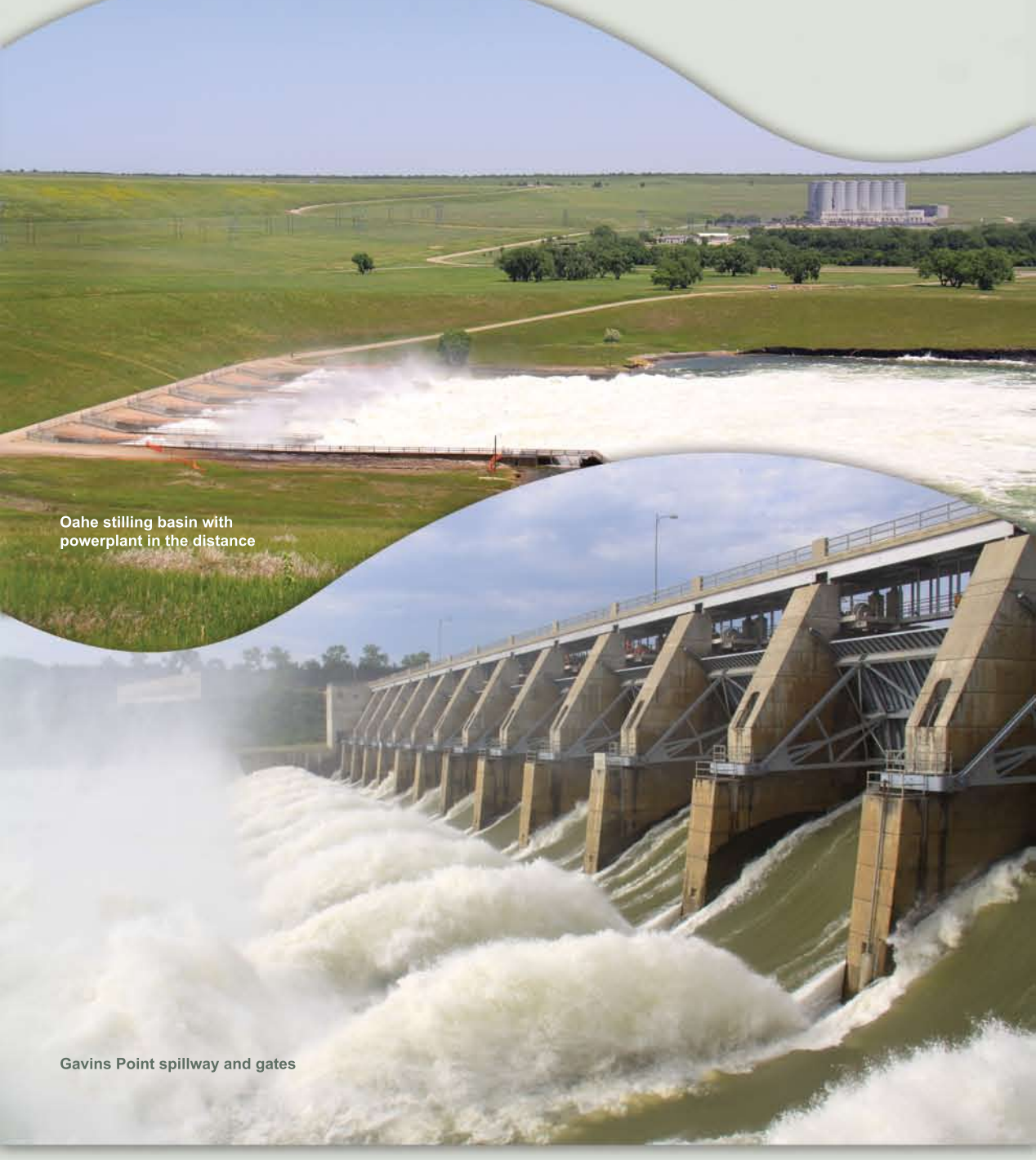
US Army Corps of Engineers

Missouri River Basin Water Management



Oahe stilling basin with powerplant in the distance

Gavins Point spillway and gates

US Army Corps of Engineers
BUILDING STRONG

Missouri River
Mainstem Reservoir System

Missouri River Basin

Engineering Summary

	Fort Peck	Garrison	Oahe	Big Bend	Fort Randall	Gavins Point
Construction Started	1933	1946	1948	1959	1946	1952
Operation Began	1940	1955	1962	1964	1953	1955
Length of Full Reservoir	134 miles	178 miles	231 miles	80 miles	107 miles	25 miles
Dam Embankment Length	21,026 feet	11,300 feet	9,300 feet	10,570 feet	10,700 feet	8,700 feet
Top of Dam (above sea level)	2280.5 feet	1875.0 feet	1660.0 feet	1440.0 feet	1395.0 feet	1234.0 feet
Spillway Discharge Capacity at Max Operating Pool	230,000 cfs	660,000 cfs	80,000 cfs	270,000 cfs	508,000 cfs	345,000 cfs
Estimated Annual Sediment Inflow	17,700 ac-ft	25,900 ac-ft	19,800 ac-ft	5,300 ac-ft	18,400 ac-ft	2,600 ac-ft
Years to Fill Sediment to Max Operating Pool	1030	920	1170	430	250	180
Number of Outlet Tunnels Total Capacity	2 45,000 cfs	3 98,000 cfs	6 110,000 cfs	none	4 128,000 cfs	none
Number of Hydropower Units Total Capacity	5 16,000 cfs	5 41,000 cfs	7 54,000 cfs	8 103,000 cfs	8 44,500 cfs	3 36,000 cfs
Powerplant Capacity	185,250 kW	583,300 kW	786,030 kW	494,320 kW	320,000 kW	132,300 kW

Big Bend spillway and gates

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Missouri River
Mainstem Reservoir System

Mainstem System

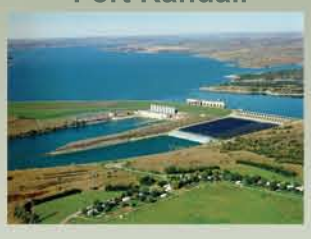
Fort Peck

Garrison

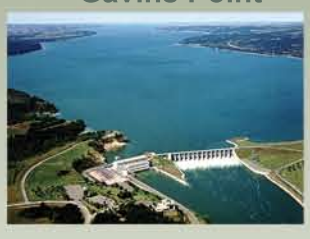
Oahe

Big Bend

Fort Randall



Gavins Point

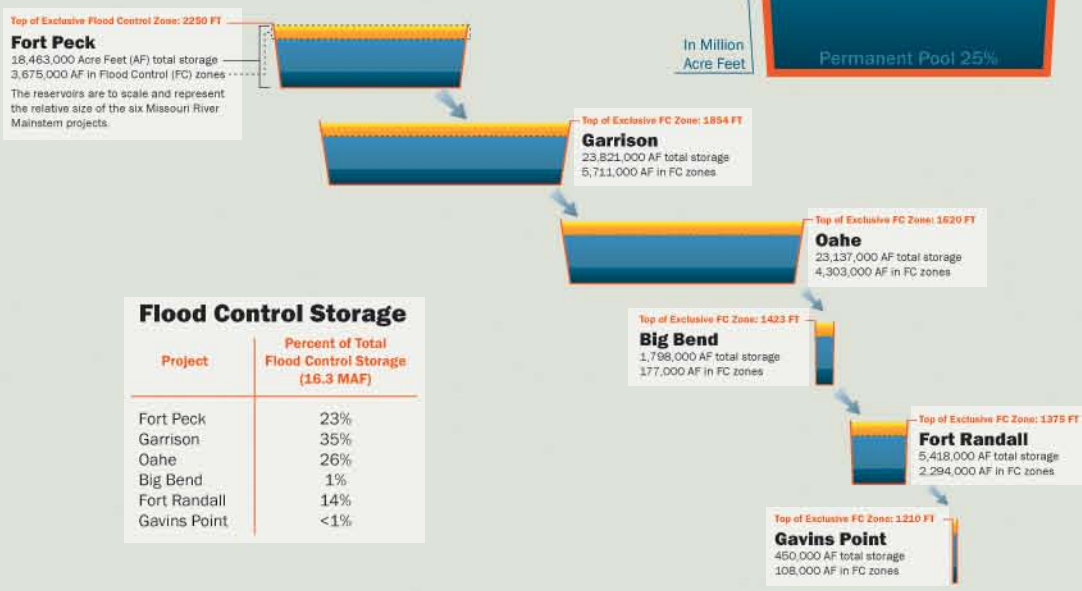


How the Dams Work Together

The six Mainstem dams on the Missouri River work together as a system to store runoff from the hundreds of tributaries that flow into the Missouri River, from mountain and plains snowmelt and rainfall. The Mainstem dams vary greatly in their storage capacity. Below you can see the dams' sizes and locations relative to one another.

The six Mainstem dams, working together as a system, are Congressionally authorized to store and release water for eight purposes: flood control; navigation; hydropower generation; irrigation; water supply; water quality control; recreation; and fish and wildlife including threatened and endangered species. Storage in the reservoir system is divided into four operating zones. As a whole system, the six Mainstem dams can hold 73.1 million acre feet of water.

To prepare for the next runoff season, the Corps must evacuate water from the flood control zones of all six dams by the start of the next runoff season. This means that water stored in Fort Peck reservoir will eventually travel the length of the system, be released from Gavins Point reservoir, and continue to St. Louis where the Missouri River meets the Mississippi River.



The reservoirs are to scale and represent the relative size of the six Missouri River Mainstem projects.

Flood Control Storage

Project	Percent of Total Flood Control Storage (16.3 MAF)
Fort Peck	23%
Garrison	35%
Oahe	26%
Big Bend	1%
Fort Randall	14%
Gavins Point	<1%

System Zones & Allocations of the Total Storage Capacity

Fort Peck spillway and stilling basin with gates in the distance

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Missouri River
Mainstem Reservoir System

Forecasting Runoff

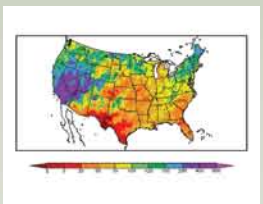
Types of Missouri River Basin Runoff: What Adds Water to the System?

Plains Snowmelt
(March to April)

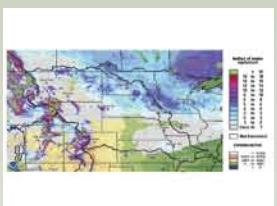
Mountain Snowmelt
(May to July)

Rainfall
(March to October)

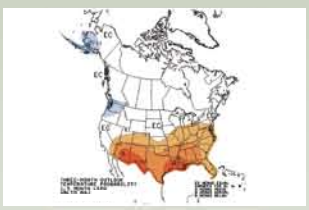
Observed Precipitation
Percent of Normal



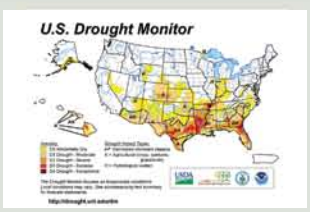
Plains Snowpack
Water Content



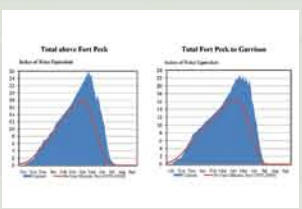
Temperature Forecast
Three-Month Outlook



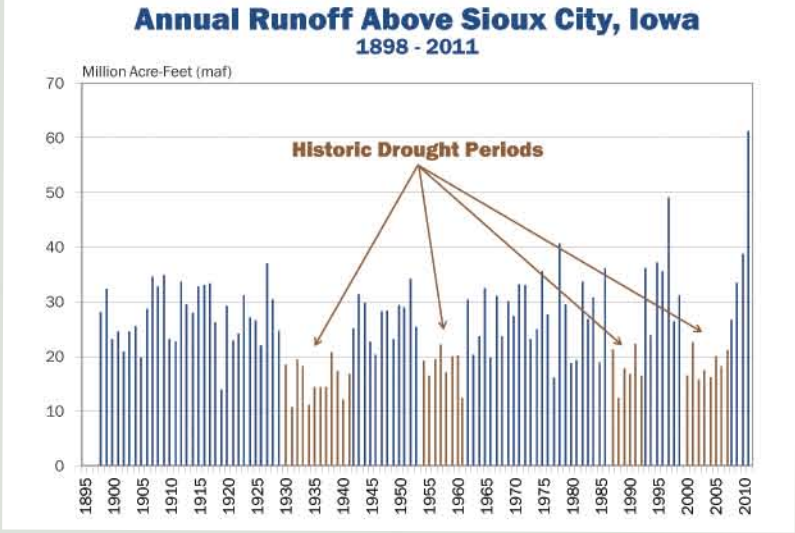
Soil/Basin Conditions
U.S. Drought Monitor



Mountain Snowpack
Water Content



Precipitation Forecast
Three-Month Outlook



Garrison powerplant

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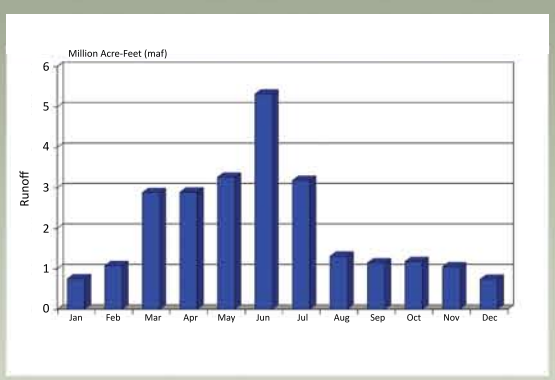
Missouri River
Mainstem Reservoir System

Determining Releases

Runoff Forecast

Monthly Runoff Forecast Above Sioux City, Iowa

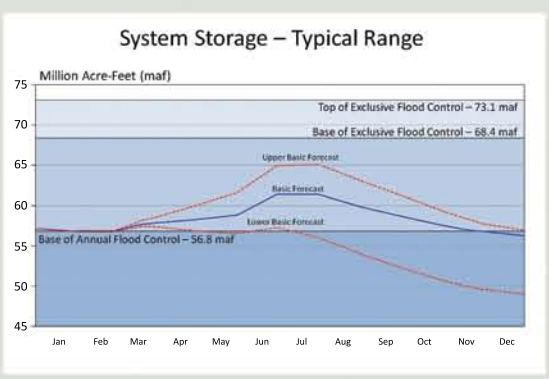


The Corps uses information from observed precipitation, soil/basin conditions, plains snowpack, mountain snowpack and the long-term climate forecasts to develop a monthly runoff forecast.

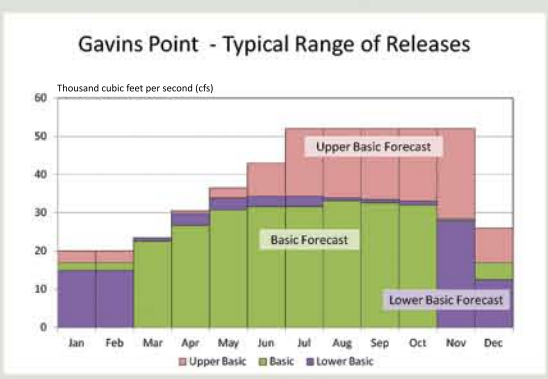
Reservoir Computer Model

After developing the monthly reach-by-reach forecast for the basin, the Corps enters this information into a reservoir model to develop the reach-by-reach expected storage and reservoir release levels.

Storage and Releases



The Corps develops a basic forecast which assumes expected precipitation (snow and rain). The Corps also develops two contingency forecasts that set a plan for reservoir storage and release rates in the event of above and below expected precipitation.



The graphic at left shows the typical range of actual and projected storage for an average year. The graphic above shows typical projected Gavins Point releases.

Fort Randall powerplant