	34,029	4,308	157,112	3,682	36,634	3,180	86,352	72,016	56,500	33,874	55,169	63,702	33,823	12,820	165,981	40,628	118,627	18,009	129,620	145,371	32,397	36,147	1,399,963
1894	35,629	4,134	156,628	3,644	35,722	3,240	84,438	68,976	54,100	32,174	57,059	67,092	33,423	13,720	170,061	44,045	136,851	19,161	133,230	163,670	26,797	33,987	1,346,246
1895	35,569	4,230	166,940	3,654	36,154	3,180	84,894	68,976	60,800	34,596	57,059	67,092	35,923	15,620	170,061	45,787	133,166	20,121	126,720	171,370	30,987	32,657	1,468,246
1896	36,936	4,424	169,148	3,830	36,480	3,180	81,534	78,236	59,000	37,674	62,982	71,002	38,123	14,720	168,961	46,983	136,045	23,087	134,460	163,770	29,497	41,467	1,431,200
1897	36,999	4,152	158,548	3,754	37,425	3,180	78,834	76,671	62,300	35,074	62,982	71,002	39,023	14,320	173,161	46,323	139,551	26,072	134,700	170,370	28,197	41,467	1,431,200
1898	37,772	4,092	161,600	3,666	39,849	3,120	82,974	78,381	62,200	32,074	60,982	73,302	43,723	17,020	178,361	45,318	139,663	22,953	138,900	177,370	30,297	41,007	1,491,087
2000	38,798	4,492	185,300	3,732	42,389	3,120	80,174	79,521	57,300	44,274	64,082	73,302	43,723	17,020	178,361	45,318	139,663	22,953	138,900	177,370	30,297	41,007	1,491,087
Average 1881-2000	32,695	4,156	148,453	3,657	35,667	3,183	80,147	67,016	60,385	31,677	52,074	62,735	34,635	15,078	153,578	42,438	114,136	19,468	122,698	151,643	27,432	31,389	1,294,548
Average 1886-2000	37,073	4,278	164,307	3,728	38,457	3,166	79,682	76,557	60,320	35,830	60,559	72,242	38,043	15,080	172,201	45,693	135,255	22,667	133,600	170,510	29,437	36,127	1,437,805

Year	Adams	Buffalo	Chase	Clay	Dawson	Duval	Dundell	Franklin	Frontier	Furnas	Geopier	Harlan	Hayas	Hitchcock	Kearney	Keith	Lincoln	Nuckolls	Parkins	Phelps	Red Willow	Wagwater	Annual Totals
1891	0	0	639	0	7,652	106	3,776	4,849	0	11,256	11,256	3,011	0	2,848	18,906	32	2,230	4,074	0	41,825	11,487	5,286	138,925
1892	0	0	639	0	7,652	106	3,776	4,849	0	11,256	11,256	3,011	0	2,848	18,906	32	2,230	4,074	0	41,825	11,487	5,286	138,925
1893	0	0	639	0	7,652	106	3,776	4,849	0	11,256	11,256	2,963	0	2,752	17,187	32	2,230	4,032	0	38,201	11,038	5,316	124,914
1894	0	0	639	0	7,652	106	3,776	4,849	0	11,185	11,223	2,963	0	2,752	17,187	32	2,230	3,750	0	38,787	11,038	5,316	123,897
1895	0	0	639	0	7,652	106	3,776	4,849	0	11,185	11,223	2,963	0	2,752	17,187	32	2,230	3,750	0	38,787	11,038	5,316	123,897
1896	0	0	639	0	7,652	106	3,776	4,849	0	11,185	11,223	2,963	0	2,752	17,187	32	2,230	3,750	0	38,787	11,038	5,316	123,897
1897	0	0	639	0	7,652	106	3,776	4,757	0	11,185	11,082	2,963	0	2,752	17,187	32	2,230	3,750	0	38,686	11,038	5,316	123,122
1898	0	0	639	0	7,652	106	3,776	4,757	0	10,898	11,078	2,737	0	2,421	17,325	32	2,230	3,407	0	38,984	10,568	4,985	120,548
1899	0	0	639	0	7,652	106	3,776	4,231	0	10,848	11,078	2,737	0	2,421	17,325	32	2,230	3,338	0	38,841	10,518	4,455	119,415
1900	0	0	639	0	7,531	106	3,776	4,067	0	10,848	10,980	2,737	0	2,421	17,208	32	2,190	3,338	0	38,644	10,442	4,455	119,415
1901	0	0	639	0	7,531	106	3,776	4,067	0	10,848	10,937	2,737	0	2,421	17,101	32	2,190	2,450	0	38,376	10,352	4,151	116,795
1902	0	0	639	0	7,531	106	3,776	4,390	0	10,848	10,937	2,737	0	2,421	17,101	32	2,190	2,450	0	38,193	10,259	3,790	115,357
1903	0	0	639	0	7,531	106	3,776	4,390	0	11,685	10,832	3,203	0	2,935	17,078	32	2,160	2,445	0	38,283	11,267	4,985	121,166
1904	0	0	639	0	7,531	106	3,776	4,390	0	11,685	10,832	3,203	0	2,935	17,078	32	2,160	2,445	0	38,283	11,267	4,985	121,166
1905	0	0	639	0	7,531	106	3,776	4,275	0	11,322	10,832	3,203	0	2,935	17,079	32	2,160	2,955	0	38,284	11,085	4,985	120,307
1906	0	0	639	0	7,531	106	3,776	4,275	0	11,322	10,832	3,203	0	2,935	17,079	32	2,160	2,955	0	38,284	11,085	4,985	120,307
1907	0	0	639	0	7,510	106	3,776	4,275	0	11,016	10,848	3,201	0	2,954	16,867	32	2,190	2,882	0	38,180	10,967	4,985	119,820
1908	0	0	639	0	7,510	106	3,776	4,275	0	11,016	10,848	3,201	0	2,954	16,867	32	2,190	2,882	0	38,180	10,967	4,985	119,820
1909	0	0	639	0	5,917	106	3,776	4,275	0	10,546	10,057	3,201	0	2,854	16,789	32	805	2,685	0	36,104	10,657	4,985	114,579
1910	0	0	639	0	5,917	106	3,776	4,275	0	10,546	9,920	3,201	0	2,854	16,601	32	805	2,685	0	36,087	10,742	4,985	114,432
1911	0	0	639	0	5,917	106	3,776	4,275	0	10,546	9,920	3,201	0	2,854	16,601	32	805	2,685	0	36,087	10,742	4,985	114,432
2000	0	0	0	0	5,917	106	3,776	4,275	0	10,546	9,920	3,201	0	2,823	16,521	32	805	2,776	0	37,934	10,742	4,985	113,859
Average 1891-2000	0	0	319	0	7,341	106	3,776	4,439	0	11,059	10,841	3,007	0	2,739	17,220	32	2,000	3,135	0	38,762	10,902	4,922	120,601
Average 1896-2000	0	0	0	0	6,554	106	3,776	4,275	0	10,795	10,239	3,201	0	2,884	16,752	32	1,359	2,523	0	36,082	10,815	4,985	116,378

Year	Adams	Buffalo	Chase	City	Dawson	Davis	Dundy	Franklin	Frontier	Furnas	Gosper	Hayden	Hayes	Hitchcock	Kearney	Keith	Lincoln	Nicholls	Parkina	Pheips	Red Willow	Webster	Annual Total
1981	0	0	0	0	10,770	1,135	650	3,438	0	5,753	3,207	2,095	77	13,121	8,239	8,853	2,424	2,085	0	27,479	15,511	442	105,268
1982	0	0	0	0	10,770	1,135	650	3,428	0	5,753	3,287	2,095	77	13,121	8,239	8,853	2,424	2,085	0	27,782	15,511	442	105,951
1983	0	0	0	0	10,770	1,135	650	3,450	0	5,663	3,368	2,058	77	13,183	8,494	8,853	2,388	2,085	0	27,339	15,764	442	105,727
1984	0	0	0	0	10,770	1,135	650	3,450	0	5,663	3,368	2,058	77	13,183	8,494	8,853	2,388	2,367	0	27,774	15,764	442	106,444
1985	0	0	0	0	10,770	1,135	650	3,685	0	5,663	3,470	2,058	77	13,183	8,494	8,853	2,388	2,367	0	27,884	15,764	442	106,684
1986	0	0	0	0	10,770	1,135	650	3,685	0	5,663	3,508	2,058	77	13,183	8,494	8,853	2,388	2,367	0	27,884	15,764	442	106,850
1987	0	0	0	0	10,770	1,135	650	3,516	0	5,537	3,565	2,002	30	12,875	8,494	8,853	2,424	2,274	0	28,174	15,058	316	106,970
1988	0	0	0	0	10,770	1,135	650	3,604	0	5,369	3,654	2,002	30	12,875	8,613	8,853	2,424	2,343	0	28,317	15,106	459	106,913
1989	0	0	0	0	10,690	1,135	650	3,604	0	5,369	3,654	2,002	30	12,875	8,613	8,853	2,463	2,514	0	28,514	15,162	459	106,808
1990	0	0	0	0	10,690	1,135	650	3,748	0	5,369	3,807	2,002	30	12,875	8,718	8,853	2,463	3,431	0	28,782	15,272	763	109,226
1991	0	0	0	0	10,690	1,135	650	4,345	0	5,369	3,807	2,002	30	12,875	8,718	8,853	2,463	3,536	0	28,965	15,389	1,124	113,300
1992	0	0	0	0	10,690	1,135	650	4,804	0	5,741	3,808	2,095	77	13,145	8,959	8,853	2,463	3,948	0	29,066	16,315	1,346	113,300
1993	0	0	0	0	10,690	1,135	650	4,805	0	5,741	3,808	2,095	77	13,145	8,959	8,853	2,463	3,948	0	29,066	16,315	1,346	114,182
1994	0	0	0	0	10,690	1,135	650	4,839	0	6,104	3,808	2,095	77	13,145	8,959	8,853	2,463	4,221	0	29,066	16,508	1,346	114,649
1995	0	0	0	0	10,690	1,135	650	4,839	0	6,104	3,992	2,097	77	13,145	9,098	8,853	2,463	4,221	0	29,140	16,508	1,346	114,649
1996	0	0	0	0	10,612	1,135	650	4,839	0	6,410	3,992	2,097	77	13,126	9,170	8,853	2,463	4,419	0	29,143	16,835	1,348	115,271
1997	0	0	0	0	10,612	1,135	650	4,839	0	6,410	3,992	2,097	77	13,126	9,170	8,853	2,463	4,419	0	29,143	16,835	1,348	115,271
1998	0	0	0	0	10,322	1,135	650	4,839	0	6,880	3,750	2,097	77	13,126	9,270	8,853	902	4,419	0	29,316	16,945	1,348	113,928
1999	0	0	0	0	10,322	1,135	650	4,839	0	6,880	3,888	2,097	77	13,126	9,498	8,853	902	4,419	0	29,242	16,860	1,348	114,075
2000	0	0	0	0	10,322	1,135	650	4,839	0	6,880	3,888	2,097	77	13,126	9,517	8,853	902	4,427	0	29,395	16,860	1,348	114,648
Average 1981-2000	0	0	0	0	10,753	1,135	650	4,103	0	5,979	3,645	2,063	65	13,087	8,775	8,853	2,202	3,192	0	28,505	15,946	850	109,714
Average 1986-2000	0	0	0	0	10,558	1,135	650	4,839	0	6,631	3,902	2,097	77	13,186	9,297	8,853	1,526	4,381	0	29,247	16,767	1,348	114,514

Mike Thompson

From: Marc Groff [mgroff@flatwatergroup.com]
Sent: Wednesday, July 30, 2003 12:09 PM
To: 'Mike Thompson'
Subject: RE: Baseline scenario outline

Hey Mike,

The irrigated acres for all areas are based on county NASS statistics. For counties partially included in the model area, the irrigated acres were initially prorated based on the percentage of the county in the model area and then refined by estimating a reasonable number of irrigated acres per well after adjusting for surface water irrigated acres.

Marc

-----Original Message-----

From: Mike Thompson [mailto:mthompson@dnr.state.ne.us]
Sent: Wednesday, July 30, 2003 11:52 AM
To: Marc Groff
Subject: RE: Baseline scenario outline

Marc,

Thanks for the inclusion. Do you know if the irrigated acres figures for the Platte basin came from the cohyst study?

Mike

-----Original Message-----

From: Marc Groff [mailto:mgroff@flatwatergroup.com]
Sent: Wednesday, July 30, 2003 9:31 AM
To: Mike Thompson
Subject: FW: Baseline scenario outline

Mike,

Here is Chuck's follow up.

Marc

-----Original Message-----

From: Mmacps@aol.com [mailto:Mmacps@aol.com]
Sent: Wednesday, July 30, 2003 9:09 AM
To: ableed@dnr.state.ne.us; dlmartin@unlnotes.unl.edu; MMANH@aol.com; Gndwater@aol.com; lwa@lwasf.com; mgroff@flatwatergroup.com
Subject: Baseline scenario outline

I have summarized modifications to model input to create the baseline predictive model scenario runs that are not covered in Mark Groff's July 29 email. We currently plan to complete predictive simulations that start in 2001 and finish in 2040. Stress periods will continue to be monthly with two time steps per month. Initial water levels assigned in the simulations will be the final calculated water levels for December 2000 from run 12p, the final GWTC model, or from the appropriate impact run.

Canal Seepage

Canal seepage is specified in files that represent canal and lateral seepage for a given month and year (e.g., 1940.01.rcc represents canal seepage in January, 1940). The units of these files are in acre-ft/month. To project into the future, canal seepage files from the period January 1981 to December 2000 will be copied to files

7/30/2003

DNR 017793