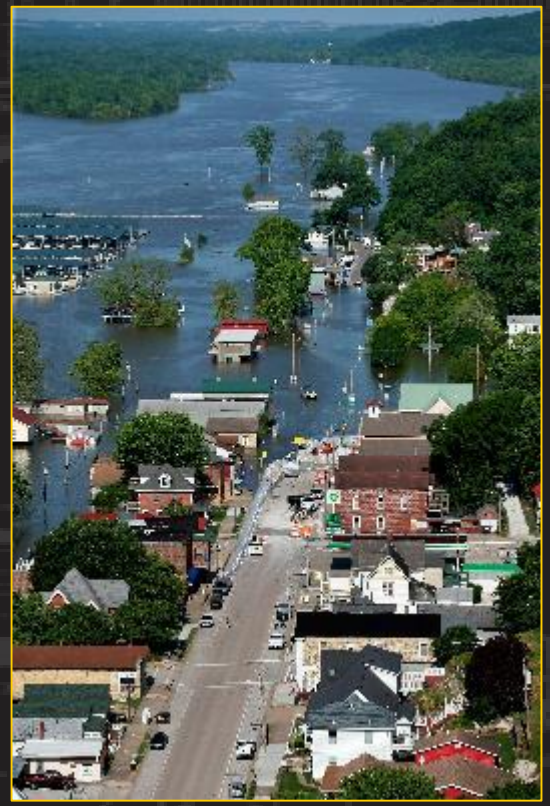
LOWER MISSOURI RIVER STUDIES

MISSOURI RAC

Colleen Roberts, PE
LoMo Program Manager, USACE

25 OCTOBER 2023



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LOWER MISSOURI RIVER STUDIES

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Study Overviews

- **Flood Risk & Resiliency Study**
- **Spin-off Studies**
- **Navigation Study**

Flow and Stage Frequency

Outreach and Contact Info

Questions

THERE'S A LOT GOING ON WITH THE MO RIVER

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- **Lower Missouri River Flood Risk & Resiliency Study**
- **LoMo Spin-off Studies – Holt, Brunswick, Jeff City**
- **Flow Frequency Analysis**
- **Stage Frequency Analysis**
- **LoMo Navigation Study**
- Navigation on the River
- Interception Rearing Complex (IRCs)
- Bank Stabilization and Navigation Project (BSNP) Structure Repairs
- Missouri River Recovery Program (MRRP)
- Active Construction Projects
- AND MORE!

LOWER MISSOURI RIVER FLOOD RISK & RESILIENCY COMPREHENSIVE STUDY

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Three historic, record setting floods in 30 years: **1993, 2011, 2019**

$Billions in Damages

Long-term impact to critical infrastructure; $1.2B in damages to levees, multi-year repair

It Will Happen Again

Without action, this highly vulnerable flood corridor will be left waiting for the next major event.

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Opportunity

Four States committed to a partnership to avoid repeating past inaction with a goal to develop actions to **reduce system risk and recurring damages, improve system resiliency for the future and improve interagency collaboration.**

2019: Planning Assistance to States study intended to assess areas of recurring flood damage

SYSTEM PLAN

Reduce Future Flood Risk & Recurring Damages
Improve System Resiliency

- Brunswick
- Jefferson City
- Holt County

LOMO STUDY MISSION AND AUTHORIZATION

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Mission Statement:

Work with basin states, Tribes, stakeholders, other agencies, and the public to create ***a vision for a more resilient future*** *for the Lower Missouri River with a focus on flood risk management. The system study will* ***evaluate reach and system specific*** *alternatives and* ***provide recommendations of future spin-offs and proposed implementation approaches****.*

Section 216 of WRDA 2020 authorized expansion of an initial feasibility study to a broader lower basin effort of a system evaluation over **735 Missouri River miles from Sioux City, Iowa, to the mouth near St. Louis, Missouri.**

The authority allows for site-specific feasibility studies (spin-off studies) in priority flood risk areas to begin the feasibility study *prior to completion of the system plan.*

Next Milestone Date: Interim System Plan Report to U.S. Congress to be completed December 2023
Study Completion: March 2027

Developing the future road map

Key Products:

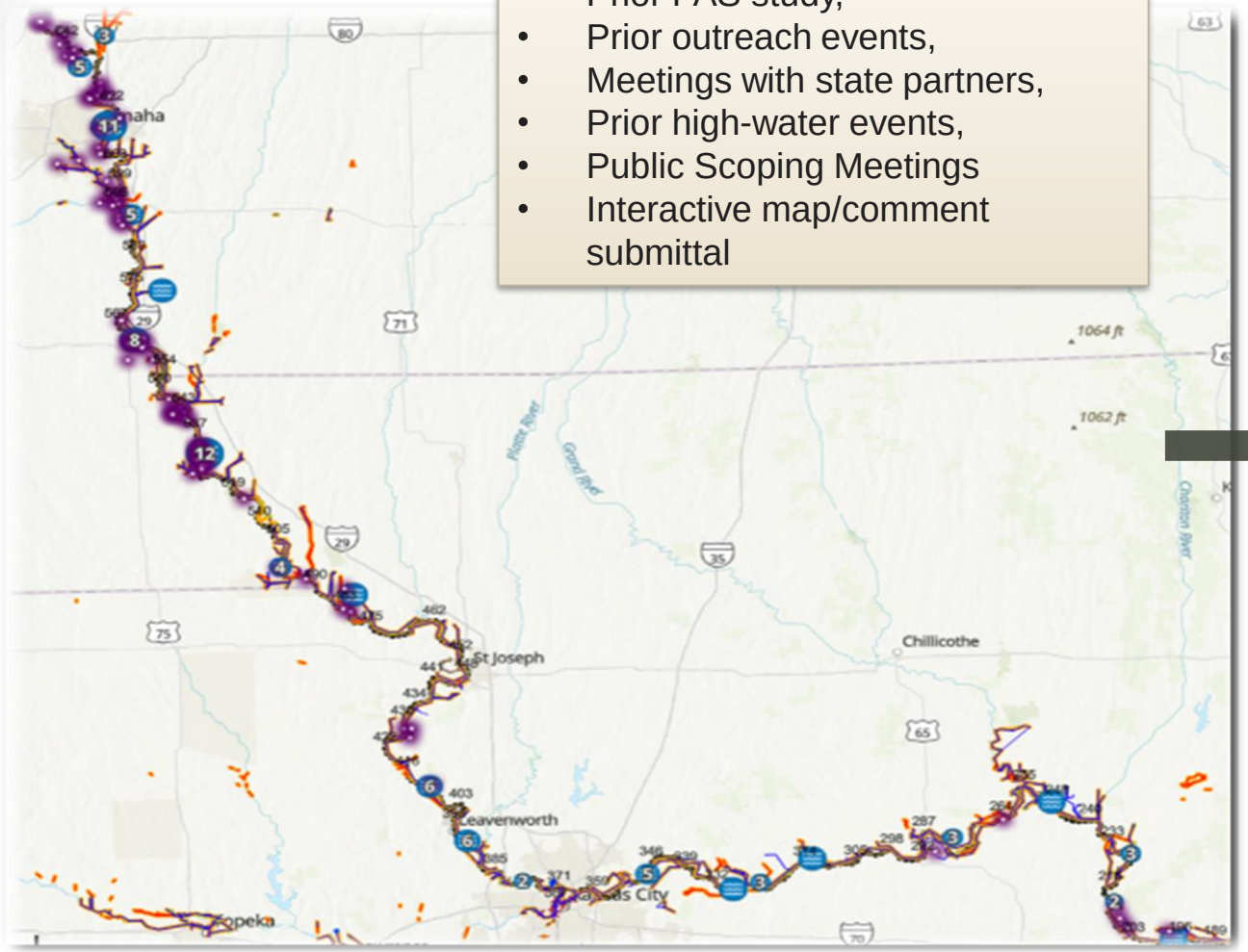
- HEC-RAS model with updated LiDAR and bathymetry,
- Blueprint/Road Map for the future,
- Past Performance Assessment,
- Updated flow and stage frequency relationship

MAP OF SITES

To add or review locations, head to https://www.nwk.usace.army.mil/Missions/Civil-Works/Civil-Works-Programs-And-Projects/Lower-Missouri-River-Basin/ and scroll down until you see ArcGIS Interactive Map Now Available on the right.

Sites have been identified during:

- Prior PAS study,
- Prior outreach events,
- Meetings with state partners,
- Prior high-water events,
- Public Scoping Meetings
- Interactive map/comment submittal



Reach/system modeling

LOMO SPINOFF STUDIES

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Holt County, MO/ Doniphan County, KS

Location: The study area includes the floodplain along roughly fifty Missouri River miles from **Nishnabotna to St Joseph, Missouri**.

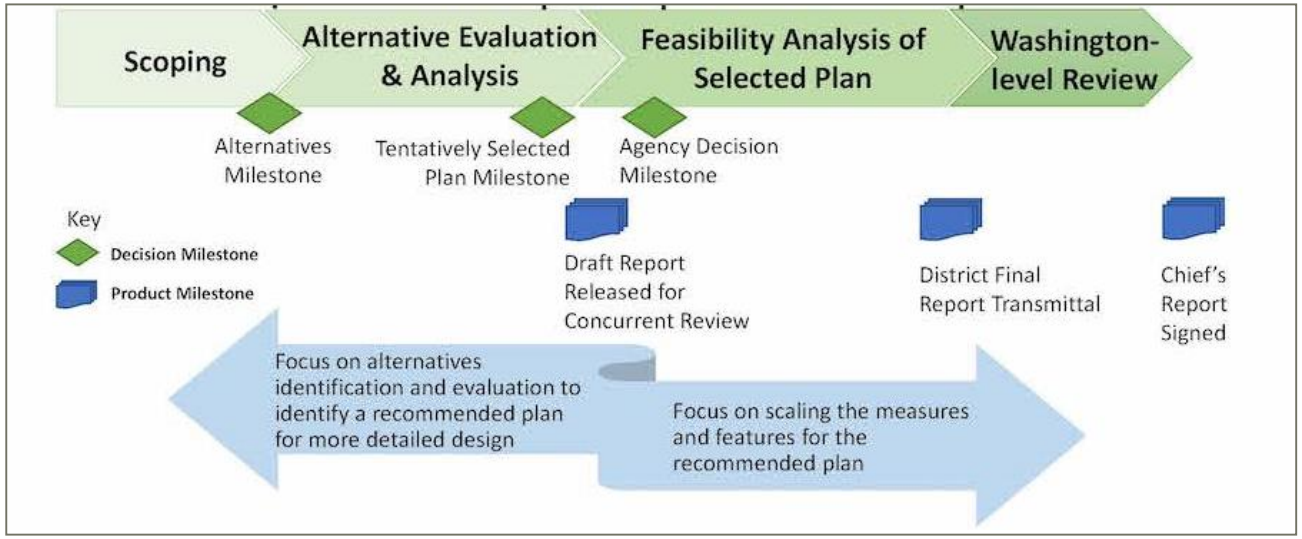
Brunswick, MO / L246

Location: The study area is along the **left bank of the Missouri River and bordered by the Grand and Chariton Rivers.** This area includes the city of Brunswick and the area behind Missouri River Levee System (MRLS) L-246 within Chariton County, Missouri.

Jefferson City, MO / L142

Location: The study area includes **the north or left bank** of the Missouri River at Jefferson, City, Missouri, vicinity mile marker 142.

Project	River Miles	Levee Length (Mi)	Protected Area (sq mi)
Holt	55	161	210
Brunswick	17	44	47.7
Jeff City	5	8	5



The purpose of each study is to investigate methods to reduce/**manage flood risk** within the project area, evaluate measures and **recommend a plan to reduce recurring damages**, costs, and improve resiliency of the flood risk infrastructure and protected investment for the future.

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LOWER MISSOURI RIVER FLOOD RISK & RESILIENCY PROGRAM

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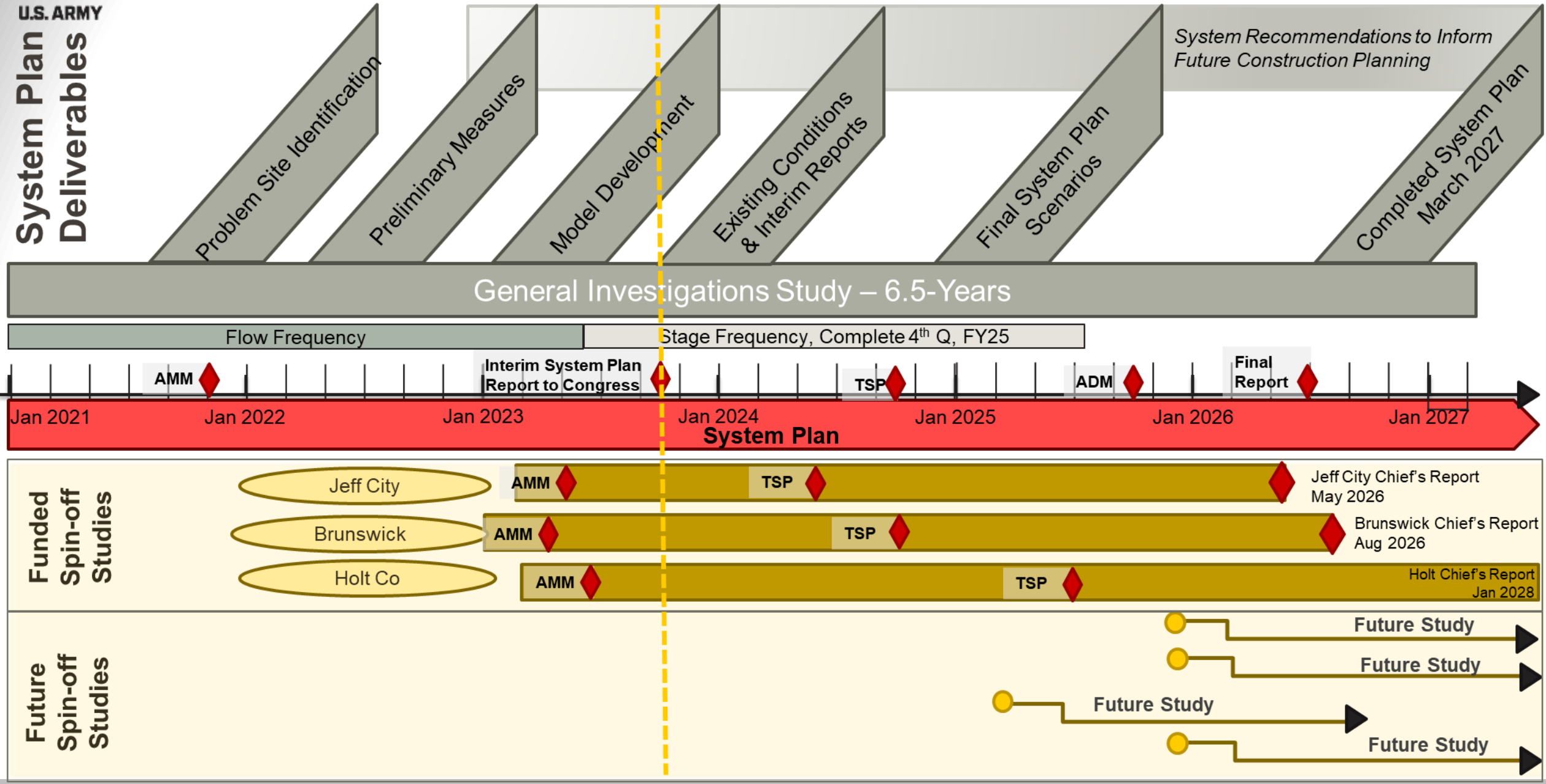


MO RIVER NAVIGATION STUDY

Description/Scope:
Study to improve the performance of the Missouri River Bank Stabilization and Navigation Project (BSNP) in sustaining the navigation channel challenged by changing conditions and extreme flow regimes. Study will evaluate structural (engineering), operational and maintenance measures for potential improvements.

Status:
Team completed initial scoping (referred to as Alternatives Milestone Meeting). The study has been on hold since mid-2022 but is kicking back off.

Way Ahead:
Team has received sponsor funds and working on refining scope. Continuing to work with sponsor/stakeholders.

WHAT IS FLOW FREQUENCY AND WHY IS IT IMPORTANT??

Flow frequency analysis calculates the annual probability that a flow will be met or exceeded at a specific location.

Flow frequency paired with stage frequency is a critical update needed to formulate localized solutions such as the current and future spin-off studies as well as action and planning for flood risk management in the Lower Missouri Basin.

WHY IS THIS IMPORTANT

- Provides accurate information for planning and future design purposes.
- Formulate solutions for increased flood risk on today's river.
  - ***20-year-old data isn't reflective of today's river***
- Flooding will occur again and want stakeholders to be prepared and understand the risk that exists today.

SUMMARY OF FLOW FREQUENCY RESULTS AT 10 MAINSTEM GAGES

- Increased flows for less frequent events from 2003 to 2023 with some exceptions below the Grand River
- Increased more upstream of Kansas City, MO (1993 is the record regulated flood below St. Joseph, 2019 or 2011 upstream)
- Generally minor changes in frequent floods

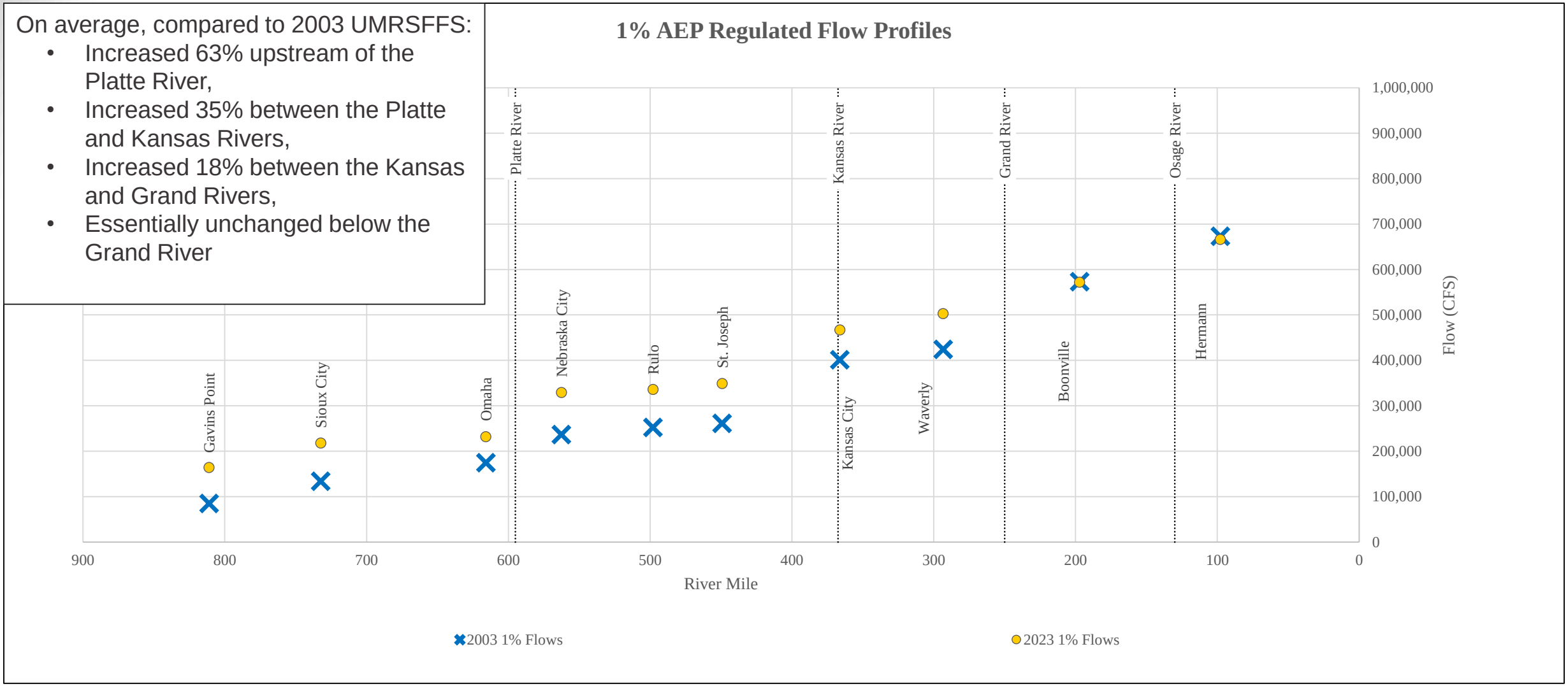
Missouri River Gages:

Yankton, SD
Sioux City, IA
Omaha, NE
Nebraska City, NE
Rulo, NE
St. Joseph, MO
Kansas City, MO
Waverly, MO
Boonville, MO
Hermann, MO

1% AEP REGULATED FLOWS

On average, compared to 2003 UMRSFFS:

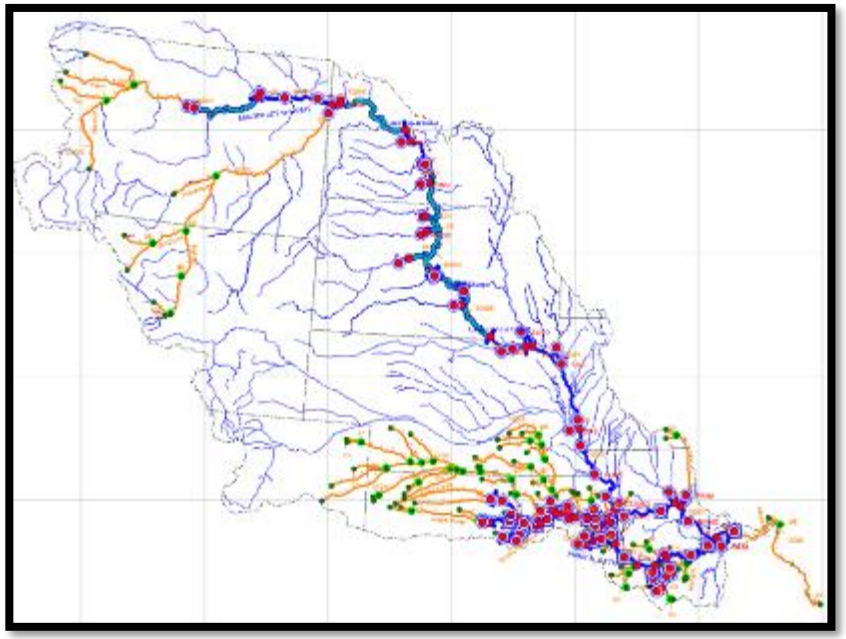
- Increased 63% upstream of the Platte River,
- Increased 35% between the Platte and Kansas Rivers,
- Increased 18% between the Kansas and Grand Rivers,
- Essentially unchanged below the Grand River



STAGE FREQUENCY ANALYSIS

Scope:

- Annual chance of exceeding a given stage (feet) in any year
- Incorporates hydraulic impacts on stage-flow, e.g., inflow timing, tributary backwater effect, bridges, levees
- Accounts for timing and shifts in the river to determine stage frequency between gages
- Will provide risk information to specific levee units
- Complete 4Q FY25



Status:

- Kick-off meeting with Technical Review Group for Stage Frequency
- Hydraulic Models in development and calibration
- Outreach in Winter 2023 for Stage Frequency scoping
- Please continue to request one-on-one meetings

University Representatives
University of Nebraska at Lincoln
Iowa Flood Center - University of Iowa
University of Missouri Water Center
Oregon State University
University of Kansas
Federal Partners
FEMA Region 7
Missouri Basin Forecast Center – NOAA
USGS IA/IL/MO Water Science Center
Fed Highways
FEMA HQ
State Floodplain Mapping Partners
Iowa DNR Mapping Program
Nebraska DNR Mapping Program
Kansas Floodplain Mapping Program
Missouri Floodplain Mapping Program

CONTACT INFO AND FUTURE OUTREACH

USACE Contact:
Find recorded webinars, future outreach events, flow frequency report, and more on our website!

Please direct any inquiries to:

Colleen Roberts (NWK) or
LOMORIVERSTUDY@USACE.ARMY.MIL

https://www.nwk.usace.army.mil/Missions/Civil-Works/Civil-Works-Programs-And-Projects/Lower-Missouri-River-Basin/

Quarterly LOMO System Plan Updates:

- **Webinar: January 17, 2024; 12:00 p.m. CST**
- Webinar: April 17, 2024; 12:00 p.m. CST
- Webinar: July 17, 2024; 12:00 p.m. CST
- Webinar: October 16, 2024; 12:00 p.m. CST

https://usace1.webex.com/meet/lomoriverstudy

- Call-in Information:
- +1-844-800-2712 US Toll Free
- Access code: 1995 72 4514

QUESTIONS??

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