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U.S. Army Corps of Engineers

Omaha District

Monthly Drought Report

April 2006

US Army Corps
of Engineers
Omaha District

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CURRENT CONDITIONS

The current Omaha District drought has impacted parts of the Missouri River Basin including the entire Upper Missouri River Basin in Montana and Wyoming since 2000. Long term (72-month) precipitation departures range from near normal to fifteen inch deficits depending on the location within the basin. Water year 2006 snow pack numbers as of April 1 continue to look better than in recent years past. The snowpack above Ft. Peck remains at 105% of normal; Ft. Peck to Garrison is 92% of normal; the North Platte River Basin in Colorado and Wyoming is 107% of normal; and the South Platte River Basin in Colorado and Wyoming is 106% of normal. Given the recent spring moisture, there are no areas within the basin that are exhibiting Severe or Exceptional drought conditions. Currently, portions of Nebraska exhibits persistent drought conditions, South Dakota and Wyoming are exhibiting some drought improvement, and North Dakota and Montana continue toward drought recovery. Continued spring moisture accumulation is still necessary to aid the drought recovery throughout the basin, especially the recovering of the storage in the mainstem reservoirs. However, current drought indicators including the Palmer Drought Severity Index and the Drought Monitor continue to reflect improvements within the basin.

Precipitation Departures

Precipitation accumulations in the Western U.S. have largely affected the severity and extent of the drought since 2000. Precipitation departures from normal during the last 72-months for the United States are shown in Figure 1. In much of Montana, accumulated precipitation is well below normal (deficit of 5 to 15 inches). The majority of Wyoming's accumulated precipitation is 10 to 15 inches below normal for the observation period. Southeast Nebraska and southwest Iowa have received from near normal to 10 inches less than normal precipitation. The Dakotas have largely received a surplus (10 to 15 inches) of precipitation in the central and eastern regions, while western regions remain normal to 5 inches below normal. The South Platte River Basin in Colorado still shows precipitation deficits of 10 to 15 inches during a majority of the 72-month period.

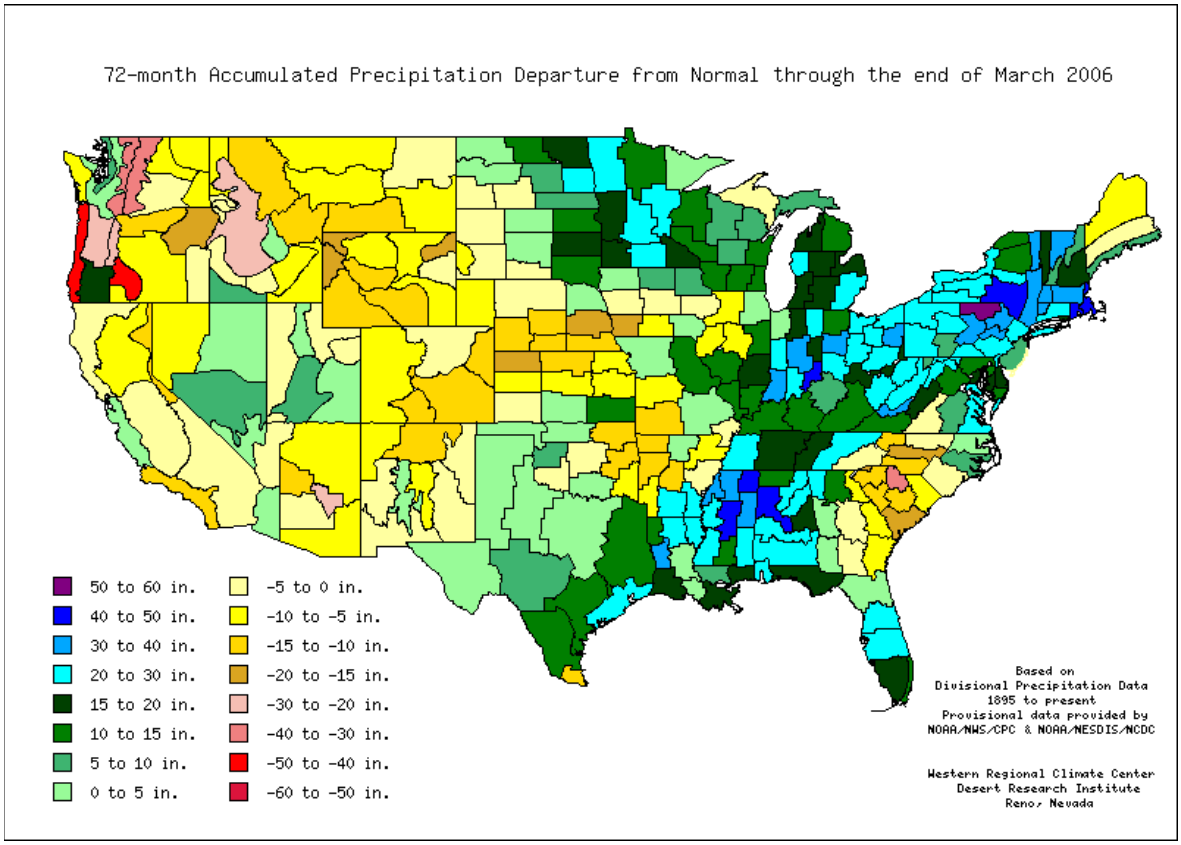


Figure 1 – 72 month Precipitation Departure From Normal
http://www.wrcc.dri.edu/cgi-bin/spiFmap.pl?dep72

The 12-month precipitation accumulation in Figure 2 indicates that precipitation throughout much of the western and northwestern District is from normal to six-inches above normal. However, small areas of deficits can still be found in southeast Nebraska.

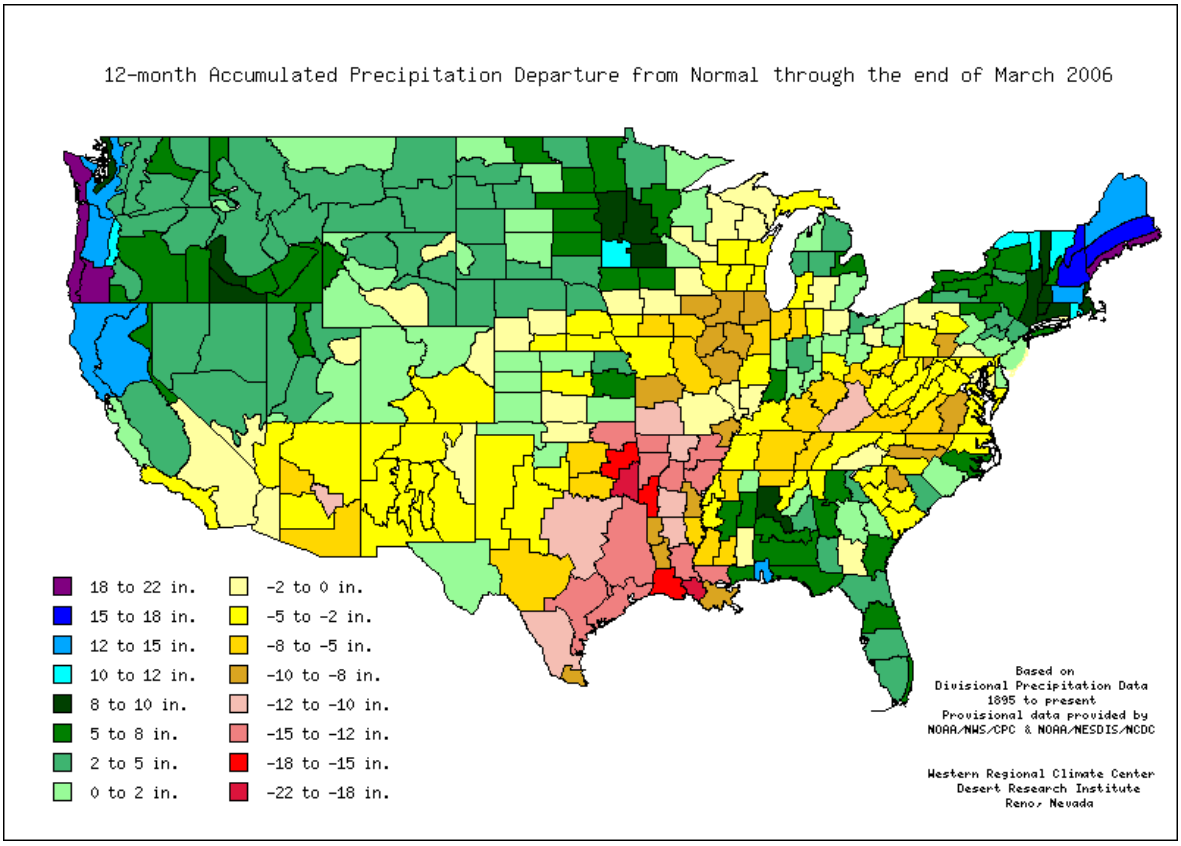


Figure 2 – 12 month Precipitation Departure From Normal
http://www.wrcc.dri.edu/cgi-bin/spiFmap.pl?dep12

The three-month period (Figure 3) shows a significant improvement in precipitation departures. The entire basin shows normal to a two-inch surplus in precipitation. This is a result of the recent precipitation the area has been receiving.

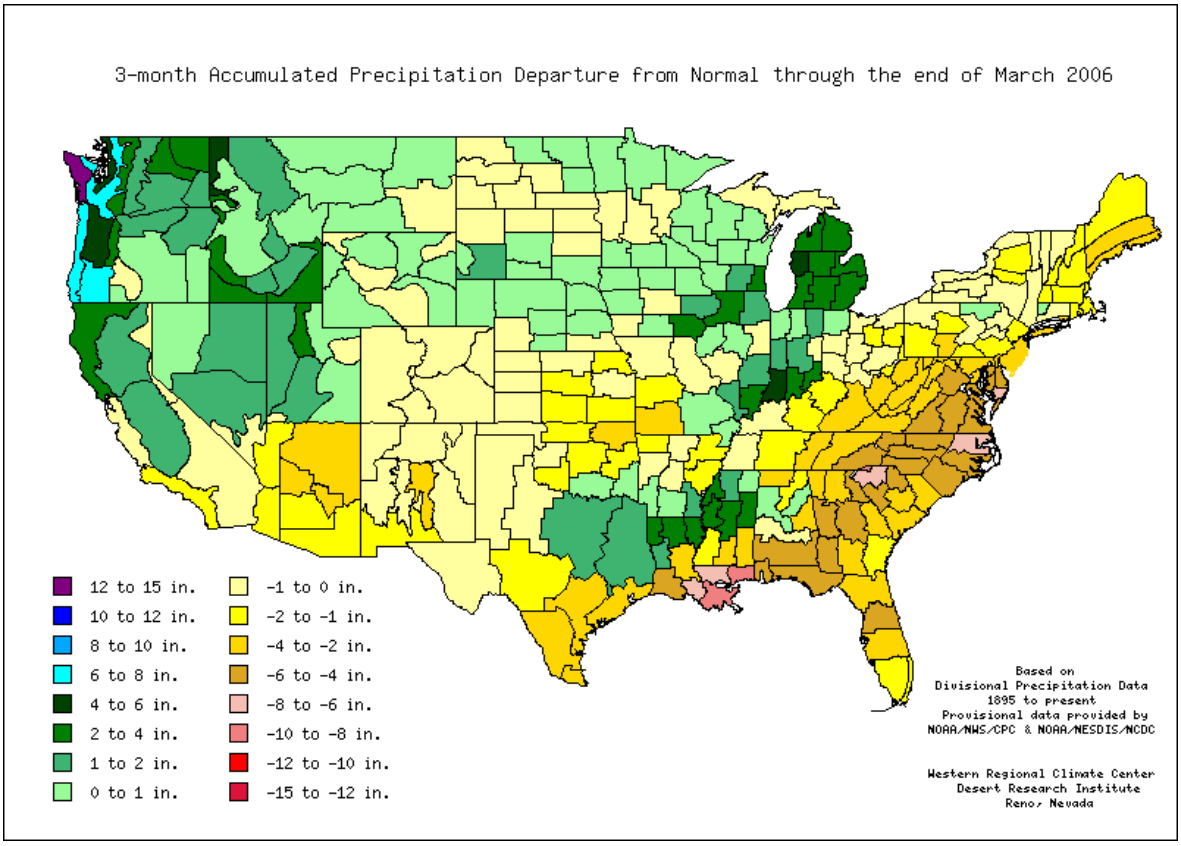


Figure 3 – 3 month Precipitation Departure From Normal
http://www.wrcc.dri.edu/cgi-bin/spiFmap.pl?dep03

During March, the majority of the basin moved into a near normal to precipitation surplus (Figure 4).

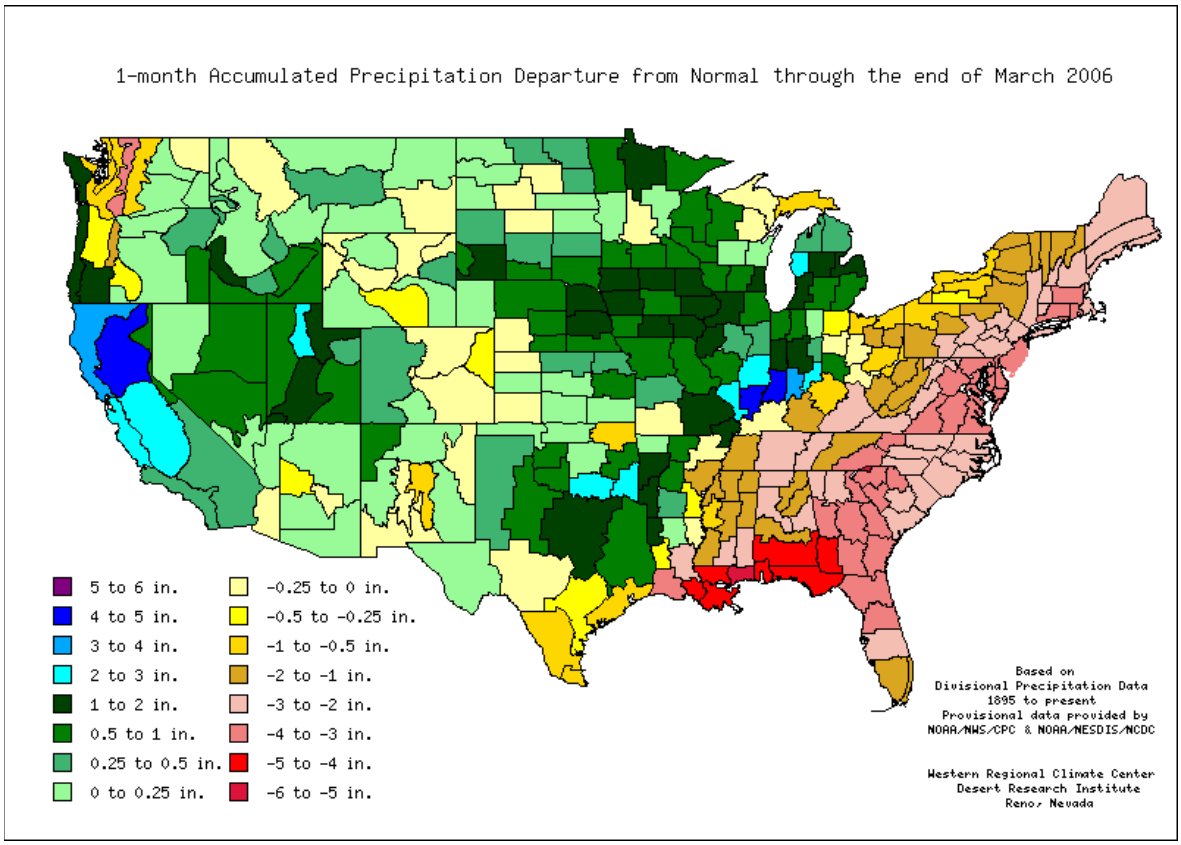


Figure 4 – 1 month Precipitation Departure From Normal
http://www.wrcc.dri.edu/cgi-bin/spiFmap.pl?dep01

Water Year 2006 Mountain Snow (from USACE Northwest Division Missouri River Water Management Division).

Summary of Winter 2005-2006. The Missouri River runoff for 2005 was 20.3 MAF, 81% of normal. This marked the sixth consecutive year of less than normal runoff in the basin. The continued drought has taxed the System storage leaving upstream reservoir levels very low, much like what occurred in the drought of the mid 1980's and early 1990's. The forecasted runoff for 2006 is 19.5 MAF, 77% of normal. The runoff for January 2006 was 1.3 MAF, 181% of normal. The runoff for February 2006 was 1.0 MAF, 96% of normal. The runoff for March 2006 was 1.6 MAF, 55% of normal. As of April 1, the snowpack in the basin is at about normal levels. The snowpack above Fort Peck is at 105% of normal for this time of the year. The snowpack in the reach from Fort Peck to Garrison is 92% of normal. The North Platte and South Platte River basins in Wyoming and Colorado are above normal - 107% and 106% of normal, respectively.

The following tabulation is a summary of this year's mountain snowpack accumulations and the CY 2006 runoff forecast for the first of each month. The main stem reservoirs are significantly below their base of the annual flood control zones due to six consecutive years of drought and the system stands poised to handle significant runoff if that were to occur during 2006.

CY 2006 Mountain Snowpack Accumulations in Percent of Normal Peak

Location	Jan	Feb	Mar	Apr	May	Jun	Jul
Above Fort Peck Dam	108%	112%	105%	105%	.	.	.
Fort Peck to Garrison	97%	99%	96%	92%	.	.	.
Percent of Normal Total Acc.	102%	105%	100%	98%	.	.	.
South Platte	131%	117%	111%	106%	.	.	.
North Platte	122%	117%	107%	107%.	.	.	.

Forecasted CY 2006 Missouri River Basin Annual Runoff in MAF

Location	Jan	Feb	Mar	Apr	May	Jun	Jul
Above Sioux City, Iowa.	21.0	20.0	20.0	19.5	.	.	.
Percent of Normal 25.2 MAF	83%	79%	79%	77%	.	.	.

SNOTEL Mountain snowpack station data is provided by the National Resource Conservation Service. Normally by April 15, 100 percent of the peak accumulation has occurred. The January through June 2006 forecasted runoff above Sioux City is 12.0 MAF, 73 percent of normal. The 2006 Calendar Year runoff forecast for above Sioux City is 19.5 MAF, 77 percent of normal. As stated earlier, the Missouri River basin is enduring its sixth consecutive year of drought. As per the National Weather Service drought severity index, as of March 28, 2006, the current drought intensity is considered "normal" or "abnormally dry" in significant portions of the Missouri River basin east of the Missouri River. West of the Missouri River, where most of the inflow to the System occurs, the drought is considered "normal" in most of Montana and North Dakota and

"abnormally dry" or "moderate" in most of Wyoming, Colorado, Nebraska and western South Dakota. There are **no** areas in the Missouri River basin in the "extreme" or "expectional" drought levels as there has been in previous years. Historically, precipitation accounts for 25% of the total inflow into the System. Runoff from mountain snowpack and plains snow account for 50% and 25%, respectively.

The table above labeled CY 2006 Mountain Snowpack, gives information in percent of average for the two significant snowpack accumulation reaches of Fort Peck and Fort Peck to Garrison. The snow melts during the May through July timeframe and provides significant main stem inflow which is stored to prevent downstream flooding and later used to meet main stem authorized project purposes. Even knowing the amount of snow at the first of each month for selected mountain snowpack areas results in considerable runoff variability because the weather conditions during the melt period greatly influences the runoff yield. The total percent of normal accumulation are shown for the first of each month through May. For the period of May through July the percentages shown are a percent of the peak accumulation for the year to indicate the remaining snow to melt in the mountains.

Drought Indicators
The Palmer Drought Severity Index and the Drought Monitor are two commonly used drought-indicator products that convey both short-term and long-term drought conditions and impacts. Both the Palmer Index and Drought Monitor depict some regions exhibiting varying degrees of drought in Nebraska, South Dakota, Wyoming, and Montana, which have been suffering from drought since 2000.

Palmer Drought Severity Index
The Palmer Drought Severity Index (PDSI) is a meteorological drought index that monitors the hydrologic water balance including the basic terms such as precipitation, evapotranspiration, soil recharge, runoff, and moisture loss. The purpose of this index is to provide standardized measurements of the moisture balance in a region without taking into account streamflow, lake and reservoir levels, and other hydrologic impacts. PDSI is a multi-month drought index; therefore, it responds well and is more suitable for short-term droughts.

Changes to the PDSI are more immediate in response to heavy precipitation over short periods. The PDSI shown in Figure 5 reflects near normal to extremely moist conditions in the majority of the Omaha District.

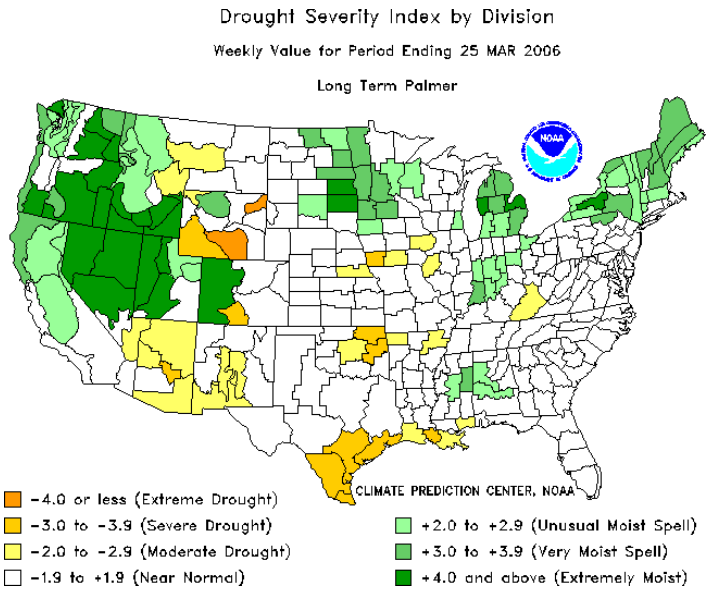


Figure 5 – Long-Term Palmer Drought Indicator Ending 25 Mar 2006
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/palmer.gif

Drought Monitor

The Drought Monitor is a multi-agency comprehensive drought classification scheme updated weekly by the National Drought Mitigation Center. The Drought Monitor combines information from the Palmer Drought Index, the Climate Prediction Center's soil moisture model, USGS weekly streamflow percentiles, the standard precipitation index, the crop moisture index, and during the snow season basin snow water content, basin average precipitation, and the surface water supply index. Since this product considers streamflow conditions and reservoir water supply, and it allows manual adjustment; it is a good depiction of long-term drought impacts to the affected areas. The Drought Monitor uses four levels of drought classification (moderate, severe, extreme, and exceptional), and it notes the type of impact caused by the drought (agricultural and hydrologic).

Omaha District drought has steadily improved throughout the spring, summer, and fall. Above-normal rainfall and increased pool levels in Oahe Reservoir, Lake Sakakawea, and Ft. Peck reservoir have helped reduce the drought impacts. Portions of Nebraska, South Dakota, and Wyoming are currently classified as Abnormally Dry to Moderate Drought. North Dakota and Montana are currently classified as exhibiting Normal conditions. Currently, there are no portions of the basin classified with severe to exceptional drought.

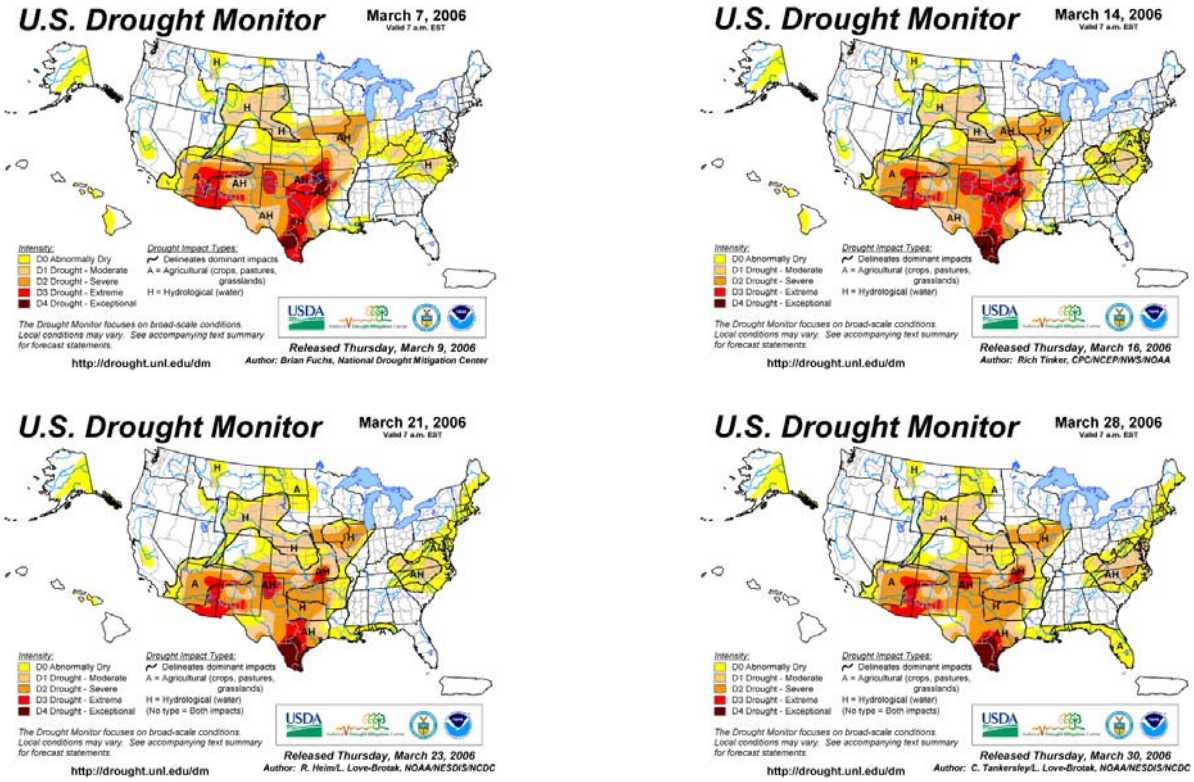


Figure 6 – U.S. Drought Monitor – March 7, 2006 through March 28, 2006
http://www.drought.unl.edu/dm/monitor.html

DROUGHT OUTLOOK

The basin drought outlook uses several expert products that indicate precipitation needs necessary to reduce the Palmer Drought to normal conditions, a one- and three-month climate outlook, and the impacts that future climate predictions could have on the current drought situation. The three-month Drought Outlook (Figure 7) indicates that the majority of the basin is returning to normal moisture conditions with the exception south-central and western Nebraska, portions of South Dakota, small areas of Montana, and the majority of Wyoming.

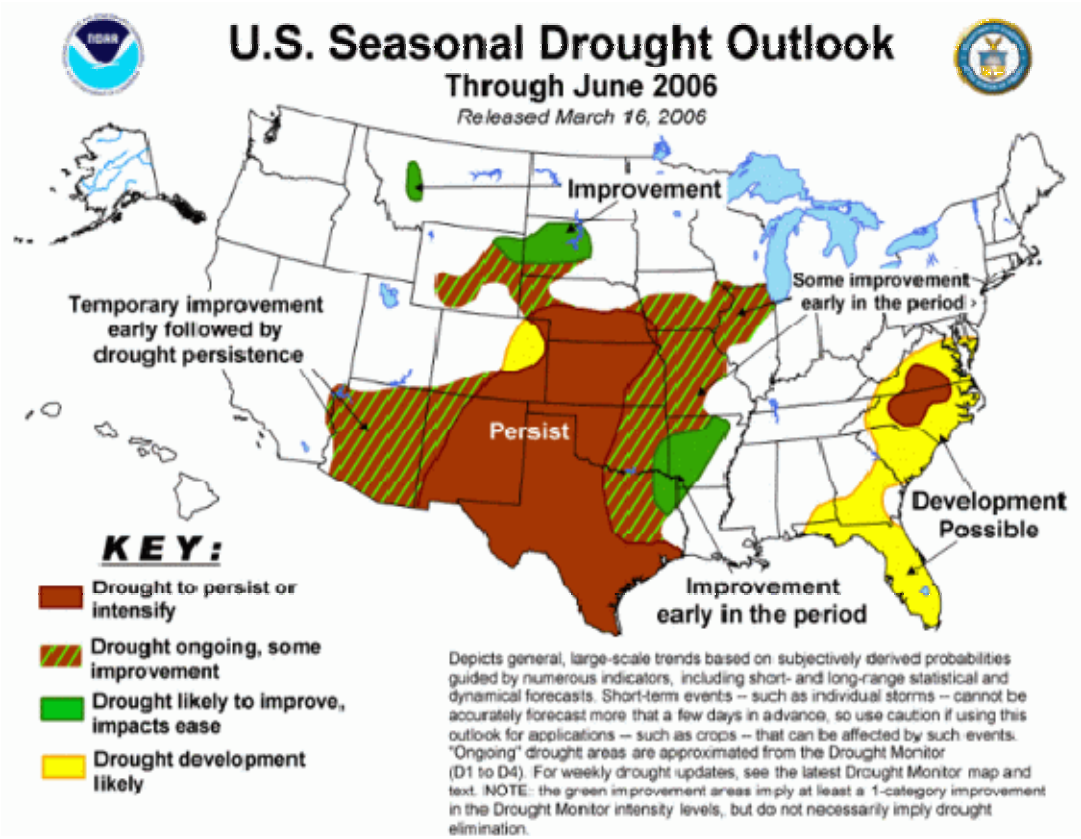


Figure 7 – Three-Month Seasonal Drought Outlook through June 2006
http://www.cpc.ncep.noaa.gov/products/expert_assessment/seasonal_drought.html

Weekly Precipitation Need

Figure 8 is the weekly precipitation needed to reduce the current Palmer Drought Severity Index value to -0.5 or near normal conditions.

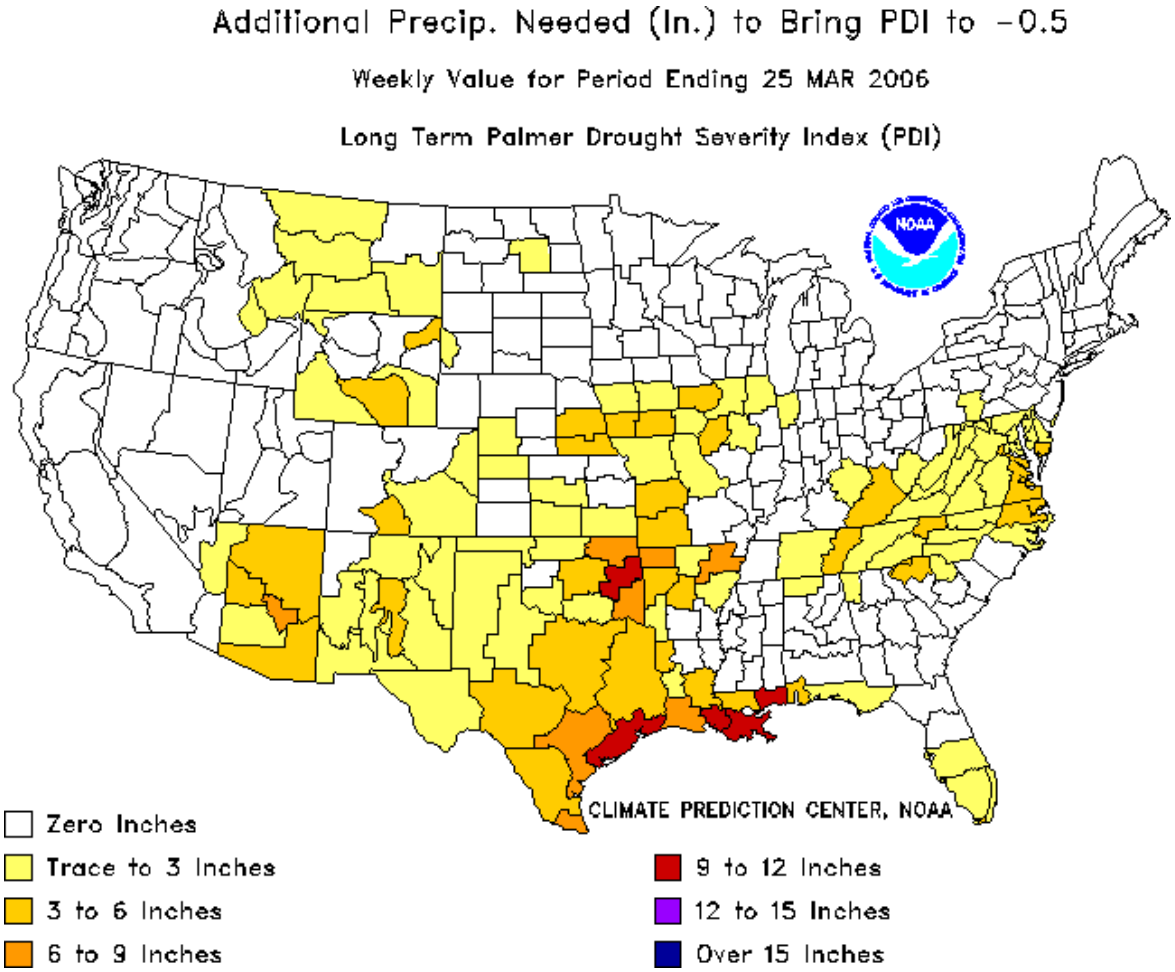


Figure 8 – Weekly Precipitation Need to Bring PDI to -0.5
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/addpcp.gif

In order to reach near normal Palmer Drought conditions, Montana would need approximately up to 3 inches of precipitation across the western portion of the state, the North Platte River basin in Wyoming would require up to 3 to 6 inches of precipitation while southeastern Nebraska would require up to 3 to 6 inches. Water supply deficits in large reservoirs, groundwater reserves, and possibly subsoil moisture reserves would receive limited benefit from the weekly Palmer precipitation needs. Mitigation of a multi-year drought would likely require multiple years of normal and above-normal water inflow conditions.

Mainstem Reservoir Information

The mainstem reservoir system is in far better condition when compared with conditions at the same time one year ago. In particular, the upper three reservoirs are at or above the elevation they were April 1, 2005. Fort Peck is approximately three feet higher, Garrison is approximately two feet higher and Oahe is approximately two feet higher. At this time, no municipal water intakes within the reservoirs appear to be in jeopardy.

Recent precipitation has contributed to the condition of the reservoirs. Continued moisture will further improve conditions throughout the basin. Generally, the basin appears to be in significantly better hydrologic condition than anticipated at the beginning of the water year.

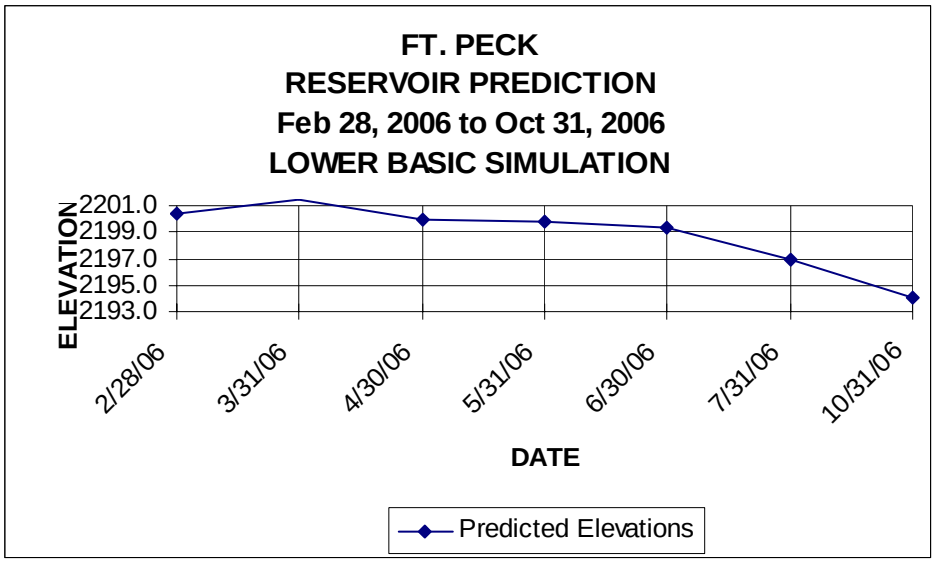
Fort Peck, Montana

Reservoir Elevation Overview

Lake Elevation 3/31/2005 (ft. msl)	Current Lake Elevation 3/31/2006 (ft. msl)	30-Day Projected Elevation* (4/30/2006) (ft. msl)	180-Day Projected Elevation* (10/31/2006) (ft. msl)
2198.6	2201.5	2200.0	2194.0

Comments:

1. Current reservoir elevation is 32.5-feet below the top of conservation pool (elevation 2234.0 ft. msl).
2. *Projections provided are based upon the Lower Basic Simulation prepared by the Reservoir Control Center.
3. Current elevation is 2.9-ft. higher than elevation on 3/31/2005 (2198.6).



Water Intake Overview

Intake	Comments
Hell Creek State Park	No issues. Well completed 22 NOV 2004

Access Overview

1. 8 ramps usable (Corps and State); 3 ramps unusable. No permanent ramps operational.
2. Remaining concessionaires marginal.

Noxious Weeds Overview

1. As the reservoir elevation dropped, the noxious weeds spread along the shoreline.
2. Main concern is Saltcedar, which thrives along the shoreline as the reservoir elevation declines.
3. Noxious weed control will again be addressed Spring 2006.

Cultural Resources Overview

1. No issues to date.

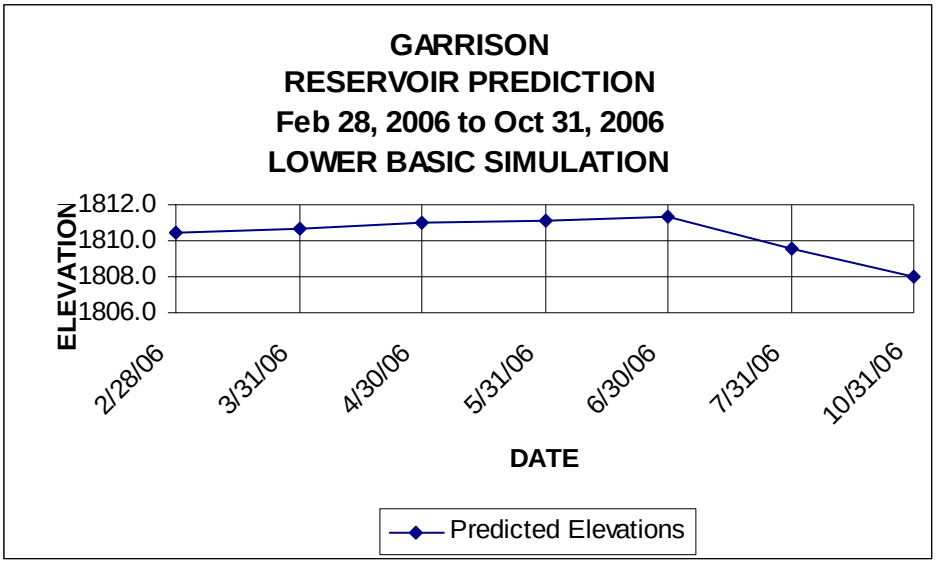
Garrison, North Dakota

Reservoir Elevation Overview

Lake Elevation 3/31/2005 (ft. msl)	Current Lake Elevation (3/31/2006) (ft. msl)	30-Day Projected Elevation* (4/30/2006) (ft. msl)	180-Day Projected Elevation* (10/31/2006) (ft. msl)
1808.7	1810.7	1811.0	1808.0

Comments:

1. Current reservoir elevation is 26.8-feet below the top of conservation pool (elevation 1837.5 ft. msl).
2. *Projections provided are based upon the Lower Basic Simulation prepared by the Reservoir Control Center.
3. Current reservoir elevation is 2.0 ft. higher than elevation on 2/28/05 (1808.3).



Water Intake Overview

Intake	Status	Current Reservoir Elev.	Top of Screen Elev.	Operational Concern Elev.	Shutdown Elev.		Population Supported	Contingency Plan? (Y/N)	Resp. Agency
					Summer	Winter			
Whiteshield	Operational	1810.7	1782.4	1801	1801	1801	720	N	TAT/BOR

Comments:

1. Top of Screen Elevation taken from survey completed by the Corps in 2005. The intake was extended and lowered 2-feet since the Corps' survey in 2005.

Future Plans:

1. Ft. Berthold Rural Water System secured $1.0 million funding through USDA Emergency Community Water Assistance Grant Program for improvements in 2006. Currently, FBRW is working on the appropriate paperwork and the design of the system improvements. The improvements are planned to include:
    a. Extending approximately 400 to 500 feet from the current intake screen with 8" to 12" casing pipe. The new intake screen elevation would be approximately 1780 (or lower).
    b. Estimated cost: $1.16 million.
    c. Estimated time of completion: Late 2006.

Intake	Status	Current Reservoir Elev.	Top of Screen Elev.	Operational Concern Elev.	Shutdown Elev.		Population Supported	Contingency Plan? (Y/N)	Resp. Agency
					Summer	Winter			
Twin Buttes	Operational	1810.7	1784.4	1805		1790	425	N	TAT/BOR

Comments:

1. Top of Screen Elevation taken from survey completed by the Corps in 2005.
2. In August, Ft. Berthold Rural Water System cleaned the "short tube" side of the existing intake structure and lowered the pump to a new elevation of approximately 1800. Both the "long tube" and "short tube" pumps should be at nearly equal elevations.
3. Erosion due to low reservoir levels have caused increased sediment in the intake piping. This has increased maintenance cost to remove the sediment and increased the cost of treating the water.

Future Plans:

1. Ft. Berthold Rural Water System has secured funding through the Indian Health Services, the Bureau of Reclamation, and the USDA Emergency Community Water Assistance Grant Program to improve the system in 2006. The FBRW is currently completing the necessary paperwork and working on the design for the improvements. The current plans are to:
    a. Install a new casing approximately 450-feet into the lake.
    b. Install a new 10" to 12" supply line, approximately 300- to 400-feet beyond the current location to approximate elevation 1780.0.
    c. Provide bank stabilization and erosion control over the new line.

Intake	Status	Current Reservoir Elev.	Top of Screen Elev.	Operational Concern Elev.	Shutdown Elev.		Population Supported	Contingency Plan? (Y/N)	Resp. Agency
					Summer	Winter			
Mandaree	Operational	1810.7	1786	1789.0	1787	1790	780	N	TAT/BOR

Comments:

1. The new intake screen is at elevation 1786.
2. Grant monies for the project were secured from USDA Emergency Community Water Assistance Grant Program and Indian Health Services.

Intake	Status	Current Reservoir Elev.	Top of Screen Elev.	Operational Concern Elev.	Shutdown Elev.		Population Supported	Contingency Plan? (Y/N)	Resp. Agency
					Summer	Winter			
Four Bears	Operational	1810.7	1789.9	1800.0		1794	900	N	TAT/BOR

Comments:

1. Top of Screen Elevation taken from survey completed by the Corps in 2005.
2. The screen has been checked by divers and it was confirmed that approximately 20-feet of water is over the intake.
3. Erosion due to low reservoir levels have caused increased sediment in the intake piping. This has increased maintenance cost to remove the sediment and increased the cost of treating the water.

Future Plans:

1. Ft. Berthold Rural Water System has secured funding through USDA Emergency Community Water Assistance Grant Program to improve the intake in 2006. FBRW is currently completing paperwork and working on the design for the following:
    a. Exploration and mapping of the intake area.
    b. Replacement/extension approximately 200- to 250-feet from the current intake screen with 8” to 12” casing pipe. The new intake screen would be at approximate elevation 1780 (or lower).
    c. Estimated cost: $942,500
    d. Estimated time of completion: 2006.

Intake	Status	Current Reservoir Elev.	Top of Screen Elev.	Operational Concern Elev.	Shutdown Elev.		Population Supported	Contingency Plan? (Y/N)	Resp. Agency
					Summer	Winter			
Parshall	Operable	1810.7	1803.6	1806.6	1797.5	1801.5	1000	N	Parshall

Comments:

1. Top of Screen Elevation taken from survey completed by the Corps in 2005.
2. The City had a telescoping riser attached to the intake by 30 July 2005. The riser extended the intake to within 3- to 4-feet of the water’s surface.
3. Require at least 3 feet of water over the intake for proper operation.
4. Water quality at current level is good following water treatment.

Future Plans:

1. Discussions have been held between Parshall and New Town regarding future water supply. No formal decisions have been reached.

Intake	Status	Current Reservoir Elev.	Top of Screen Elev.	Operational Concern Elev.	Shutdown Elev.		Population Supported	Contingency Plan? (Y/N)	Resp. Agency
					Summer	Winter			
Pick City	Operational	1810.7	1795	1800	1798	1800	200		Pick City

Comments:

1. Top of Screen Elevation taken from survey completed by the Corps in 2005.
2. At least 5-feet of water is necessary to operate this intake. If continued usage is planned, the intake will have to be lowered.

Future Plans:

1. Rural water is available to the City, however, they have chosen to continue using their intake until the water no longer meets State Health Standards or work is required on their intake.

Intake	Status	Current Reservoir Elev.	Top of Screen Elev.	Operational Concern Elev.	Shutdown Elev.		Population Supported	Contingency Plan? (Y/N)	Resp. Agency
					Summer	Winter			
Garrison	Operational	1810.7	1787.2	1805	1792	1792	1830	N	Garrison

Comments:

1. Top of Screen Elevation taken from survey completed by the Corps in 2005.
2. The City plans to extend the existing intake during the Fall of 2005.
3. The existing line has been exposed as water levels have dropped. A portion of the line was covered with soil and the pumps cycled last December (2004) to prevent freezing. Continuation of this practice is not a feasible alternative.
4. Directional boring will be used to extend the water line.

Access Overview

1. Project personnel would like to establish a plan for continuing boat ramp extensions, including expected costs for FY 06 budget considerations.
2. Lake Sakakawea State Park/Kit's Marina has been modified for low water operation by the vendor. The marina will be usable to approximate elevation 1802.
3. Ft. Stevenson State Park Marina design to be completed prior to Spring 2006.
4. A $900,000 Congressional add for boat ramp extensions was proposed by Senator Dorgan for FY 06. The add has been rejected at the Congressional level.

Updated 11/16/2005

Reservoir Elevation 3/31/06 – 1810.7

Location	Type	Top Elevation	Bottom Elevation	Comments	Managing Agency	Contact Person	Phone
Beaver Bay (low-water-COE)	poured concrete	1829	1808	**Usable**	Corps of Engineers	Linda Phelps	654-7411
Beulah Bay	poured concrete	1852.4	1799	**Usable**	Beulah Park Board	Greg Logan	870-5852
Charging Eagle Bay (2nd low water)	poured concrete, planks	1816	1806	**Unusable**	Three Affiliated Tribes	Jim Mossett	880-1203
Charging Eagle Bay (1st low water)	poured concrete	1835	1810.6	**Usable**	Three Affiliated Tribes	Jim Mossett	880-1203
Dakota Waters Resort (low-water)	poured concrete, planks	1853.1	1797	**Usable**	Beulah Park Board	Kelvin Heinsen	873-5800
Deepwater Creek (2nd low water)	poured concrete, planks	1818	1802	**Usable**	Corps of Engineers	Linda Phelps	654-7411
Deepwater Creek (1st low water)	poured concrete	1838	1809	**Usable**	Corps of Engineers	Linda Phelps	654-7411
Douglas Creek (low water)	poured concrete, planks	1828	1801	**Usable**	Corps of Engineers	Linda Phelps	654-7411
Fort Stevenson State Park (low water)	poured concrete	1851	1797	**Usable**	ND Parks & Rec	Dick Messerly	337-5576
Four Bears Park (south low water)	concrete planks	1824	1803	**Usable**	Three Affiliated Tribes	Alan Chase	627-4018
Garrison Creek Cabin Site	poured concrete	1849.2	1802	**Usable**	Garrison Cabin Assc.		
Government Bay (low water)	slide-in metal sections	1812	1803	**Unusable**	Corps of Engineers	Linda Phelps	654-7411
Government Bay (main ramp)	poured concrete	1857	1810	**Usable**	Corps of Engineers	Linda Phelps	654-7411
Hazen Bay (2nd low water)	poured concrete	1829	1810	**Usable**	Hazen Park Board	Hazen City Hall	748-2550
Indian Hills (3rd low water)	slide-in metal sections	1810	1801	**Unusable**	Parks & Rec/Tribes	Kelly Sorge	743-4122
Indian Hills (2nd low water)	concrete planks	1818.3	1807	**Usable**	Parks & Rec/Tribes	Kelly Sorge	743-4122
Indian Hills (1st low water)	concrete planks	1826.4	1811.8	**Usable**	Parks & Rec/Tribes	Kelly Sorge	743-4122
McKenzie Bay (east ramp)	poured concrete	1855	1796	**Usable**	McKenzie Marine Club	Rhonda Logan	579-3366

Location	Type	Top Elevation	Bottom Elevation	Comments	Managing Agency	Contact Person	Phone
Parshall Bay (3rd low-water)	slide-in metal sections	1818.4	1808.5	**Usable**	Mountrail County Park Board		628-2145
Pouch Point (3rd low-water)	slide-in metal sections	1820	1809	**Usable**	Three Affiliated Tribes	Royce Wolf	627-3553
Pouch Point (2nd low-water)	poured concrete	1829	1813	**Usable**	Three Affiliated Tribes	Royce Wolf	627-3553
Reunion Bay (2nd low water)	concrete planks	1825.8	1808	**Usable**	Corps of Engineers	Linda Phelps	654-7411
Sakakawea State Park (main)	poured concrete	1850	1800	**Usable**	ND Parks & Rec	John Tunge	487-3315
Sanish Bay (Aftem) (low water)	poured concrete	1831.1	1807.4	**Usable**	Aftem Lake Development	Gerald Aftem	852-2779
Skunk Creek Recreation Area (main)	poured concrete	1850	1806.5	**Usable**	Three Affiliated Tribes	Ken Danks	290-2841
Sportsmen's Centennial Park	poured concrete	1831.2	1808.5	**Usable**	McLean County	Marlin Hvinden	462-8541
Van Hook (Gull Island south low-water)	metal bridge deck sections	1823	1805	**Usable**	Mountrail County Park Board	Clarence Weltz	627-3377
Van Hook (Gull Island north low-water)	metal bridge deck sections	1823.1	1805	**Usable**	Mountrail County Park Board	Clarence Weltz	627-3377
Van Hook (lst low water)	poured concrete	1822	1807	**Usable**	Mountrail County Park Board	Clarence Weltz	627-3377
White Earth Bay (low-water)	concrete plank & PSP	1833	1801	**Usable**	Mountrail County Park Board	Greg Gunderson	755-3277
Wolf Creek Recreation Area (2nd low water)	concrete planks & metal sec	1830	1802.5	**Usable**	Corps of Engineers	Linda Phelps	654-7411

Noxious Weeds Overview

1. Funding for Noxious Weed Control included in FY 06 O&M budget. Project personnel will continue efforts beginning in the Spring of 2006.

Cultural Resources Overview

1. Project personnel continue to monitor the shoreline for the protection of cultural resources. As the reservoir elevation falls, more opportunities are uncovered for looters, which collect artifacts and sell them on the open market.

Other Areas of Interest/Concern

1. Garrison National Fish Hatchery – Three issues exist and are of concern to the State of North Dakota and the U.S. Fish and Wildlife Service.
    a. Addition of a fifth boiler and necessary power for operation.
    b. Ability to fill 40 rearing ponds.
    c. Adequacy of the existing 20-inch water supply line from the penstocks.
2. Fact sheets for the hatchery issues exist. OP-TM is investigating a design for additional power requirements to the hatchery. An MOU may need to be set up to address future operating needs and requirements.
3. Garrison Cold Water Fishery – The modification to the trashracks of intakes 2 and 3, was completed 22 July 2005. In general, the modified units are operating as predicted, and are considered to be a success. The modifications were kept in place throughout the winter period, as the cost to remove and replace is comparable to lost power generation costs. The plates will be inspected in the spring with an underwater camera to ensure structural adequacy. A conference call with the State of North Dakota, FWS, and the Corps was held on February 23, 2006 to initiate the preparation of an evaluation report to summarize the effectiveness of the trashrack modification effort in 2005. This report will describe procedures used and identify positive or negative impacts to the cold water fishery, downstream Missouri River, and other water users. The report will be finalized near the end of May 2006. Throughout 2006, lessons learned in the 2005 evaluation report will be implemented to increase future effectiveness of the system.

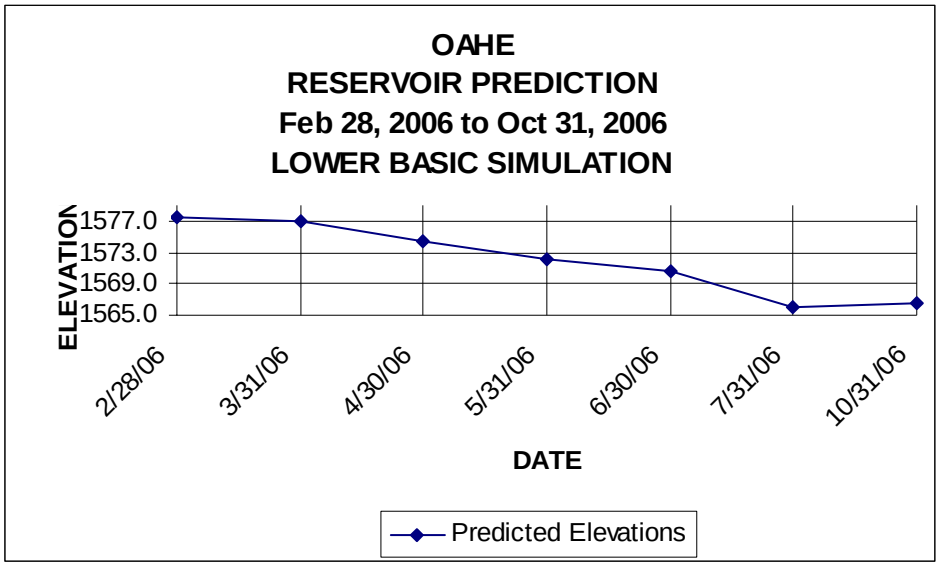
Oahe, South Dakota

Reservoir Elevation Overview

Lake Elevation 3/31/2005 (ft. msl)	Current Lake Elevation (3/31/2006) (ft. msl)	30-Day Projected Elevation* (4/30/2006) (ft. msl)	180-Day Projected Elevation* (10/31/2006) (ft. msl)
1574.6	1576.7	1574.3	1566.5

Comments:

1. Current reservoir elevation is 30.8-feet below the top of conservation pool (elevation 1607.5 ft. msl).
2. *Projections provided are based upon the Lower Basic Simulation prepared by the Reservoir Control Center.



Water Intake Overview

Intake	Status	Current Reservoir Elev.	Top of Screen Elev.	Operational Concern Elev.	Shutdown Elev.		Population Supported	Contingency Plan? (Y/N)	Resp. Agency
					Summer	Winter			
Ft. Yates	Operational	1576.7	1571.2	1573	1572.2	1575.2	3,400	Y	SRST/BOR

Comments:

1. Sediment to be removed from the intake sump during the week of 12 December 2005.
2. Top of Screen Elevation taken from survey completed by the Corps in 2005.
3. A backup well has been drilled and tested.
4. A Contingency Action Plan has been completed by the Corps.
5. A Table Top Exercise for the Contingency Action Plan, coordinated by the State of North Dakota, was held on 31 August 2005. The exercise went well, positive comments were received by the participants. Minor updates to the plan will be incorporated, as discussed during the exercise.

Future Plans:

1. Connection of new well to existing water distribution system.
2. The intake at Fort Yates remains in a river condition and may continue to have sedimentation problems as long as Oahe remains below elevation 1580. Sediment levels in the sump are measured weekly and the river channel is monitored.
3. Contingency plans are in place and have been exercised.

Intake	Status	Current Reservoir Elev.	Top of Screen Elev.	Operational Concern Elev.	Shutdown Elev.		Population Supported	Contingency Plan? (Y/N)	Resp. Agency
					Summer	Winter			
Wakpala	Operational	1576.7	1563	1563	1566	1569	>500	N	SRST/BOR

Comments:

1. Top of Screen Elevation taken from survey completed by the Corps in 2005, a new low profile screen was installed lowering the top of the screen elevation to 1563.

2. With the Corps of Engineers July reservoir projections for Oahe, the Wakpala intake will remain operational through the winter of 2005 with all reservoir projections over 1570.

3. Contingency plans are being drafted to respond to an intake failure. Initial response to an intake failure at Wakpala would be hauling water from the city of Mobridge to the treatment plant to be distributed using the existing transmission lines.

Intake	Status	Current Reservoir Elev.	Top of Screen Elev.	Operational Concern Elev.	Shutdown Elev.		Population Supported	Contingency Plan? (Y/N)	Resp. Agency
					Summer	Winter			
Mni Wasté	Operational	1576.7	1555.7	1580	1561.9	1560.4	14,000	Y(DRAFT)	CRST

Comments:

1. Top of Screen Elevation taken from survey completed by the Corps in 2005.
2. "Option 2", Phase 1 – Design, moving forward.
3. Trigger Points for the implementation of construction are being closely monitored.

Access Overview

1. The State of South Dakota is responsible for maintaining recreational areas and access to the reservoir in South Dakota. The Oahe Project maintains the access in North Dakota.

2. The Oahe Project worked on two ramps in the Fall of 2005 in order to improve access for fall fishing. Beaver Bay north low water and Hazelton.

3. Ramps on Oahe Project in North Dakota

AREA	Status
Sibley Park	Usable
Little Heart Bottoms	Usable
Kimball (Desert)	Usable
Graner's Bottoms	Usable
Maclean Bottoms	Usable
Hazelton	Usable
Ft. Rice	Usable
North Beaver Bay	Usable
Walker Bottoms	Usable
Jennerville (Rivery)	Usable
Fort Yates	Unusable
Cattail Bay	Unusable
Langeliers Bay	Unusable
Beaver Creek	Unusable
State Line	Unusable

http://gf.nd.gov/fishing/mo-riv-system-boatramps-status.html.

Noxious Weeds Overview

1. Two Contracts were issued in the fall of 2005. The contractors, and chemical regime are very effective and efficient during this time of year due to foliage color and chemical application method.

2. The Oahe Project has a $250,000 budget for salt cedar and other noxious weed control for FY 06.

Cultural Resources Overview

1. Project personnel continue to monitor the shoreline for the protection of cultural resources. As the reservoir elevation falls, more opportunities are uncovered for looters, which collect artifacts and sell them on the open market.

Mainstem Reservoir Information, Weekly Elevation Comparison

6 Mar. 2006	Project Information		Reservoir Elevation			Reservoir Storage		
Project	Multi-Purpose Pool Elev.	Flood Control Pool Elev.	Current Elevation (3/6/06)	Previous Elevation (2/27/06)	Change	Current Storage (MAC-FT) (3/6/06)	Previous Storage (MAC-FT) (2/27/05)	Change (MAC-FT)
Ft. Peck, MT	2160 - 2246	2246 – 2250	2200.6	2200.3	0.3	9.077	9.038	0.039
Garrison, ND	1775 – 1850	1850 – 1854	1810.4	1810.6	-0.2	10.997	11.066	-0.069
Oahe, SD	1540 - 1617	1617 – 1620	1577.5	1577.7	-0.2	11.190	11.199	-0.009
Big Bend, SD	1415 – 1422	1422 – 1423	1420.8	1420.6	0.2	1.671	1.661	0.010
Ft. Randall, SD	1320 – 1365	1365 – 1375	1349.9	1348.1	1.8	3.110	2.982	0.128
Gavins Point, SD	1204.5 - 1208	1208 - 1210	1206.5	1206.6	-0.1	0.369	0.373	-0.004

13 Mar. 2006	Project Information		Reservoir Elevation			Reservoir Storage		
Project	Multi-Purpose Pool Elev.	Flood Control Pool Elev.	Current Elevation (3/13/06)	Previous Elevation (3/6/06)	Change	Current Storage (MAC-FT) (3/13/06)	Previous Storage (MAC-FT) (3/6/06)	Change (MAC-FT)
Ft. Peck, MT	2160 - 2246	2246 – 2250	2200.8	2200.6	0.2	9.112	9.077	0.035
Garrison, ND	1775 – 1850	1850 – 1854	1810.5	1810.4	0.1	11.012	10.997	0.015
Oahe, SD	1540 - 1617	1617 – 1620	1577.6	1577.5	0.1	11.153	11.190	-0.037
Big Bend, SD	1415 – 1422	1422 – 1423	1421.1	1420.8	0.3	1.677	1.671	0.006
Ft. Randall, SD	1320 – 1365	1365 – 1375	1352.4	1349.9	2.5	3.303	3.110	0.193
Gavins Point, SD	1204.5 - 1208	1208 - 1210	1205.9	1206.5	-0.6	0.357	0.369	-0.012

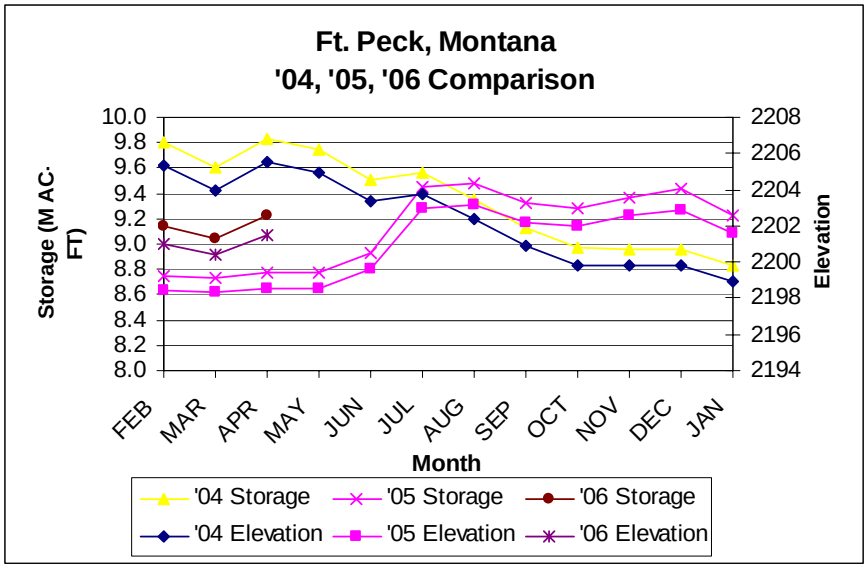
20 Mar. 2006	Project Information		Reservoir Elevation			Reservoir Storage		
Project	Multi-Purpose Pool Elev.	Flood Control Pool Elev.	Current Elevation (3/20/06)	Previous Elevation (3/13/06)	Change	Current Storage (MAC-FT) (3/20/06)	Previous Storage (MAC-FT) (3/13/06)	Change (MAC-FT)
Ft. Peck, MT	2160 - 2246	2246 – 2250	2201.1	2200.8	0.3	9.152	9.112	0.040
Garrison, ND	1775 – 1850	1850 – 1854	1810.4	1810.5	-0.1	11.018	11.012	0.006
Oahe, SD	1540 - 1617	1617 – 1620	1577.1	1577.6	-0.5	11.076	11.153	-0.077
Big Bend, SD	1415 – 1422	1422 – 1423	1420.7	1421.1	-0.4	1.666	1.677	-0.011
Ft. Randall, SD	1320 – 1365	1365 – 1375	1354.1	1352.4	1.7	3.458	3.303	0.155
Gavins Point, SD	1204.5 - 1208	1208 - 1210	1206.0	1205.9	0.1	0.357	0.357	0

27 Mar. 2006	Project Information		Reservoir Elevation			Reservoir Storage		
Project	Multi-Purpose Pool Elev.	Flood Control Pool Elev.	Current Elevation (3/27/06)	Previous Elevation (3/20/06)	Change	Current Storage (MAC-FT) (3/27/06)	Previous Storage (MAC-FT) (3/20/06)	Change (MAC-FT)
Ft. Peck, MT	2160 - 2246	2246 – 2250	2201.4	2201.1	0.3	9.194	9.152	0.042
Garrison, ND	1775 – 1850	1850 – 1854	1810.4	1810.4	0.0	11.018	11.018	0.0
Oahe, SD	1540 - 1617	1617 – 1620	1576.8	1577.1	-0.3	11.016	11.076	-0.060
Big Bend, SD	1415 – 1422	1422 – 1423	1420.6	1420.7	-0.1	1.658	1.666	-0.008
Ft. Randall, SD	1320 – 1365	1365 – 1375	1354.8	1354.1	0.7	3.524	3.458	0.066
Gavins Point, SD	1204.5 - 1208	1208 - 1210	1206.0	1206.0	0.0	0.363	0.357	0.006

Mainstem Reservoir Storage Comparison – Water Year 2004 vs. Water Year 2005

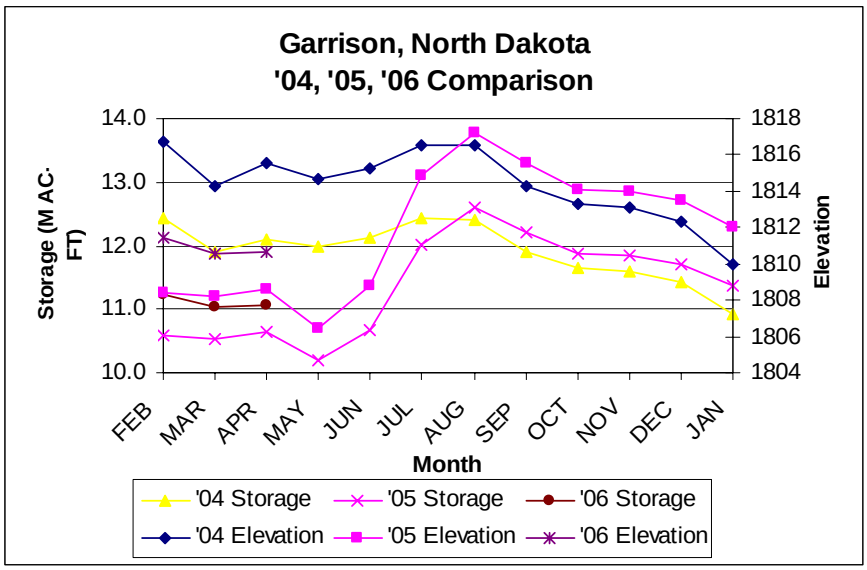
Fort Peck, Montana

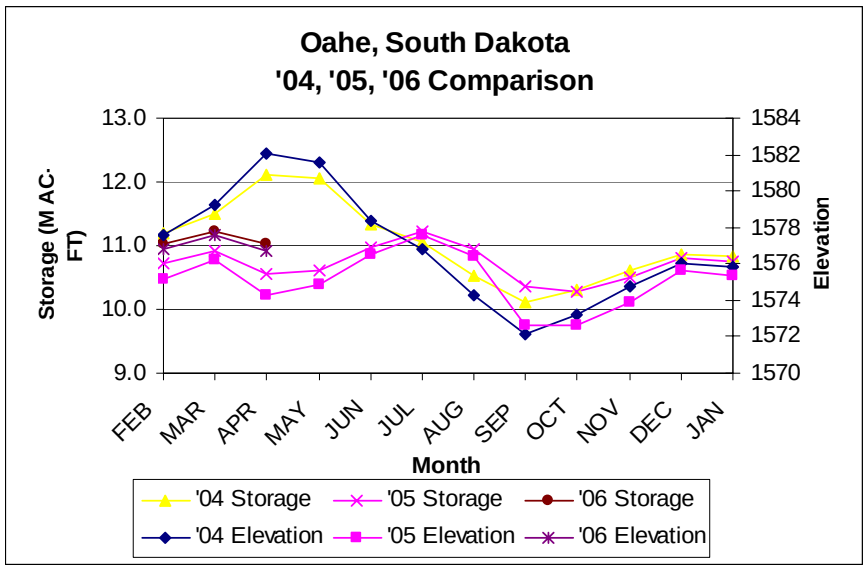
Water Year 2004 (FEB 2004 – JAN 2005)			Water Year 2005 (FEB 2005 – JAN 2006)			Water Year 2006 (FEB 2006 – JAN 2007)		
Date	Elevation	Storage (MAC-Ft.)	Date	Elevation	Storage (MAC-Ft.)	Date	Elevation	Storage (MAC-Ft.)
FEB	2205.3	9.806	2/1/2005	2198.4	8.749	2/1/2006	2201.0	9.134
MAR	2204	9.603	3/1/2005	2198.3	8.732	3/1/2006	2200.4	9.048
APR	2205.5	9.837	4/1/2005	2198.5	8.773	4/1/2006	2201.5	9.222
MAY	2204.9	9.740	5/1/2005	2198.5	8.773	5/1/2006		
JUN	2203.4	9.507	6/1/2005	2199.6	8.935	6/1/2006		
JUL	2203.8	9.565	7/1/2005	2203.0	9.448	7/1/2006		
AUG	2202.4	9.357	8/1/2005	2203.2	9.472	8/1/2006		
SEP	2200.9	9.121	9/1/2005	2202.2	9.325	9/1/2006		
OCT	2199.8	8.969	10/1/2005	2202.0	9.286	10/1/2006		
NOV	2199.8	8.963	11/1/2005	2202.6	9.371	11/1/2006		
DEC	2199.8	8.961	12/1/2005	2202.9	9.432	12/1/2006		
JAN	2198.9	8.829	1/1/2006	2201.5	9.222	1/1/2007		



Garrison, ND

Water Year 2004 (FEB 2004 – JAN 2005)			Water Year 2005 (FEB 2005 – JAN 2006)			Water Year 2006 (FEB 2006 – JAN 2007)		
Date	Elevation	Storage (MAC-Ft.)	Date	Elevation	Storage (MAC-Ft.)	Date	Elevation	Storage (MAC-Ft.)
FEB	1816.7	12.446	2/1/2005	1808.4	10.574	2/1/2006	1811.4	11.230
MAR	1814.3	11.891	3/1/2005	1808.2	10.537	3/1/2006	1810.6	11.040
APR	1815.6	12.110	4/1/2005	1808.65	10.632	4/1/2006	1810.7	11.076
MAY	1814.7	11.989	5/1/2005	1806.47	10.189	5/1/2006		
JUN	1815.3	12.121	6/1/2005	1808.8	10.665	6/1/2006		
JUL	1816.5	12.426	7/1/2005	1814.9	12.026	7/1/2006		
AUG	1816.5	12.401	8/1/2005	1817.17	12.591	8/1/2006		
SEP	1814.3	11.914	9/1/2005	1815.56	12.216	9/1/2006		
OCT	1813.3	11.645	10/1/2005	1814.11	11.861	10/1/2006		
NOV	1813.1	11.589	11/1/2005	1814.00	11.837	11/1/2006		
DEC	1812.3	11.422	12/1/2005	1813.50	11.707	12/1/2006		
JAN	1810	10.936	1/1/2006	1812.0	11.371	1/1/2007		



Oahe, SD

Water Year 2004 (FEB 2004 – JAN 2005)			Water Year 2005 (FEB 2005 – JAN 2006)			Water Year 2006 (FEB 2006 – JAN 2007)		
Date	Elevation	Storage (MAC-Ft.)	Date	Elevation	Storage (MAC-Ft.)	Date	Elevation	Storage (MAC-Ft.)
FEB	1577.6	11.204	2/1/2005	1575.2	10.715	2/1/2006	1576.8	11.037
MAR	1579.2	11.504	3/1/2005	1576.2	10.924	3/1/2006	1577.6	11.209
APR	1582.1	12.110	4/1/2005	1574.29	10.568	4/1/2006	1576.7	11.024
MAY	1581.6	12.056	5/1/2005	1574.82	10.608	5/1/2006		
JUN	1578.4	11.338	6/1/2005	1576.47	10.980	6/1/2006		
JUL	1576.8	11.045	7/1/2005	1577.6	11.214	7/1/2006		
AUG	1574.3	10.540	8/1/2005	1576.38	10.958	8/1/2006		
SEP	1572.1	10.112	9/1/2005	1572.64	10.363	9/1/2006		
OCT	1573.2	10.316	10/1/2005	1572.63	10.267	10/1/2006		
NOV	1574.8	10.608	11/1/2005	1573.90	10.501	11/1/2006		
DEC	1576	10.866	12/1/2005	1575.6	10.814	12/1/2006		
JAN	1575.8	10.824	1/1/2006	1575.6	10.778	1/1/2007