

# 2011 FLOODWATER EVACUATION PLAN

**OPERATION MIGHTY MO**

**MISSOURI RIVER BASIN  
FLOOD OF 2011**

**BG JOHN R. MCMAHON**

29 JUL 2011



US Army Corps of Engineers  
**BUILDING STRONG**

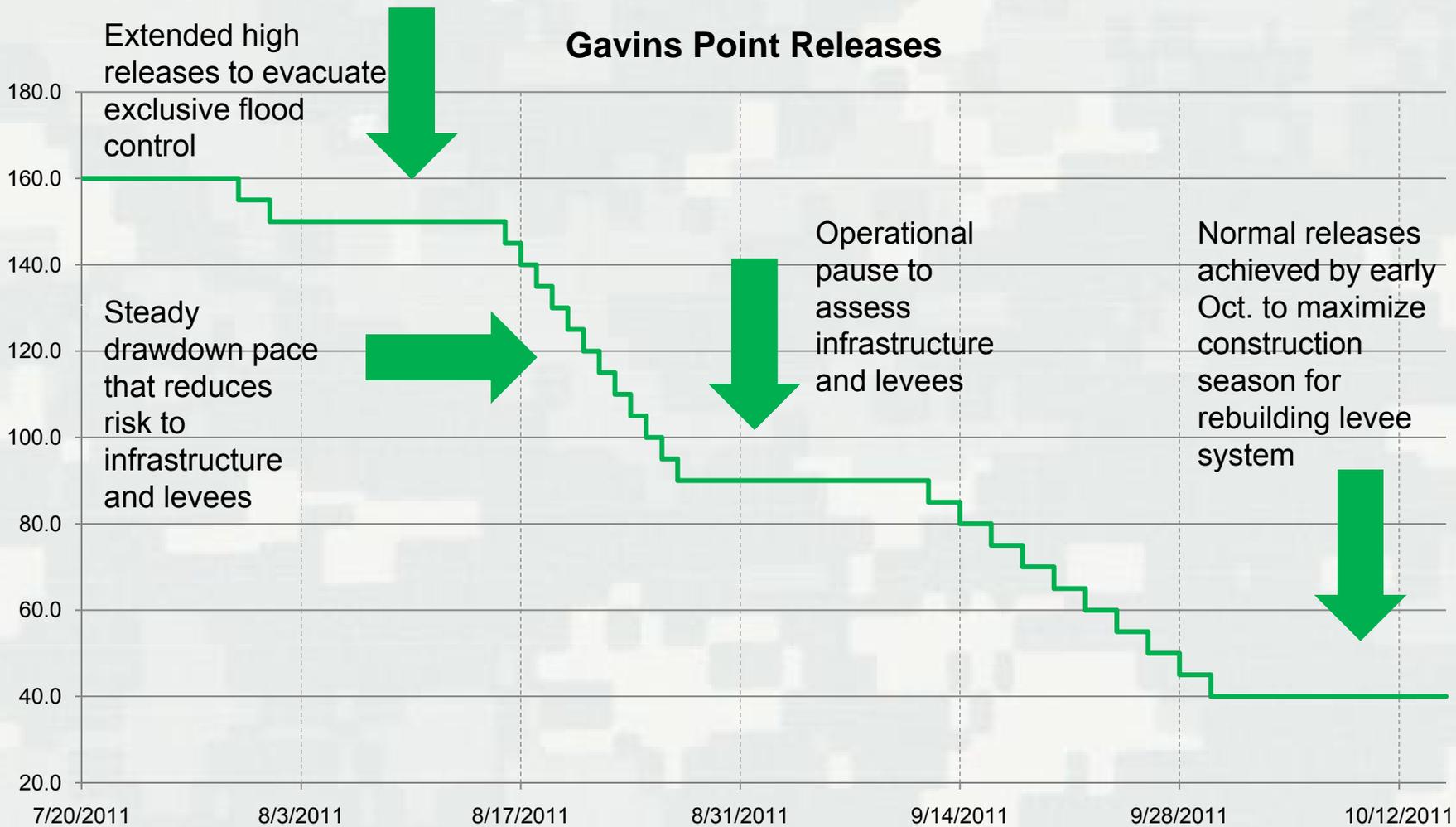


# End State

## (How best to address risks)

- **Desired end state:** Restore the System infrastructure and levees to pre-2011 event condition and ensure adequate storage for the 2012 runoff season—be READY for 2012
- Determine the best strategy to evacuate remaining 2011 runoff—evaluate several options
- Assess risks related to achieving end state via multiple evacuation strategies weighing each risk accordingly
- Evacuate the water out of the system as fast as possible in a responsible way to enable:
  - ▶ Return of citizens to homes, farms and businesses to begin recovery
  - ▶ Inspection, assessment and repair of infrastructure and levees
  - ▶ Engender public confidence with Governor and Congressional support
- Reduce known risks where we can and anticipate other risks, both known and unknown

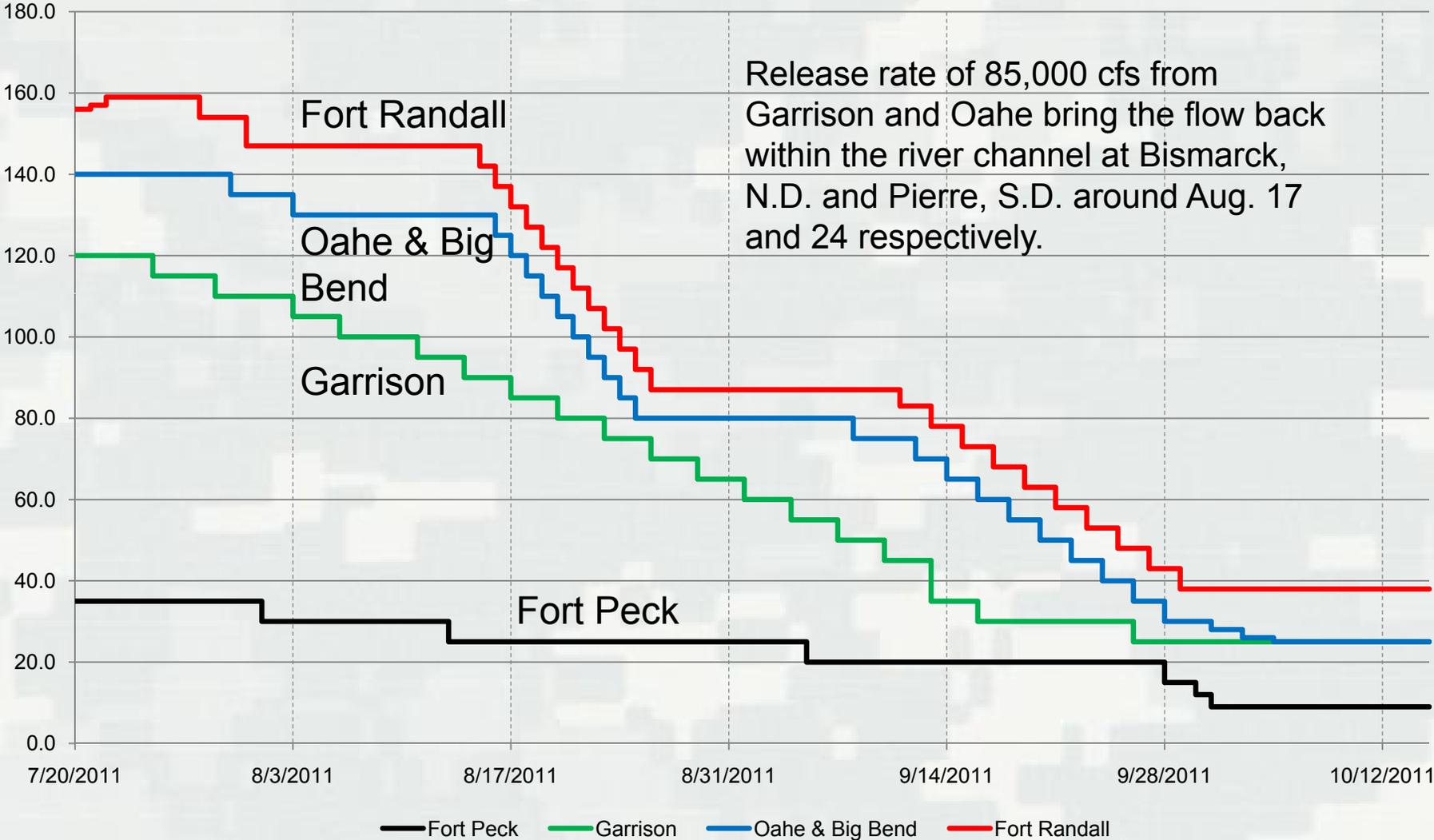
# Drawdown Strategy



All dates provided above are best approximations, based on current forecast conditions and the best available information at the time. Adjustments to the release schedule may be necessary if conditions change.

# Drawdown Strategy

Fort Peck, Garrison, Oahe/Big Bend, and Fort Randall Releases



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# Risk Assessments

- Key considerations:
  - ▶ Flood plain drainage and impacts
  - ▶ Condition of levees
  - ▶ Condition of dams
  - ▶ Other infrastructure
  - ▶ Weather forecast
  - ▶ Amount of flood control storage needed
  - ▶ Funding available
  - ▶ Project Information Reports (PIRs) and Designs
  - ▶ Contractor capability
  - ▶ Winter construction season constraints
  - ▶ Impacts to Kansas Reservoirs

# Key Engineering Considerations

- 
- Evacuate exclusive flood control zones of all reservoirs as soon as possible—gain back our flexibility.
  - Ensure fall releases are low enough to facilitate damage assessment and repair of infrastructure and levees (<40k cfs).
  - Ensure winter releases are low enough to permit winter construction and minimize the risk of ice jam flooding (<20k cfs).
  - Ensure rates of change in releases and reservoir levels are acceptable.
  - Consider releases that take water off critical infrastructure.
  - Consider releases that avoid continued use of various project features such as spillways and outlet tunnels.
  - Consider releases that allow temporary measures to be removed.

# Why this strategy?

## Downstream Considerations

- Pause at 90,000 cfs at Gavins Point Dam allows time to inspect dams and ensure drawdown rate is safe and initiate rehabilitation requirements
- Gets water off the Federal and non-Federal levees sooner to reduce significant risks and allow other agencies to assess roads and other infrastructure impacted by the flood
- Stepped releases will allow floodplains to drain gradually and decrease chances of bank and levee erosion

## Upstream Considerations

- Releases of 85,000 cfs (reached around Aug. 17 at Garrison and Aug. 24 at Oahe) gets flows back within the channel at Bismarck, N.D. and Pierre, S.D.
- Stepped releases will allow saturated floodplains to drain gradually and decrease chances of bank and levee instability
- Holding 150,000 cfs at Gavins Point Dam for two weeks gets dams out of exclusive flood control storage sooner

# What would more flood control storage in 2012 mean?

- Water releases remain high through end of September
  - ▶ Water remains high on floodplains affecting more homes and communities
  - ▶ Water remains high on levees, increasing the risk of failure, overtopping, breaching
  - ▶ Water remains high on highways, bridges and other infrastructure
  - ▶ No flexibility to store additional runoff from another precipitation event

**More Flood Control Storage before the 2012 runoff season does not provide time for recovery or to prepare. It creates an unacceptable risk by exposing communities to high water longer.**

# Weather Forecasts:

## Remainder of 2011 and through 2012

- ENSO-neutral conditions into Fall 2011 with hints of La Nina conditions by late fall in MRB
  - ▶ Cooler temps
  - ▶ Precip = less predictable
- Upper Missouri River Basin:
  - ▶ July-Sep: Temps = Below; Precip = Above
  - ▶ Sep-Dec: Precip = Above
  - ▶ Late Fall into 2012: **Equal Chance** of Normal, Above, Below for temperature and precipitation

# Drawdown Goals

- Be Ready for 2012 Runoff Season
- In order to do that:
  - ▶ Get people back into their homes, farms and businesses
  - ▶ Corps inspects levees, dams; States/Counties/Communities inspect highways, other critical infrastructure
  - ▶ Begin repairs as soon as possible

Lower releases sooner = Earlier floodplain drawdown = Less risk of unexpected breach = Time to Prepare for 2012 Runoff Season

# Conclusion/Way Ahead

- Given keen interest in returning to homes, farms and businesses, time to drain water from inundated areas: drawdown as quickly as possible
- Given unknowns in condition of infrastructure, condition of levees with their unacceptable risks, and time needed to inspect, assess and initiate repairs: drawdown responsibly
- Given weather forecast, probability of occurrence, significance of 2011 event: use historical record as basis

# For Three Week Release Schedule

- <http://www.nwd-mr.usace.army.mil/rcc/reports/twout.html>

## For More Information, Visit

[www.nwo.usace.army.mil/](http://www.nwo.usace.army.mil/) and [www.nwk.usace.army.mil](http://www.nwk.usace.army.mil)

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