

Envisioning a New River Future with Greater Societal and Wildlife Benefits

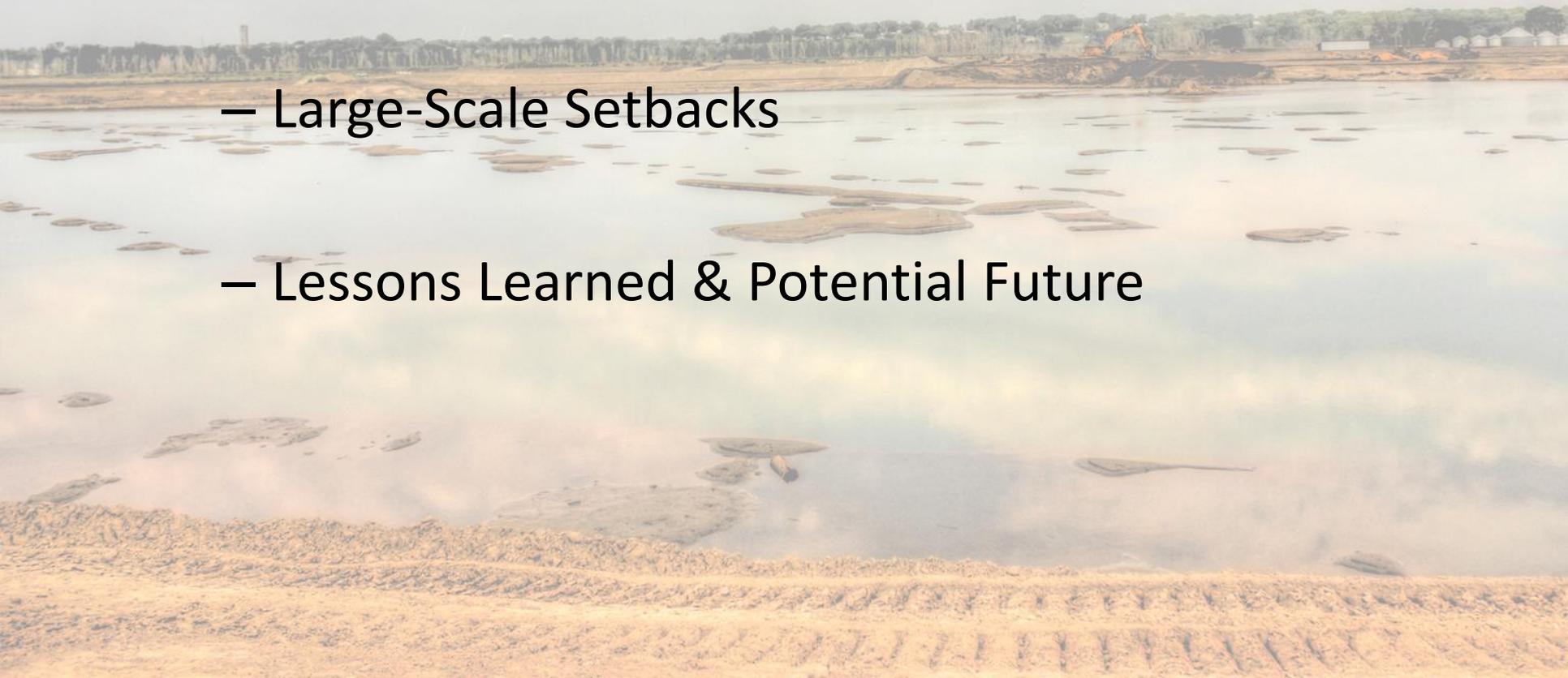
Large-scale Levee Setbacks Along the Missouri River

A wide river with a muddy bank in the foreground and a construction site in the background. The sky is overcast with grey clouds. In the distance, there are trees and some buildings, including a large white silo. An orange excavator is visible on the right side of the riverbank.

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NCER
Chicago, IL
August 1, 2013

Presentation Outline

- Looking Back - Missouri River Overview and Historic Flood of 2011
- Large-Scale Setbacks
- Lessons Learned & Potential Future

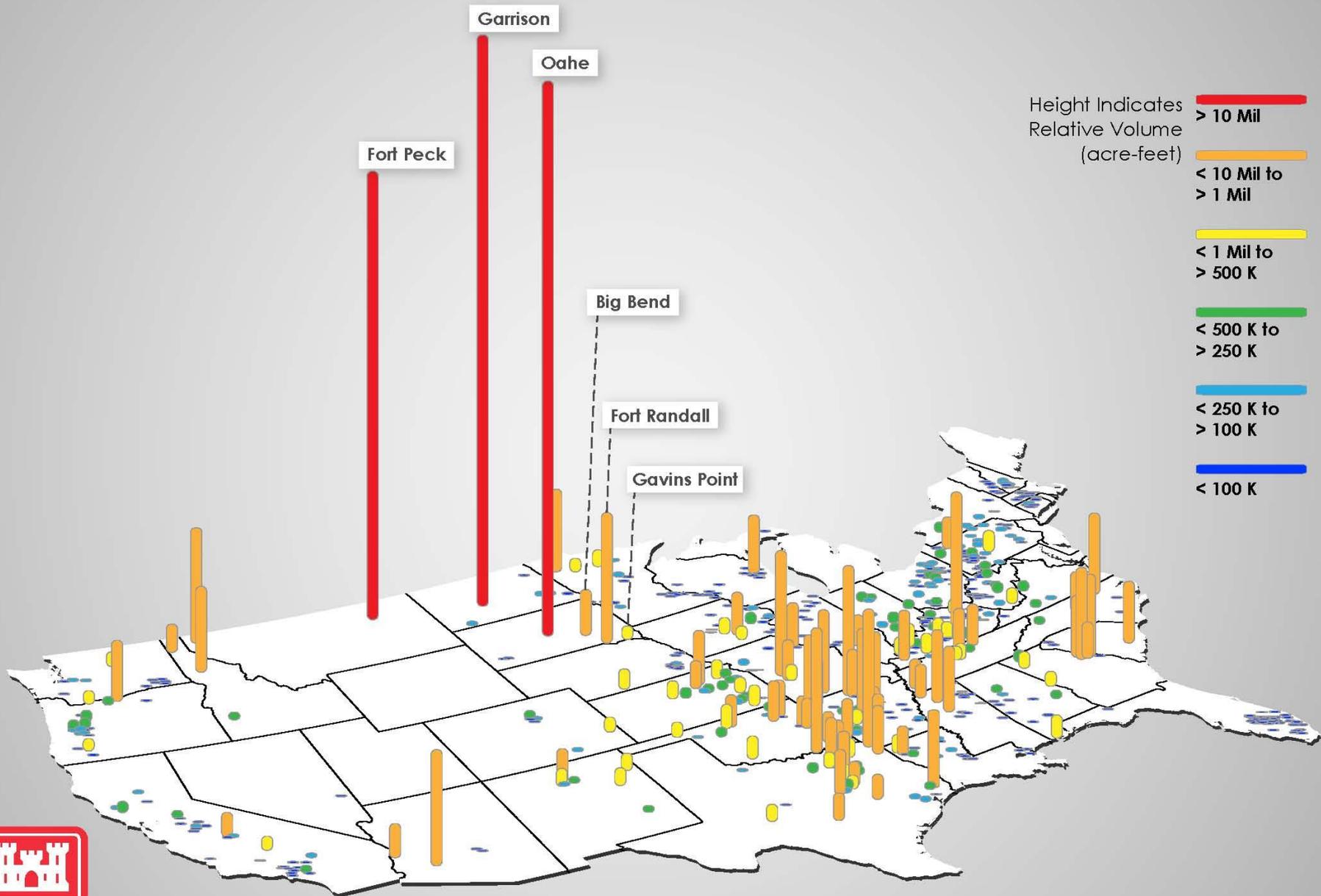


The Missouri River

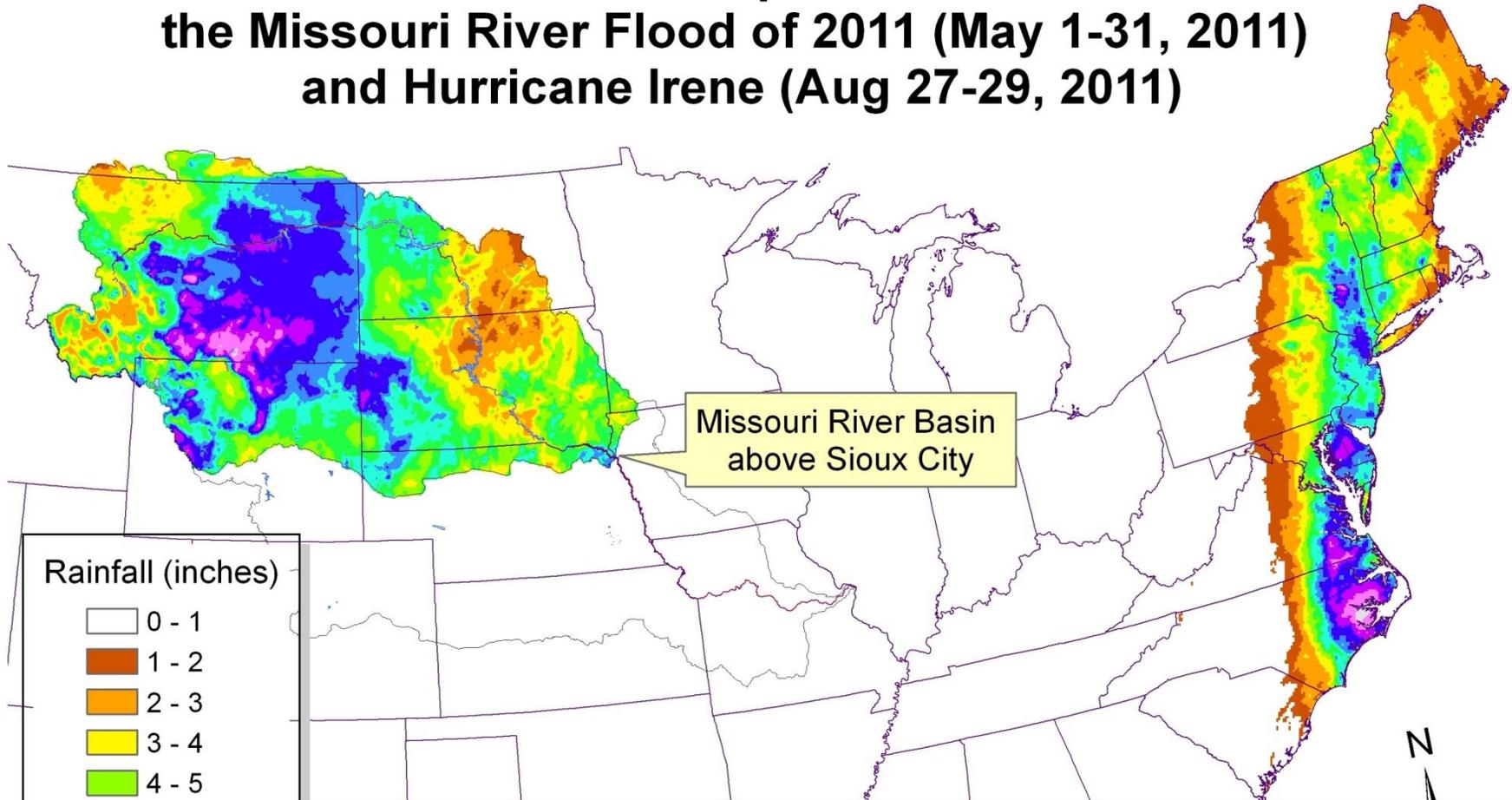
- Nation's longest River (~2,400 miles)
- From Three Forks, MT to St. Louis, MO
- Drains 1/6th of the United States
- Existing Missouri River Recovery Program (MRRP) Mitigation and ESA



Storage Capacity of Corps Reservoirs

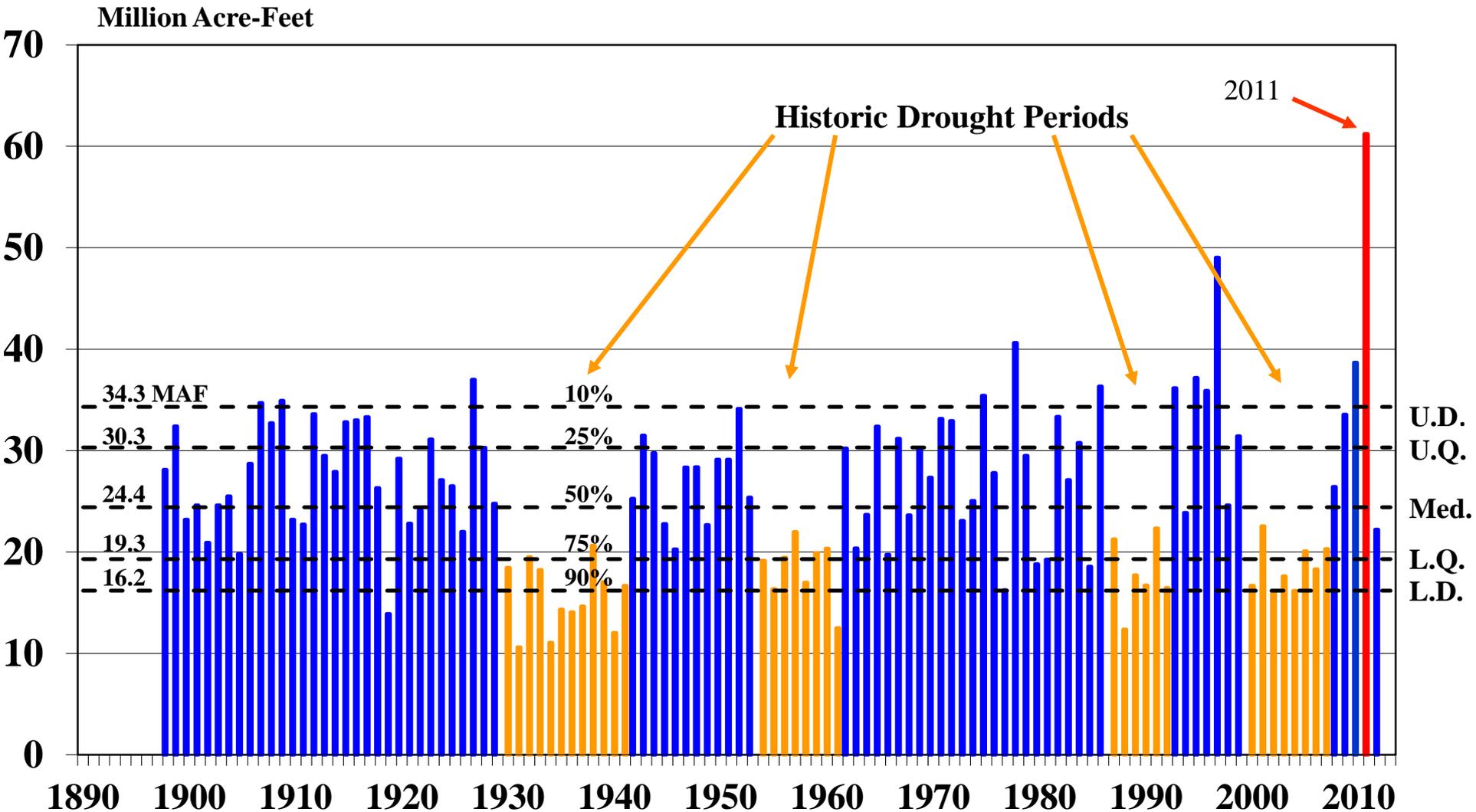


Rainfall Comparison for the Missouri River Flood of 2011 (May 1-31, 2011) and Hurricane Irene (Aug 27-29, 2011)



2011 Runoff = **61.0** MAF, 247 % above normal
Highest runoff in 115 years of record keeping
-combined 2011 May-July runoff of 34.3 MAF was
higher than 102 of 115 years of record keeping
Previous Record was 49.0 MAF in 1997

Missouri River Mainstem System Annual Runoff above Sioux City, IA



I-29 and I-680

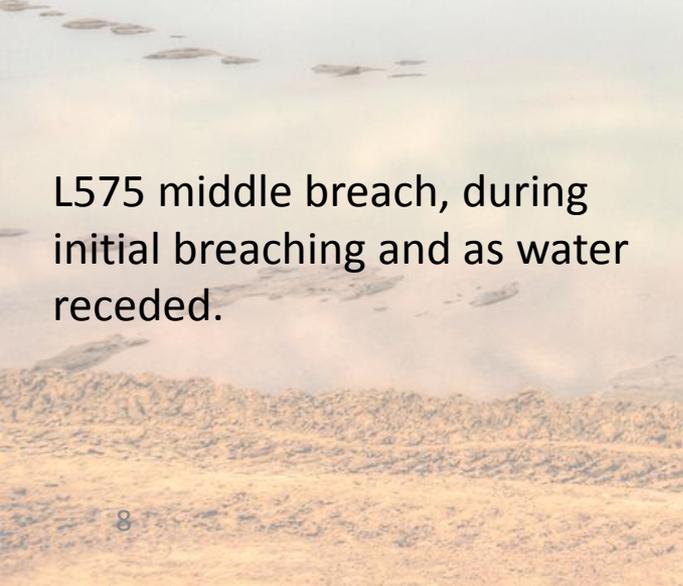


Photo credit: Iowa DOT, September 2011



Photo credit: Iowa ANG Airwing, July 2011

5 Levee Breaches on 2 Systems



L575 middle breach, during initial breaching and as water receded.



Levee Scour and Seepage Along L-575





Cass

Shenandoah

Fremont

Nebraska City

Otoe

Syracuse



Cass

Otoe

Nebraska City

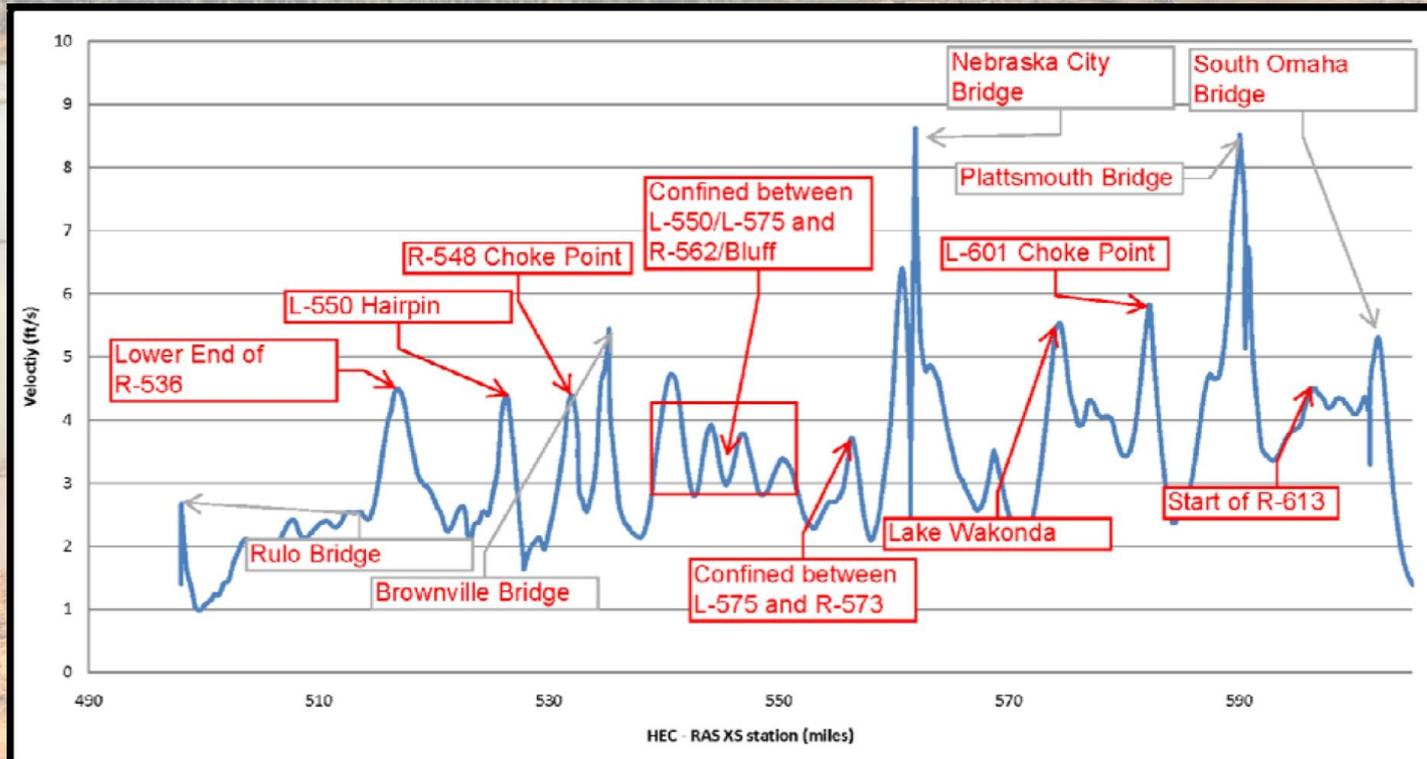
Fremont

Shenandoah

Syracuse

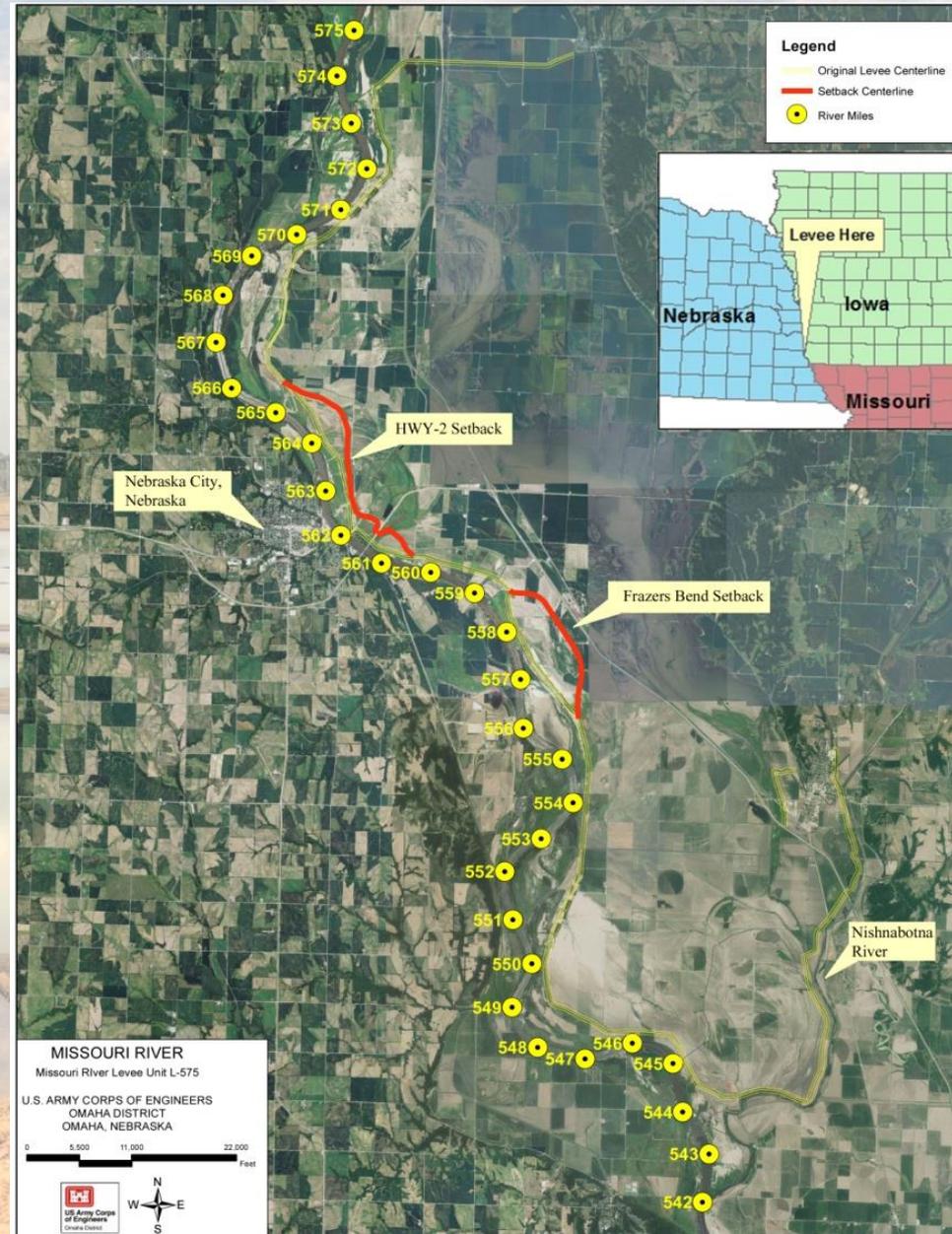
Conceptual Levee Setback Report

- Question do we do something different – Report April 2012
- Considered results of prior studies (e.g., 1993 Galloway Report)
- Potential to use or target federal lands to be part of solution
- Identification of 16 major constriction points:



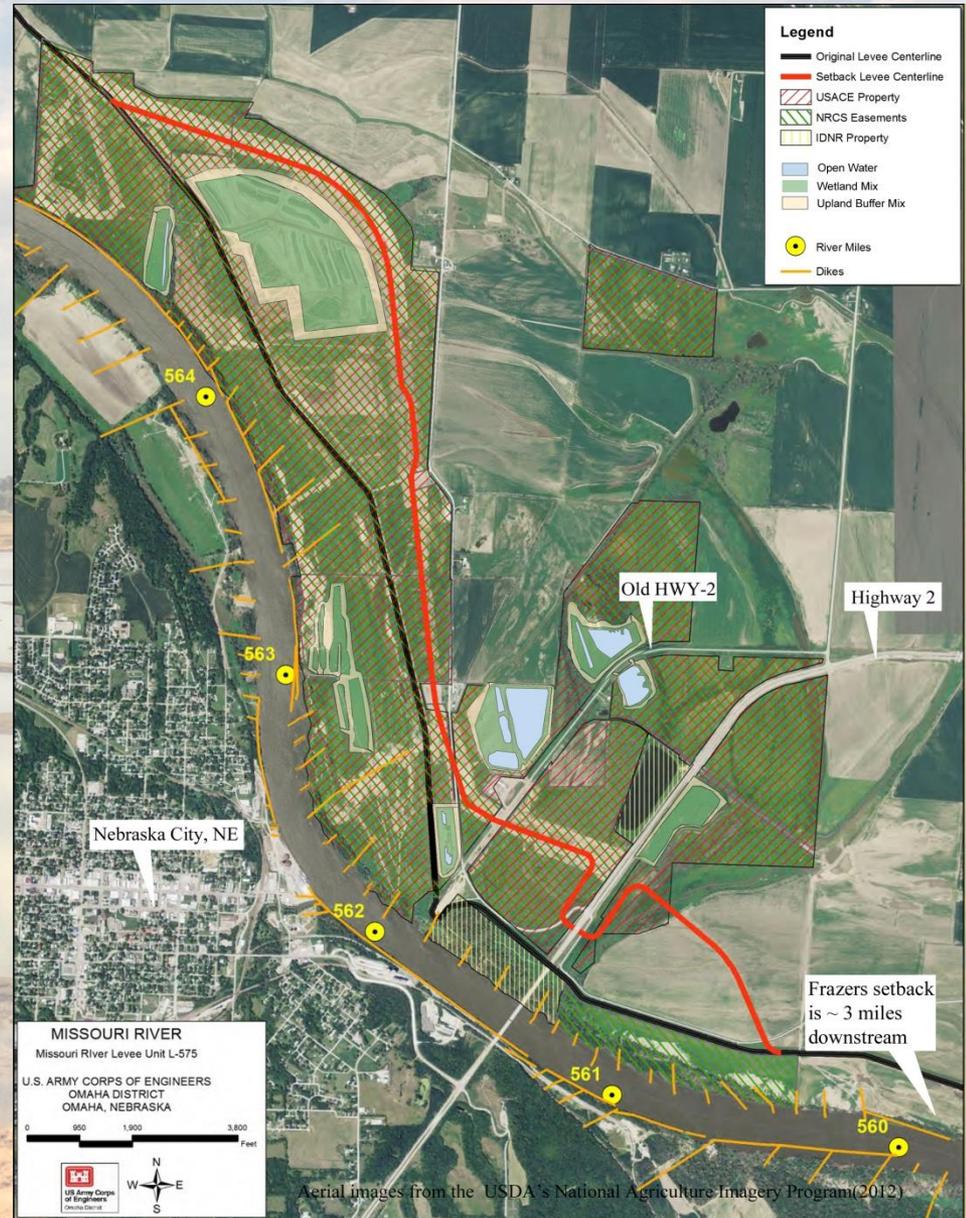
Large-Scale Levee Setbacks

- Setbacks conducted on levee system L-575, near Nebraska City, NE
- Authorized under Emergency Levee Rehabilitation Program
 - massive levee damage at two reaches necessitated sections be rebuilt
- Federal Mitigation Land in the area
 - post flood response was a combination of MRRP and emergency levee repair
- “Highway-2” Setback
 - North Setback
 - ~4 miles long
- “Frazers Bend” Setback
 - North Setback
 - ~3 miles long



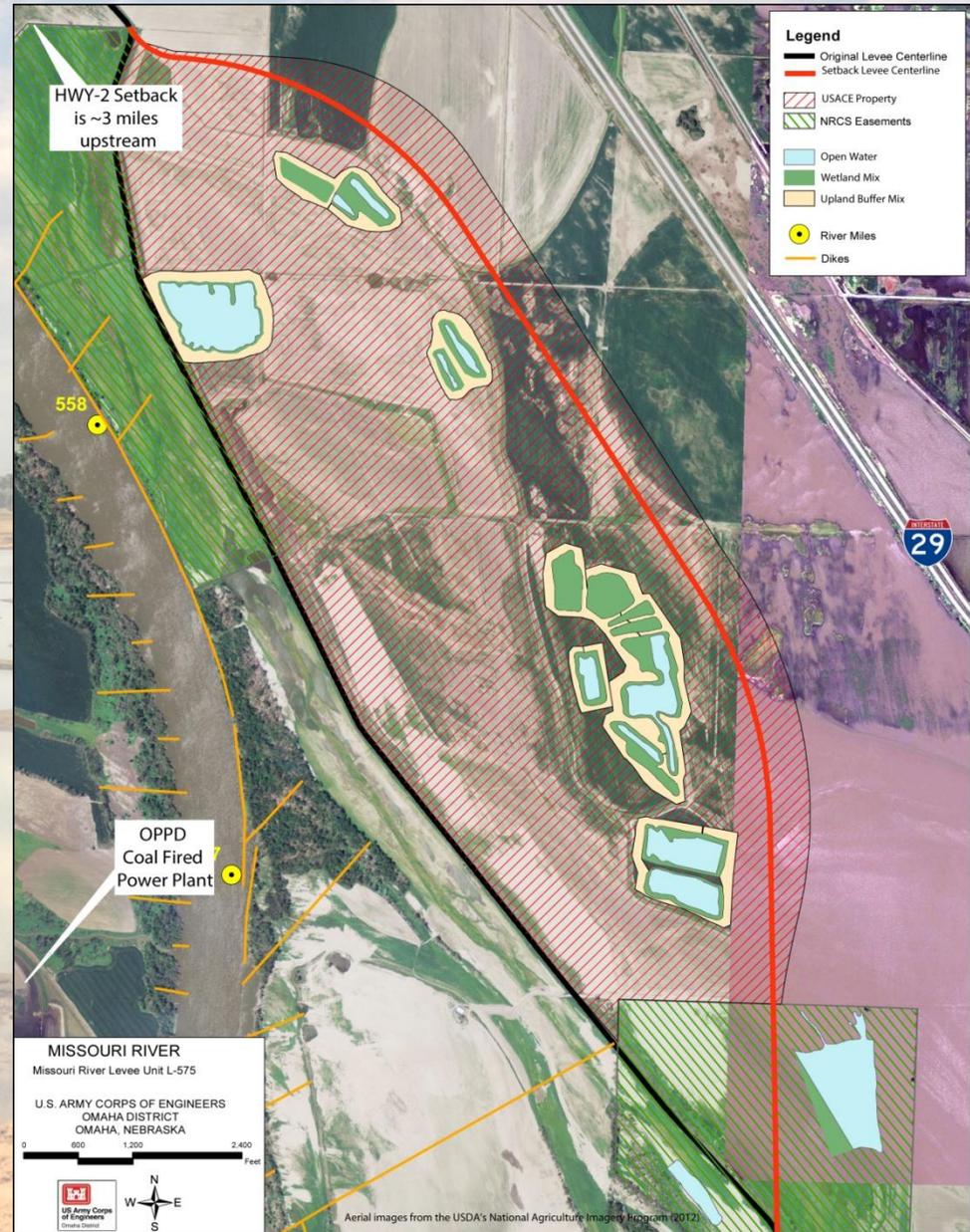
Highway 2 Setback

- Approx 760 acres of floodplain reconnected (MRRP Lands)
- Up to 1.5 feet flood stage reduction of 100-year event
- Up to 5.5 feet/second reduction of 100-year flood water velocity
- Levee was setback up to .5 miles
- Approx 200 acres of borrow pits treated for wetland establishment
- Eliminated the most constricted point on Missouri River mainstem



Frazers Bend Setback

- Approx. 970 acres of floodplain reconnected
- Up to 1.4 feet flood stage reduction of 100-year event
- Up to 1.4 feet/ second reduction of 100-year flood water velocity
-
- Levee was setback up to .7 miles
- Approx 120 acres of borrow pits treated for wetland establishment
- Will help OPPD Power Plant experience less powerful erosive flows during times of high water



Borrow Pits Treated for Wetland Establishment



Adding depth diversity and irregular shorelines



Shaping gentle side slopes



Adding wood debris habitat features



Planting hydrophytic vegetation



A Multiagency Effort



Fremont County Staff- hosted monthly coordination meetings.



Iowa Department of Natural Resources- consulted with on borrow pit wetland grading and seeding; IDNR will serve as land manager at the MRRP Mitigation sites.



Iowa Department of Transportation- coordinated construction of setback levee around HWY-2, agreed to construct ultimate alignment



Natural Resources Conservation Service- coordinated to ensure construction activities were compatible with land use requirements on NRCS's wetland easement tracts



U.S. Fish and Wildlife Service- consulted with regarding listed species and Migratory Bird Treaty Act compliance during construction

Local Landowners and Project Sponsors- participated in levee construction and seeding inspections, were coordinated with throughout construction

Several Other Entities were coordinated with during the NEPA process, including local, state, Tribal, and federal governments

Frazers Bend Setback During Construction

OLD LEVEE



NEW SETBACK
LEVEL



BORROW PIT



Unforeseen Challenges - Lessons Learned

Interagency Coordination:

- All agencies committed to working for success
- Needed to work details regarding authority and funding

Difficulty Managing Emergency Construction Contracts:

- Rapid pace of emergency construction
- Designs finalized as construction occurred

Existing Infrastructure:

- Power line considerations at Frazer bend setback
- Road abandonment at HWY-2 setback

Old Levee Degradation: (Safety)

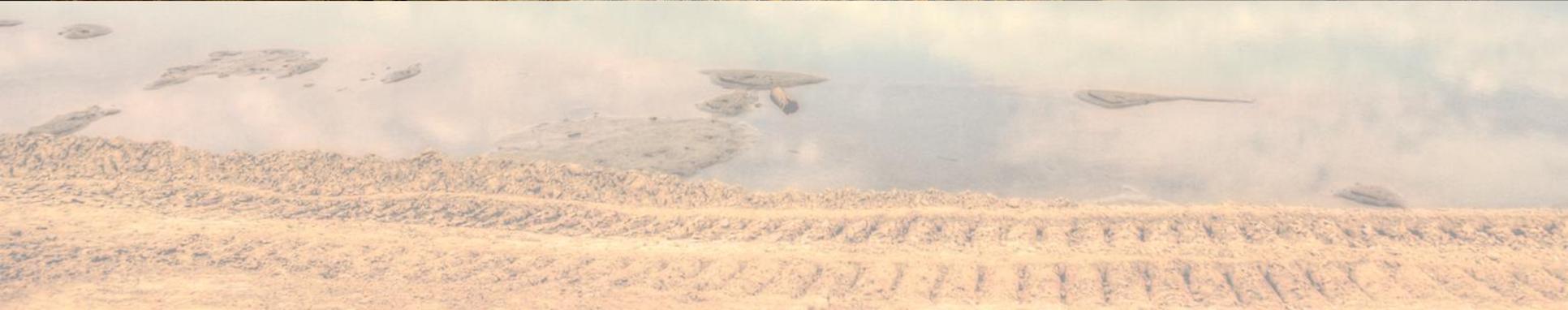
- Setback levees built to 25-year flood protection before using old levee material
- Uses of existing levee material

Real Estate Considerations:

- Construction compatibility with NRCS easements
- Expedited real estate acquisition process for Frazers Bend



Post Construction





CHART





Future Actions

Exploring options to do targeted levee setbacks to benefit:

- Flood risk reduction
- Endangered species recovery
- Other native species and natural habitat benefits

Compensatory wetland mitigation monitoring:

- USACE monitor sites until successful
- Majority of land treated for wetland mitigation is on federal land



Questions?

