Missouri River Mainstem Reservoir System
Gavins Point Spring Pulse

Background Information

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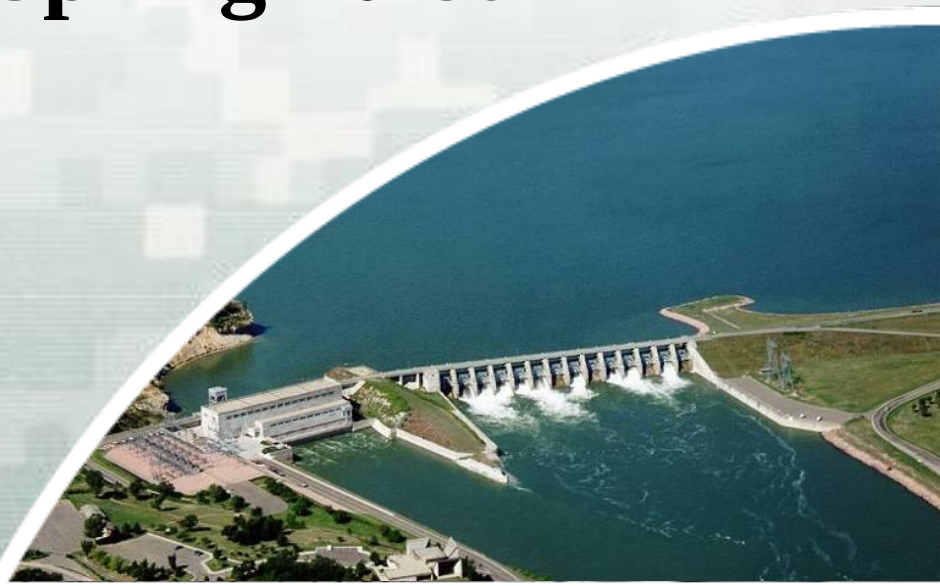
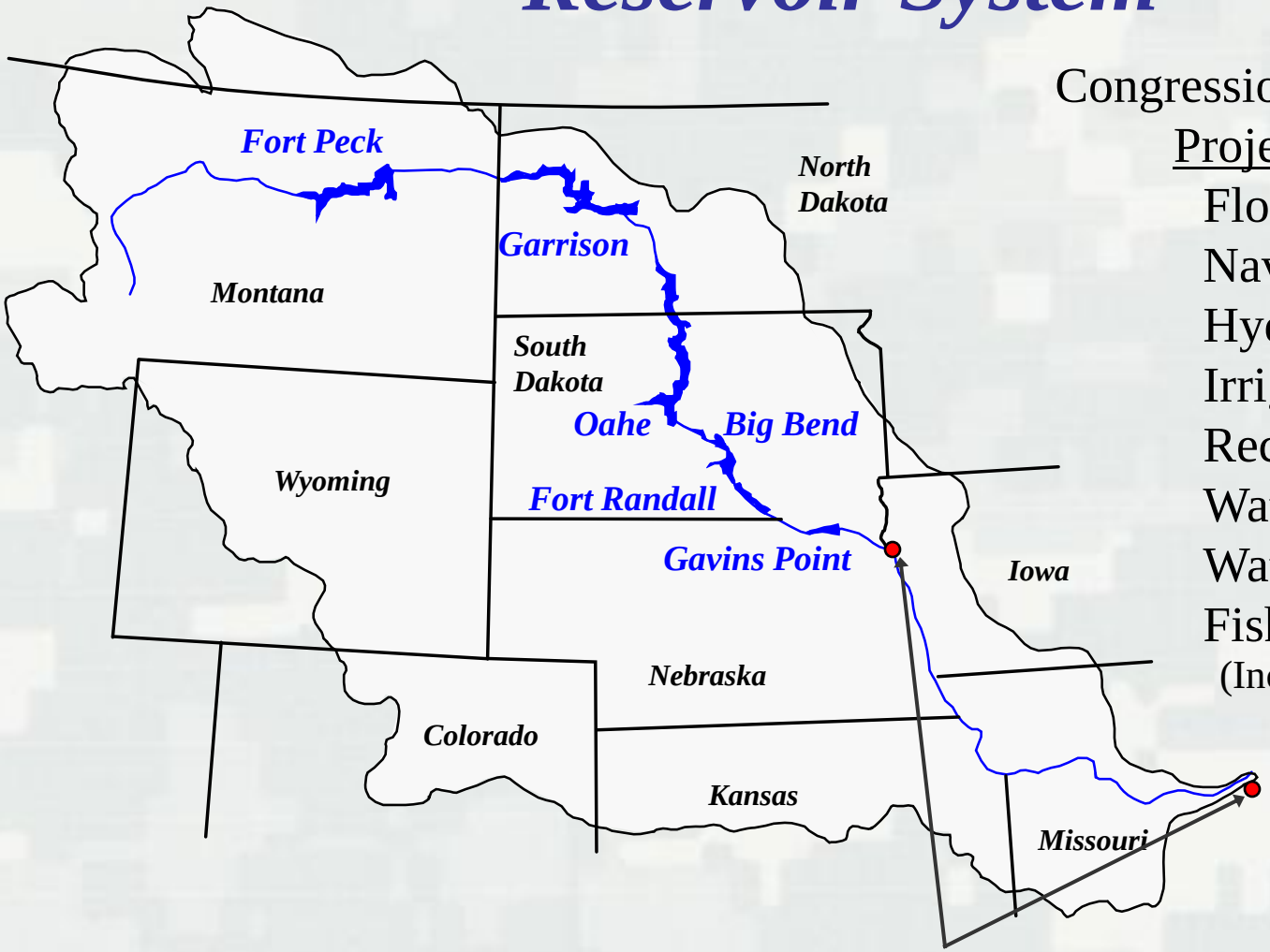
March 2011



US Army Corps of Engineers
BUILDING STRONG®

Missouri River Mainstem Reservoir System



Congressionally Authorized

<u>Project Purposes</u>

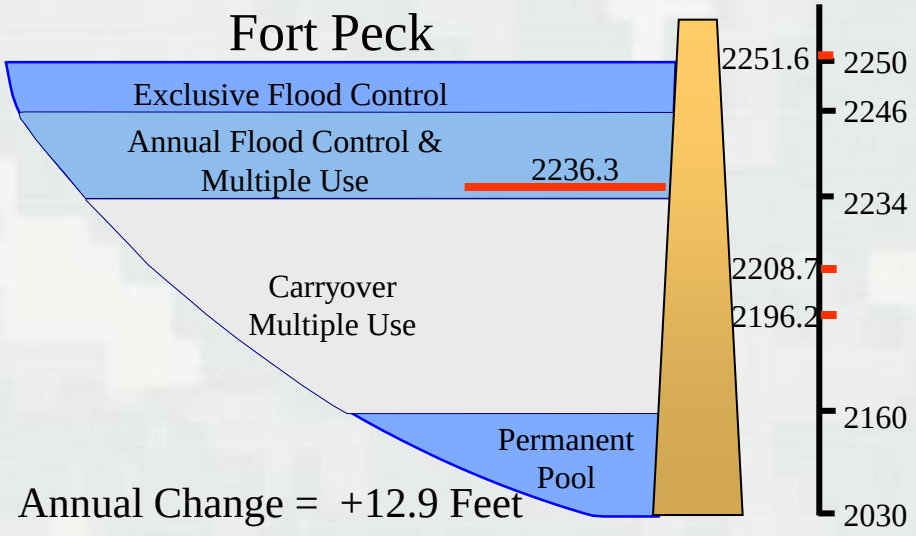
- Flood Control
- Navigation
- Hydropower
- Irrigation
- Recreation
- Water Supply
- Water Quality
- Fish and Wildlife

(Including endangered species)

Bank Stabilization and Navigation Project
Sioux City, IA – St. Louis, MO

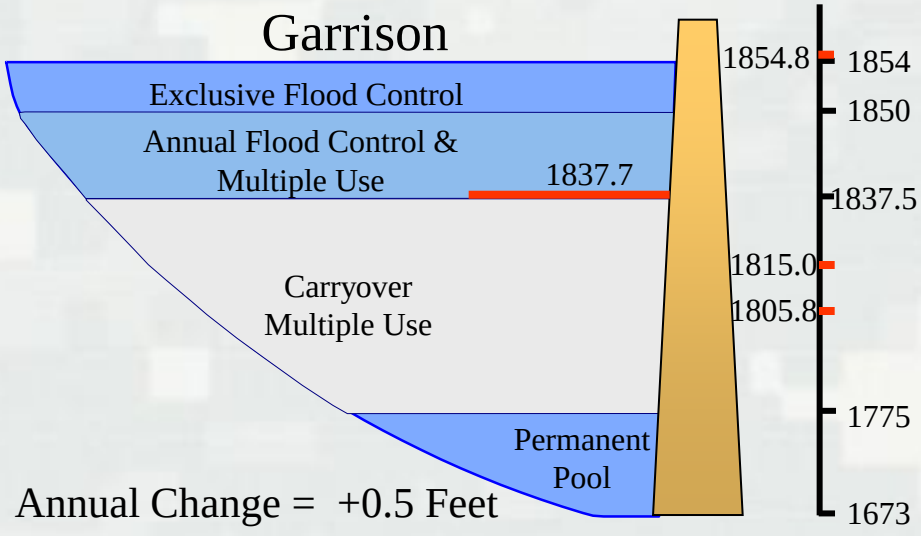
Current Reservoir Levels – March 15, 2011

Fort Peck



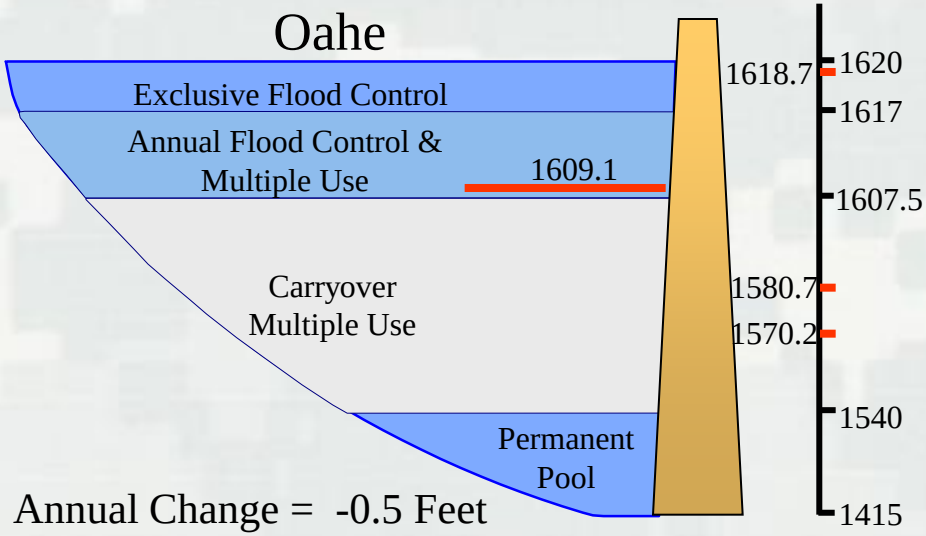
Annual Change = +12.9 Feet
2.3 feet above top of Carryover

Garrison



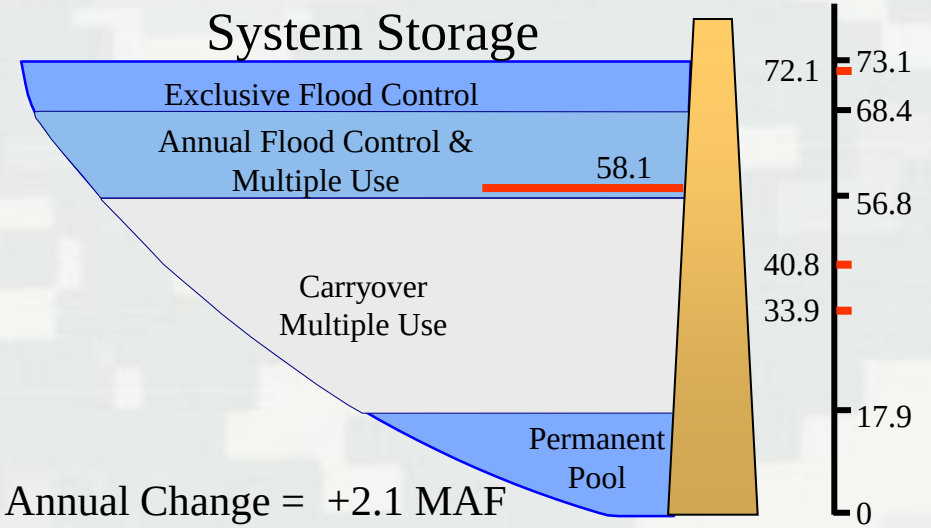
Annual Change = +0.5 Feet
0.2 feet above top of Carryover

Oahe



Annual Change = -0.5 Feet
1.6 feet above top of Carryover

System Storage

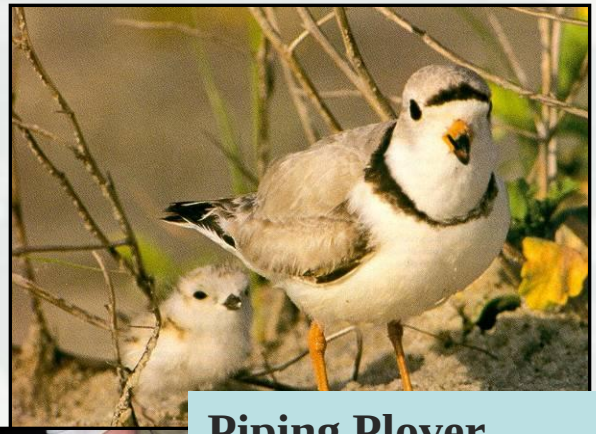


Annual Change = +2.1 MAF
1.3 MAF above top of Carryover

Endangered Species Act of 1973

Each Federal Agency shall... insure that any action authorized, funded, or carried out by such agency… is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat…which is determined… to be critical…

Interior Least Tern
Listed "Endangered" 1986

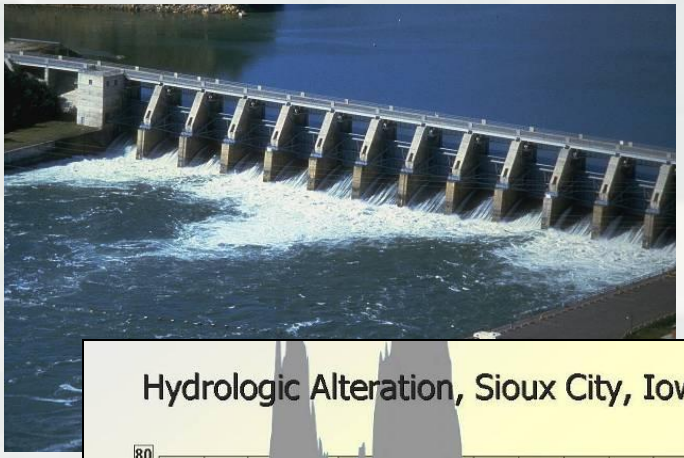


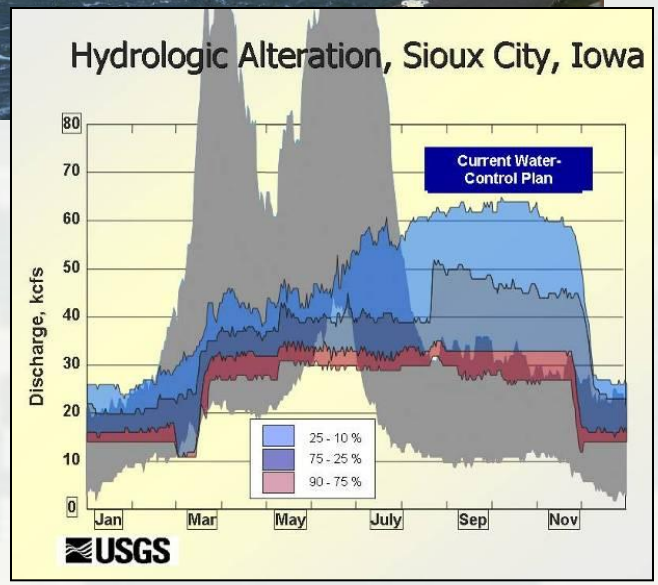
Piping Plover
Listed "Threatened" 1986

Pallid Sturgeon
Listed "Endangered" 1990

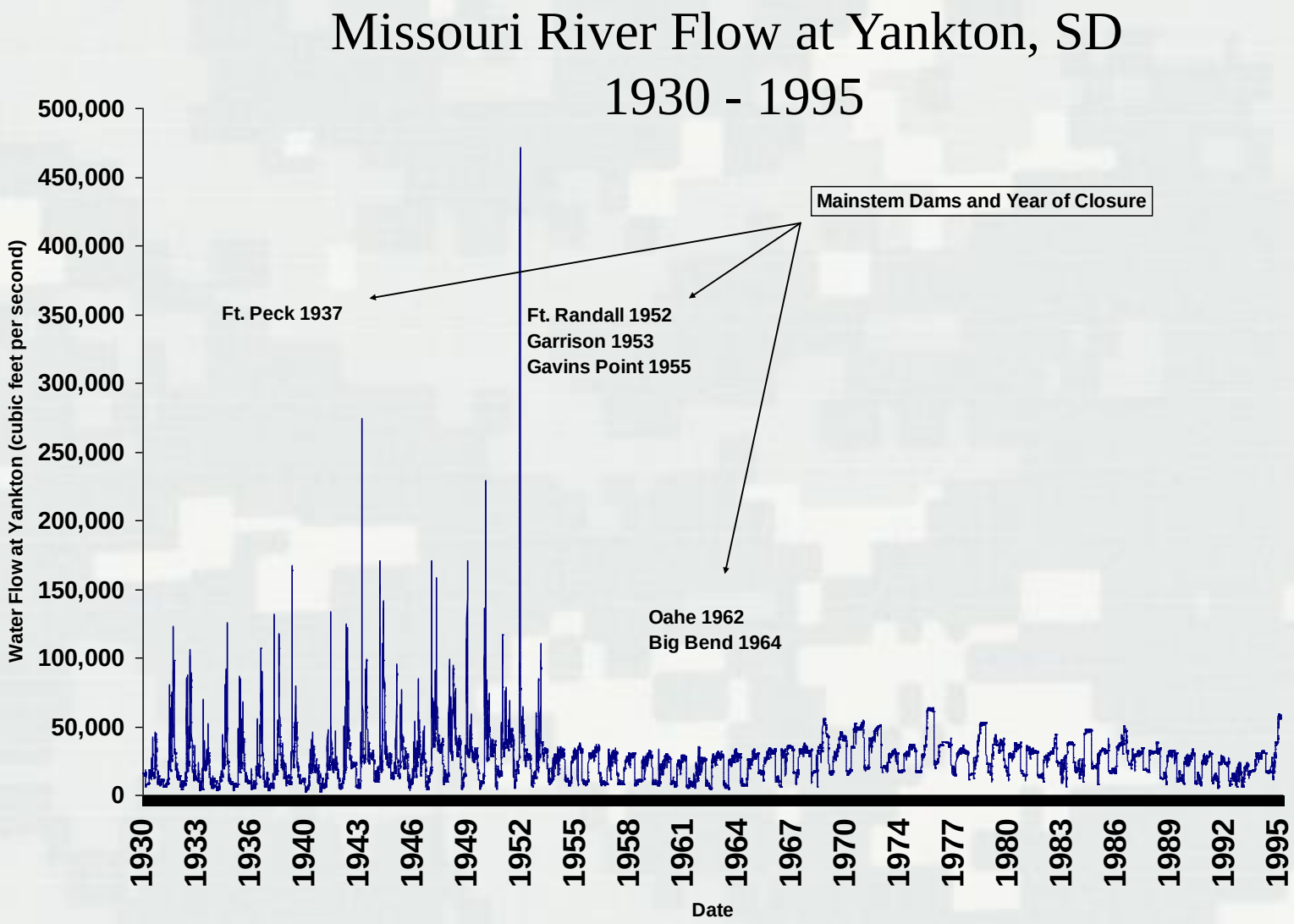
Biological Opinion

- On the Operation of the Missouri River Mainstem Reservoir System, Operation and Maintenance of the Bank Stabilization and Navigation Project, and Operation of the Kansas River Reservoir System
- Opinion issued by the USFWS in 2000 and Amended 2003
- Found that the operation of the system jeopardized the continued existence of the pallid sturgeon
- Identified reasonable and prudent alternatives and measures to prevent extinction





The Heartbeat of a River…Lost



Spring Pulses from Gavins Point Dam

- Part of a Reasonable and Prudent Alternative (RPA) in the USFWS 2003 Amended Biological Opinion to avoid jeopardy to the pallid sturgeon
- Master Manual revised in 2006 to include bimodal (March and May) spring pulse from Gavins Point dam

Spring Pulse from Gavins Point Dam

- Spring Pulse is intended to mimic the natural ebb and flow of the river
  - Provide suitable spawning cues
  - Provide connectivity to low lying lands
    - Increased productivity
    - Increased survival and recruitment
  - Condition spawning habitat
- Specific technical criteria in Master Manual define pulse magnitude, timing and duration
- Stop protocol included for drought and flood conditions

March Pulse from Gavins Point

- Estimated peak magnitude
  - 5,000 cfs minus the flow in the James River
  - Duration of peak flows = 2 days
  - Flows return to navigation level over 5 days
- Pulse initiated at start of navigation season
  - 21 March to 31 March

March Pulse from Gavins Point

- Estimated downstream stage change
  - Sioux City to Omaha 1.25 feet
  - Nebraska City to Kansas City 1.0 foot
  - Boonville to Hermann 0.5 foot
- Downstream flow limits in effect to reduce risk of flood damages
  - River forecast includes radar detected precipitation and NWS forecasted precipitation
- Monitoring in place
  - Biological
  - Socio-economic

March Pulse from Gavins Point

- Additional volume of water released during pulse
  - 40,000 acre-feet
- Water source during event
  - Fort Randall and Gavins Point
  - < 0.5 foot
- Impact at end of water year
  - Balance impact among upper three reservoirs
  - <0.1 foot lower than without March pulse

May Pulse from Gavins Point

- Estimated peak magnitude
  - 9,000 to 20,000 cfs depending on the 1 May system storage and runoff forecast
  - Duration of peak flows = 2 days
  - Flows return to navigation level over 10 days
- Timing between 1 May and 19 May
  - Water temperature
  - Nesting terns and plovers
  - Downstream flow limits

May Pulse from Gavins Point

- Estimated downstream stage change
  - Sioux City to Omaha 2.5 to 4.5 feet
  - Nebraska City to Kansas City 2.0 to 3.5 feet
  - Boonville to Hermann 1.5 to 3.0 feet
- Downstream flow limits in effect to reduce risk of flood damages
  - River forecast includes radar detected precipitation and NWS forecasted precipitation
- Monitoring in place
  - Biological
  - Socio-economic

May Pulse from Gavins Point

- Additional volume of water released during pulse
  - 120,000 to 240,000 acre-feet
- Water source during event
  - 1.5 to 3.0 feet from Fort Randall
  - 1 to 1.5 feet from Gavins Point
- Impact at end of water year
  - Balance impact among upper three reservoirs
  - 0.1 to 0.3 foot lower than without May pulse

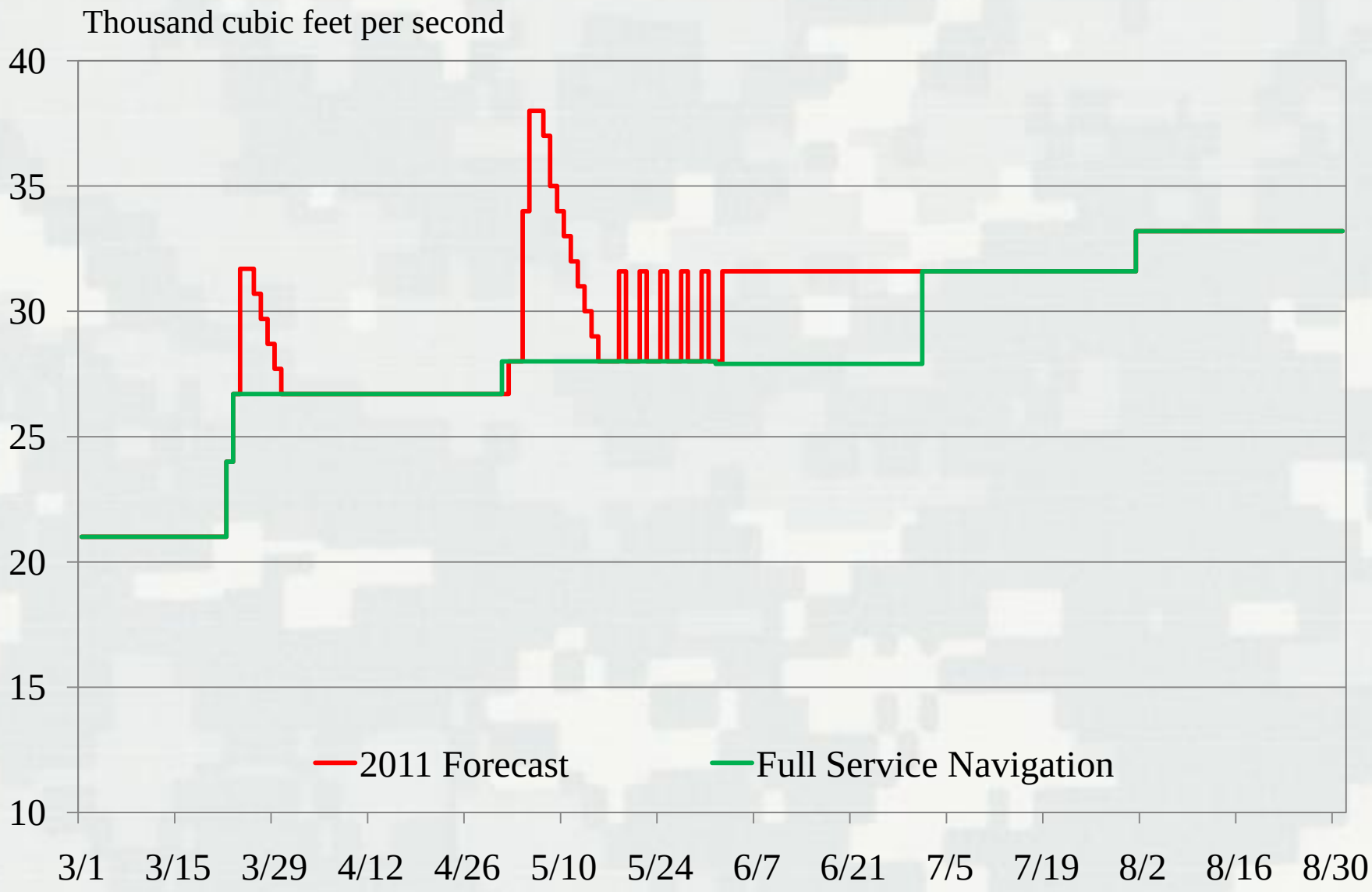
Spring Pulse History
2006 – 2008 Drought Period

- 2006
  - March spring pulse cancelled due to drought preclude
  - May spring pulse; peak magnitude of 9,000 cfs for 2 days
- 2007
  - Both spring pulses cancelled due to drought preclude
  - Natural pulses occurred out of the James River in March and May
- 2008
  - March spring pulse; peak magnitude of 4,500 cfs for 2 days
    - Pulse eliminated downstream of the Kansas River
  - May spring pulse cancelled due to drought preclude

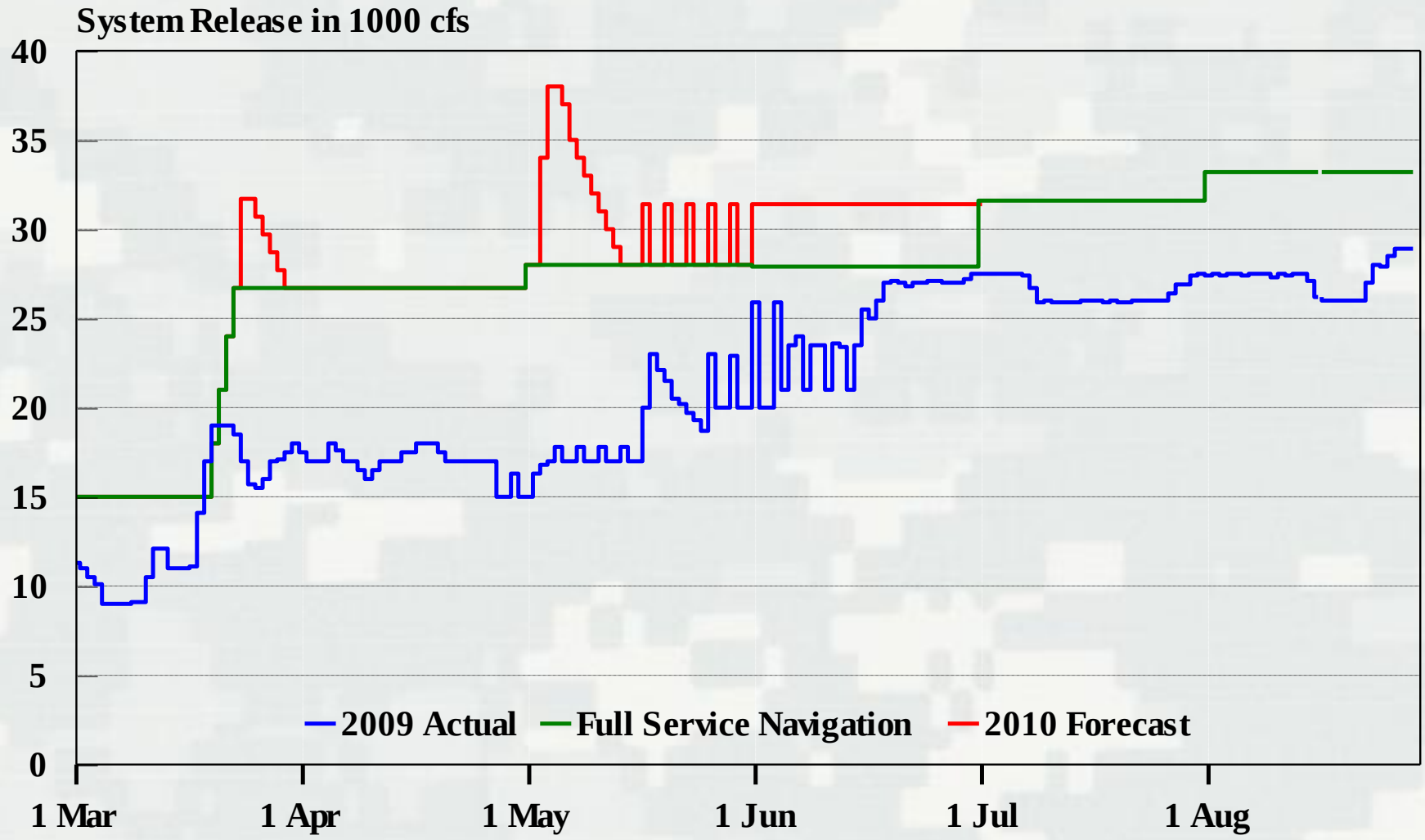
Spring Pulse History
2009-2010 High Water Period

- 2009 – first potential bi-modal spring pulse
  - March spring pulse cancelled due to downstream flow limits
  - May spring pulse; peak magnitude of 6,000 cfs for 2 days
    - Pulse eliminated downstream of the Kansas River
- 2010 – potential bimodal spring pulse
  - March spring pulse cancelled due to downstream flow limits and flows in excess of 5,000 cfs on the James River
    - Natural March pulse occurred out of the James River
  - May spring pulse cancelled due to downstream flow limits and cold water temperatures

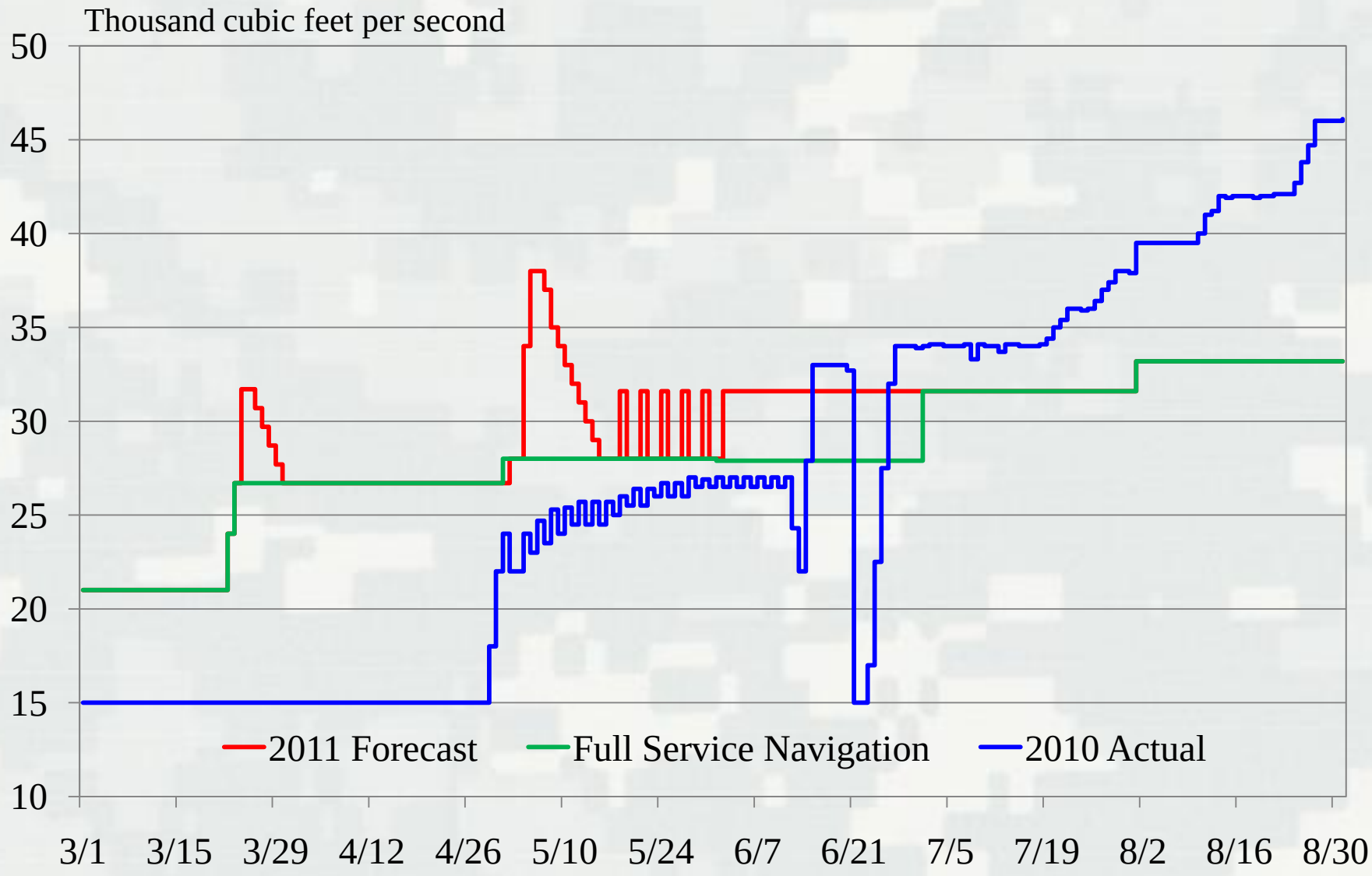
Gavins Point Releases



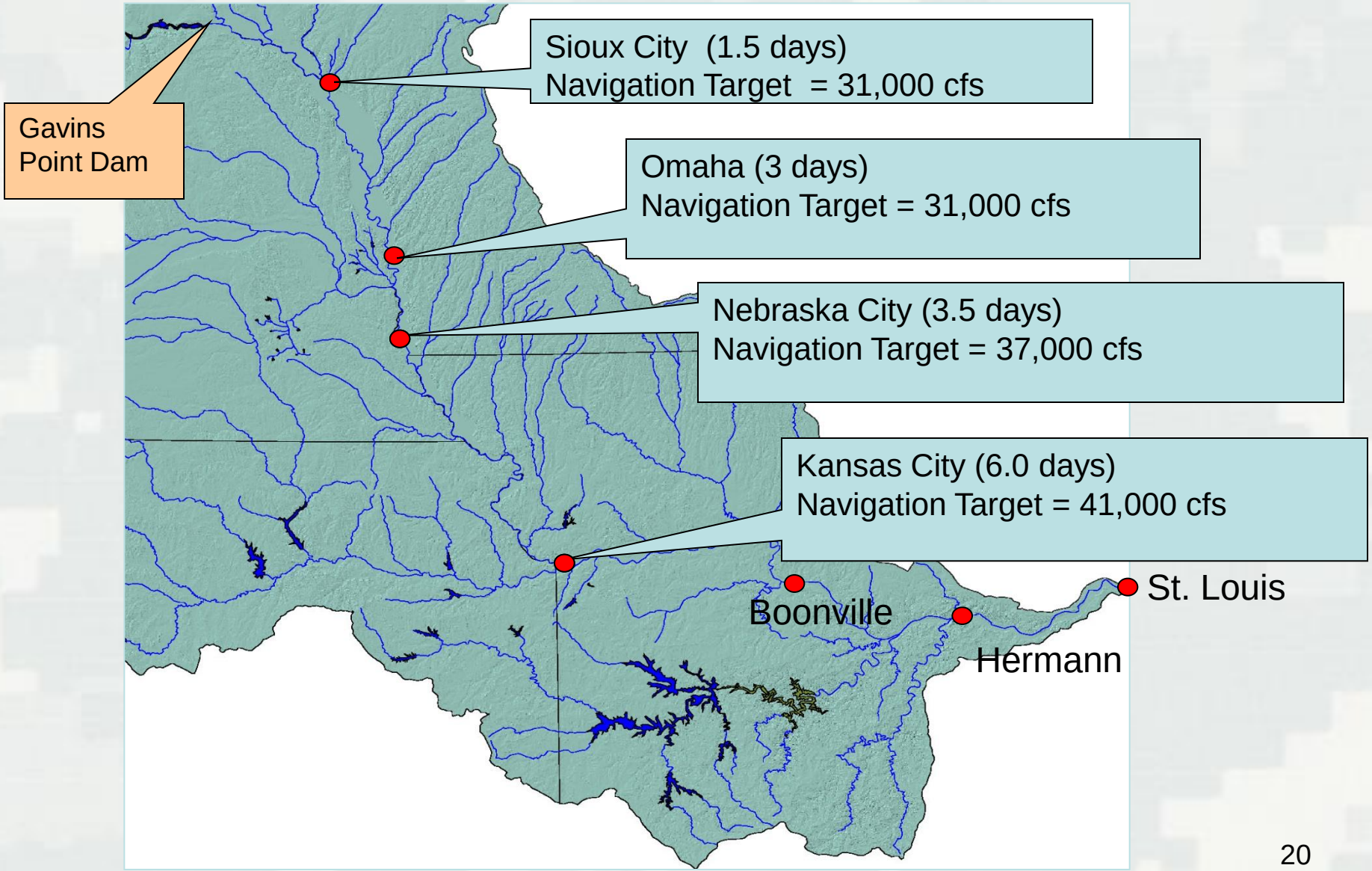
2009 Gavins Point Releases



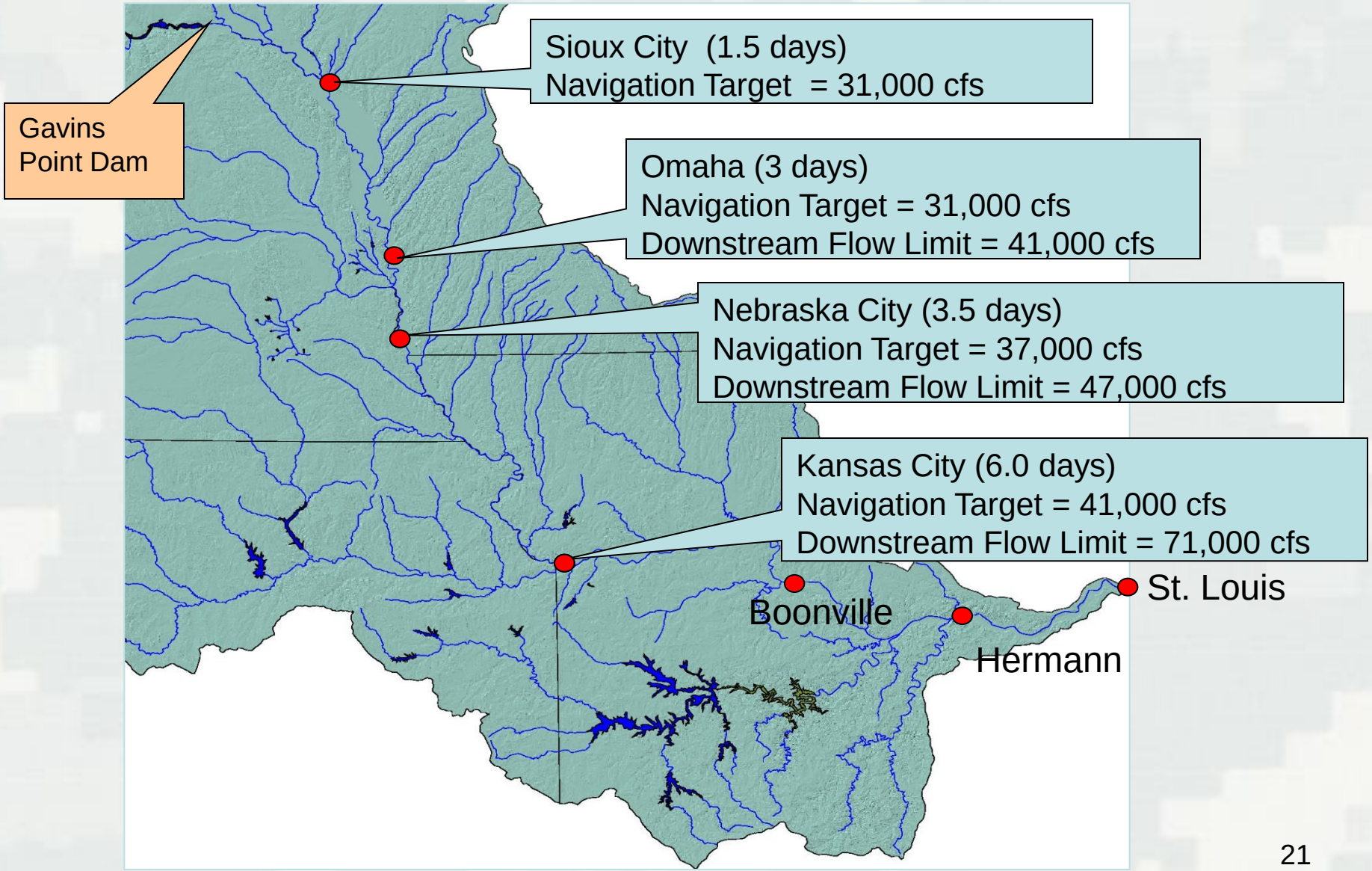
2010 Gavins Point Releases



Navigation Targets and Travel Times



Spring Pulse Downstream Flow Limits



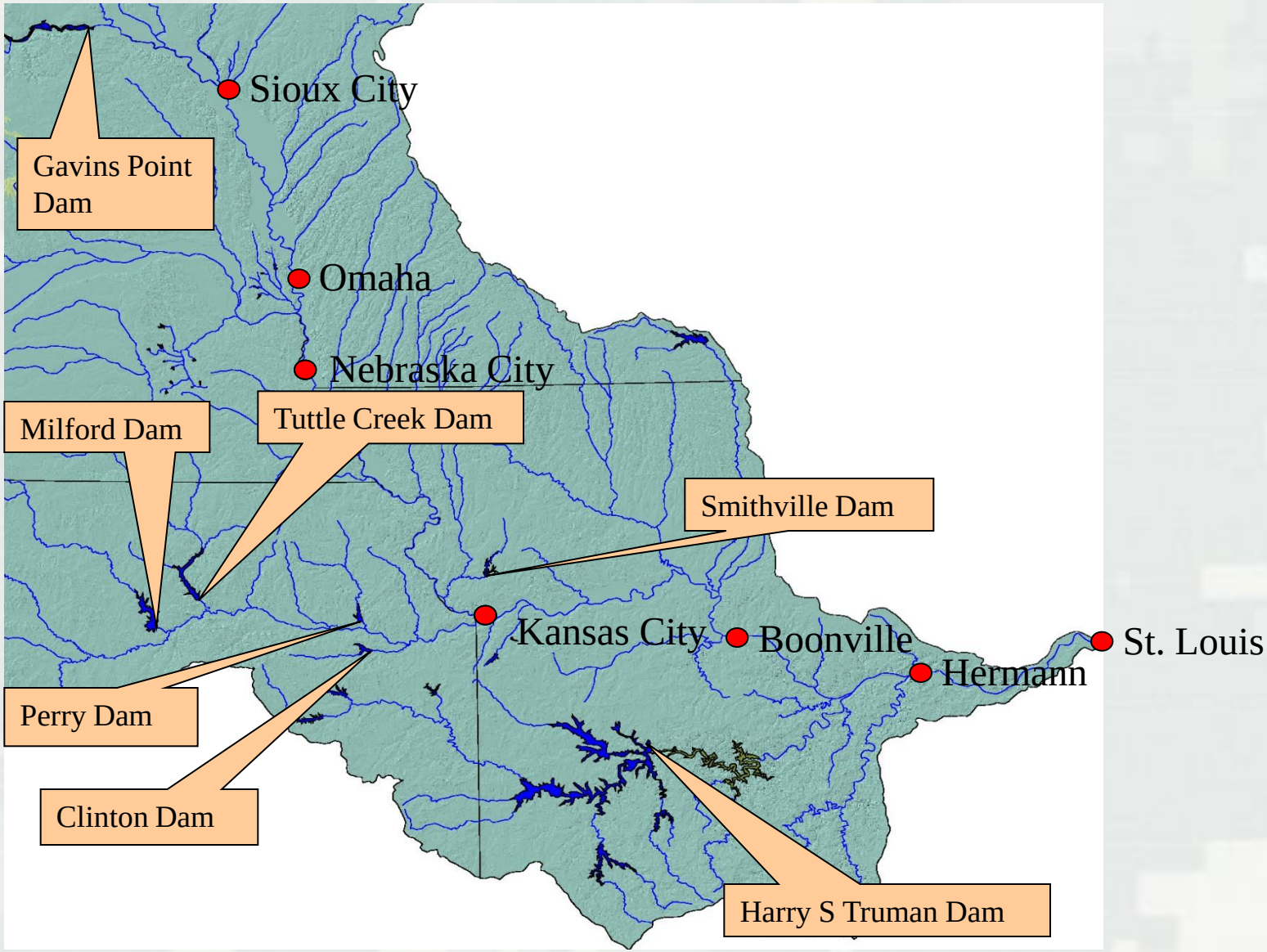
Elimination of Pulses below Kansas City

- USFWS has indicated:
  - The Gavins Point spring pulses are most important in the reach from the dam to the mouth of the Platte River just downstream of Omaha, NE
  - Below the confluence of the Platte and Missouri Rivers natural pulses occur with sufficient frequency to meet the requirements of the pallid sturgeon

Elimination of Pulses below Kansas City

- Releases from Corps' tributary projects may be adjusted to reduce or eliminate the spring pulse
  - If significant releases are being made from Corps tributary projects
  - And, if a temporary reduction in releases would not cause undue increased risk to other areas

Corps' Tributary Projects Potentially Available to Reduce or Eliminate the Spring Pulse



The Way Ahead

- Email updates will be provided several times each week leading up to the implementation or cancellation of the each pulse
- A daily PowerPoint briefing will be posted daily on our website at http://www.nwd-mr.usace.army.mil/rcc/ documenting the Corps decision process
- A conference call will be held immediately prior to implementation of either pulse.
- A press release will be issued announcing the implementation or cancellation of each pulse

Missouri River Recovery Program Independent Science Advisory Panel

- An Independent Science Advisory Panel (ISAP) was established in January 2011 in partnership with the Missouri River Recovery Implementation Committee (MRRIC)
- The panel is comprised of 6 science advisors who will provide independent science support and technical oversight on specific topics.
- Panel members include:
  - ▷ Margaret A. Palmer, Ph.D. – Aquatic/Riverine Ecologist
  - ▷ Martin W. Doyle, Ph.D. – River Hydrologist/Geomorphologist
  - ▷ Adrian H. Farmer, Ph.D. – Least Tern/Piping Plover Specialist
  - ▷ Christopher S. Guy, Ph.D. – Sturgeon Specialist
  - ▷ Steven M. Bartell, Ph.D. – Quantitative Ecologist/Statistician
  - ▷ Dennis D. Murphy, Ph.D. – Conservation Biologist

Missouri River Recovery Program Independent Science Advisory Panel

- The initial topic selected is 'Missouri River Spring Pulse and Adaptive Management'.
- Charge questions include:
  - Examine the goals and objectives of the spring pulse
  - Recommended metrics to assess the spring pulse
  - Identify ecological uncertainties and risk
  - Identify changes, modifications or additions to monitoring program
  - Identify focused investigations/research needs
  - Recommend data analysis and assessment methods
  - Examine potential management actions to evaluate as part of an Adaptive Management program
- Final Report scheduled for release in September 2011

Questions?

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