

# ***Fargo-Moorhead Metropolitan Feasibility Study***

*Presentation for the Public*

*June 9-10, 2010*



US Army Corps of Engineers  
**BUILDING STRONG®**



## ***Presentation Overview:***

- ✓ Why We are Here
- ✓ Purpose and Scope
- ✓ Existing Conditions
- ✓ Alternatives Considered
- ✓ Screening Results
- ✓ Impacts
- ✓ Tentatively Selected Plan
- ✓ Schedule

***Why we are here:***

- ✓ To present the findings and information contained in the draft Fargo-Moorhead Metropolitan Area Feasibility Report and Environmental Impact Statement
- ✓ Gather public comments on the draft report and its contents.



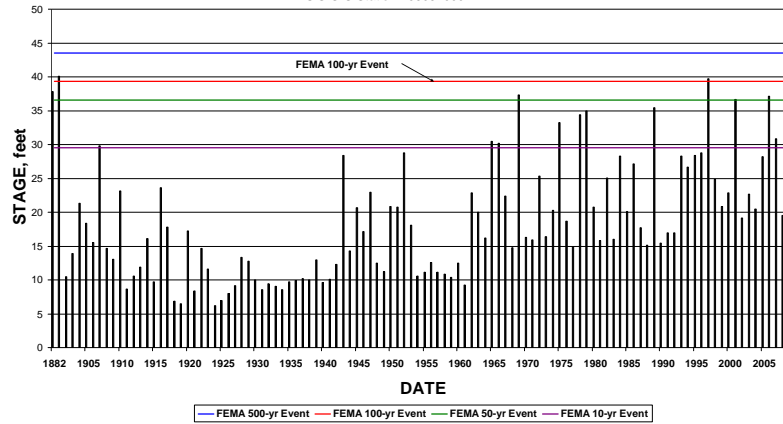
Fargo-Moorhead Flood 2009

***Purpose and Scope:***

- ✓ Reduce flood risk and flood damages in the Fargo-Moorhead metropolitan area.
- ✓ Restore or improve degraded riverine and riparian habitat in and along the Red River of the North, Wild Rice River (North Dakota), Sheyenne River (North Dakota), and Buffalo River (Minnesota) in conjunction with other flood risk management features.
- ✓ Provide additional wetland habitat in conjunction with other flood risk management features.
- ✓ Provide recreational opportunities in conjunction with other flood risk management features.

## Existing Conditions

Annual Peak Stages  
U.S.G.S Station - 05054000



\*Hydrologic record shows two periods: wet and dry

## Existing Conditions

- ✓ Panel of experts met to discuss hydrology
  - ✓ Confirmed increasing trend in flood flow and frequency
  - ✓ Currently in a wet cycle but will eventually switch to dry cycle
- ✓ Recommendations
  - ✓ Use non-standard hydrologic method to estimate future flows
  - ✓ Assume that continued wet conditions are more likely than dry
- ✓ Actions taken
  - ✓ Corps developed modified flow/frequency curves

### **Alternatives Considered:**

- ✓ No Action: Continue Emergency Measures
- ✓ Nonstructural Measures
  - ✓ Buyouts, Relocations and Elevate
- ✓ Increase Conveyance
  - ✓ Diversion Channels
- ✓ Flood Barriers
  - ✓ Levees/Floodwalls
- ✓ Flood Storage
  - ✓ Large/Small



### **Screening Results:**

- ✓ Diversion channels with tie back levees
  - ✓ Minnesota
  - ✓ North Dakota



**North Dakota  
alignment:**

- ✓ 30K and 35K cfs
- ✓ 36 mile-long channel
- ✓ 3.3 miles of tie back levee
- ✓ 8.5 years construction
- ✓ Structures needed
  - ✓ 2 Control structures
  - ✓ 2 River aqueducts
  - ✓ 2 Tributary drop structures
  - ✓ 3 Drop structures
  - ✓ 18 Highway bridges
  - ✓ 4 Railroad bridges

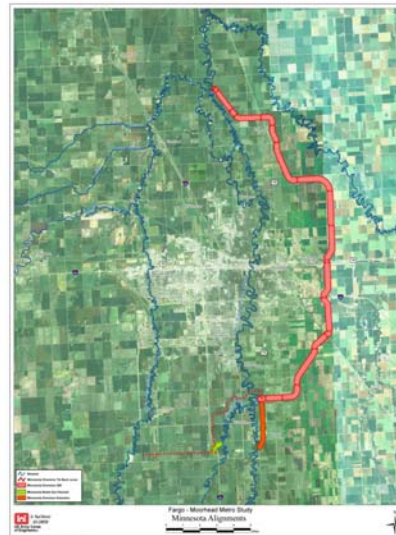


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**Minnesota  
alignment:**

- ✓ 20, 25, 30, 35, 40, and 45K cfs
- ✓ 25 mile-long channel
- ✓ 9.9 miles of tie back levee
- ✓ 7.5 years construction
- ✓ Structures needed
  - ✓ 1 Control structure
  - ✓ 1 Drop structure
  - ✓ 0 River crossings
  - ✓ 20 Highway bridges
  - ✓ 4 Railroad bridges



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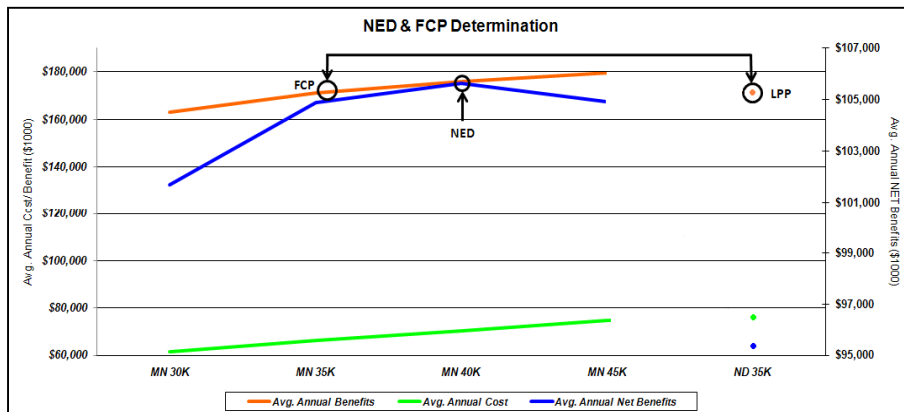
### Screening Results:

Screened Alternatives Ranked by Net Benefits

Alternative	Cost <sup>1</sup>	Avg Annual Net Benefits <sup>1</sup>	Avg Annual Benefits <sup>1</sup>	Residual Damages <sup>1</sup>	B/C Ratio
MN Short Diversion 20K	\$1,032	\$87.0	\$140.0	\$55.9	2.64
MN Short Diversion 25K	\$1,121	\$98.8	\$156.4	\$39.5	2.71
MN Short Diversion 30K	\$1,194	\$101.7	\$163.1	\$32.8	2.66
MN Short Diversion 35K	\$1,286	\$104.9	\$171.0	\$24.9	2.59
MN Short Diversion 40K <sup>2</sup>	\$1,367	\$105.6	\$175.9	\$20.0	2.50
MN Short Diversion 45K <sup>2</sup>	\$1,450	\$104.9	\$179.5	\$16.4	2.41
ND East Diversion 35K	\$1,462	\$95.4	\$171.1	\$24.8	2.26

1. In millions of dollars with interest during construction and discounting included  
 2. Estimate based on linear extrapolation  
 Expected average annual damages without a project are \$195.9 million.

### National Economic Development (NED) Locally Preferred Plan (LPP) Federally Comparable Plan (FCP):



**Effectiveness of Diversions:**

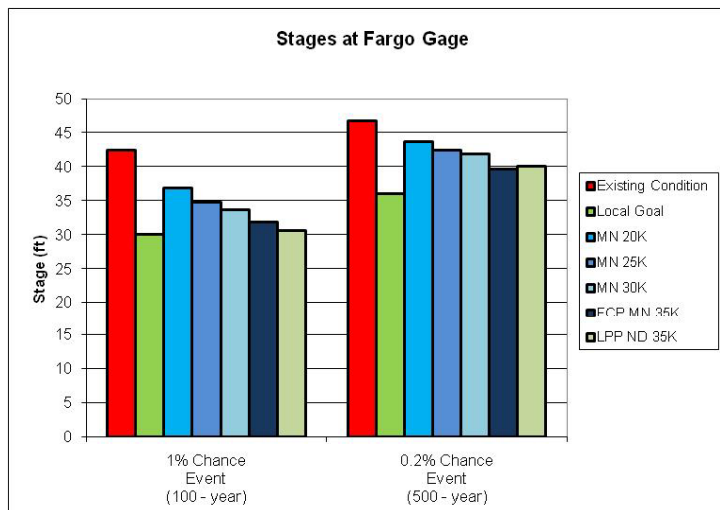
	Stage at Fargo Gage (ft)	
	1% Chance (100- year)	0.2% Chance (500- year)
Existing Condition (Stage)	42.4	46.7
Existing Condition (CFS)	34,700	61,700
Work Group Goal	30	36
20K MN Diversion Channel	36.9	43.7
25K MN Diversion Channel	34.8	42.4
30K MN Diversion Channel	33.6	41.9
35K ND Diversion Channel	30.6	40
35K MN Diversion Channel	31.9	39.6
40K MN Diversion Channel	31.9	37.6
45K MN Diversion Channel	31.9	35.3



Fargo, N.D., March 26, 2009

Stage	Impacts
27	Fargo Elm Street closed
30	Fargo 2nd Street Dike installed
31	Moorhead 1st Ave. North closed
32	First homes in Moorhead threatened
35	First homes in Fargo threatened
40.8	2009 Flood Record Stage

**Effectiveness of Diversions:**



**Downstream Effects:**

Based on 35K diversions and 100-year event

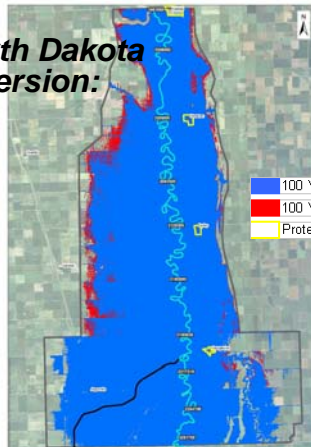
Location	Stage increase (inches)
<b>Minnesota Short 35K - 100 Year</b>	
Halstad Gage	6.7
Peak	7.2
Hendrum	6.8
Perley	4.8
Georgetown	4.7
<b>North Dakota 35K - 100 Year</b>	
Halstad Gage	10.7
Peak	11.6
Hendrum	10.7
Perley	6.6
Georgetown	7.1

\* Impacts downstream of Halstad still being assessed.

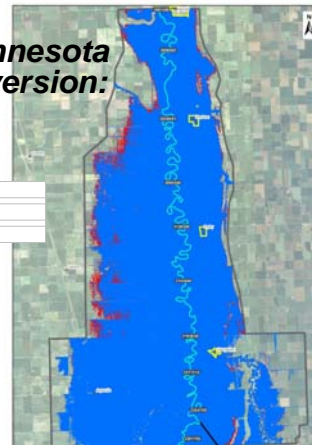
**Downstream effects:**

Based on 35K diversions and 100-year event

**North Dakota Diversion:**



**Minnesota Diversion:**



**Project Impacts (ND 35k):**

- ✓ **Wetlands** - 33 acres direct impacts and 193 acres of indirect impacts
- ✓ **Groundwater** - No adverse impacts
- ✓ **Sedimentation** – Minor impacts on Red River and tributaries
- ✓ **Connectivity** – Impacts minimized up to the 2-percent chance event
- ✓ **Riparian and Aquatic Habitat** – 43 acres of river channel and 140 acres of riparian forest
- ✓ **Residences** – Relocation of six residences
- ✓ **Farmland** – 5,400 acres of prime and unique farmland

The project includes appropriate mitigation for unavoidable environmental impacts.

**Recreation:**

- ✓ **Conceptual Plan**
  - ✓ 48-miles of trails
  - ✓ Benches every two miles
  - ✓ 2 – Shared-use bridges
  - ✓ 2 – Pedestrian-only bridges over diversion
  - ✓ 3 – Trail heads
  - ✓ Rest rooms
  - ✓ Potable water
  - ✓ Picnic facilities
  - ✓ Trees and Shrubs
- ✓ **Average Annual Benefits – \$13,147,000**





**Locally Preferred Plan :**

- ✓ Identification of Locally Preferred Plan (LPP)
  - ✓ The Local sponsor identified the ND 35k diversion channel as the LPP, and reaffirmed their commitment on May 26, 2010.
  - ✓ Waiver obtained from Assistant Secretary of the Army for Civil Works

**Tentatively Selected Plan:**

- ✓ The North Dakota 35k diversion channel is the tentatively selected plan.



**Cost Sharing:**

- ✓ Cost Sharing with LPP
  - ✓ Federal funds capped at 65% of the Federally Comparable Plan (FCP)
  - ✓ All costs in excess of the FCP are 100% local responsibility



Main Street Bridge

ND 35,000 cfs Diversion First Costs			
Item	Federal (\$)	Non-Federal (\$)	Total (\$)
Flood Risk Management	693.3	544.1	1,237.4
Recreation	17.4	17.4	34.8
<b>Total Project</b>	<b>710.7</b>	<b>561.5</b>	<b>1,272.2</b>
All costs in millions (\$1,000,000)			

***Local Decisions and Tasks:***

- ✓ Identify sponsors for construction and ongoing operations and maintenance
- ✓ Define non-federal cost sharing arrangements
- ✓ Provide letter supporting the project by July 15, 2010
- ✓ Prepare to execute design agreement and provide funding – October 2010

***Path Forward:***

- ✓ Continue survey work
- ✓ Quantify downstream impacts
- ✓ Develop recreation plan
- ✓ Continue working with natural resources agencies
- ✓ Resolve any issues generated by public and agency reviews



Red River of the North

### ***F-M Metro Study Timeline:***

- ✓ Jul 2010: Independent External Peer Review Complete
- ✓ Jul 26, 2010: Public Review Period Complete
- ✓ Sep 2010: Civil Works Review Board Briefing in Washington DC
- ✓ Sep 2010: Finalize feasibility report/EIS
- ✓ Oct 2010: Public Meetings
- ✓ Dec 2010: Transmit recommendation to Congress
- ✓ Jan 2011: Begin plans and specifications
- ✓ Apr 2012: Begin construction

### ***Provide Formal Comments on the Draft Feasibility Report and Environmental Impact Statement:***

- ✓ Comment period ends on July 26, 2010.
- ✓ Web site: <http://www.internationalwaterinstitute.org/feasibility>
- ✓ Mail:
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