



CITY OF Fargo  **CITY OF MOORHEAD MINNESOTA**

Why We Are Here

- ✓ Fargo-Moorhead area has significant flood risk
- ✓ Provide the public with information on the alternatives considered, initial results, and the path forward.
- ✓ We need local consensus on the path forward.



Fargo-Moorhead Flood 2009

19 October 2009 2

Funding and Costs

- ✓ Study costs are shared 50% federal, 50% non-federal
- ✓ Congress provides federal funds to the Corps
- ✓ Non-federal funding is provided by:
 - ✓ City of Fargo, ND
 - ✓ City of Moorhead, MN
 - ✓ Buffalo-Red River Watershed District, MN
 - ✓ Cass County, ND
- ✓ Estimated study cost: \$6,400,000
- ✓ Construction costs are shared 65% fed, 35% non-fed

Study Goals

- ✓ Develop a system to reduce regional flood risk
- ✓ Determine the Federal role in implementation
- ✓ Document findings in a Feasibility Report
- ✓ Recommend a project to Congress



Study Area

- ✓ Fargo-Moorhead metropolitan & surrounding area
- ✓ North: Harwood, ND & Kragens, MN
- ✓ South: Oxbow, ND
- ✓ East: Dilworth, MN
- ✓ West: West Fargo, ND



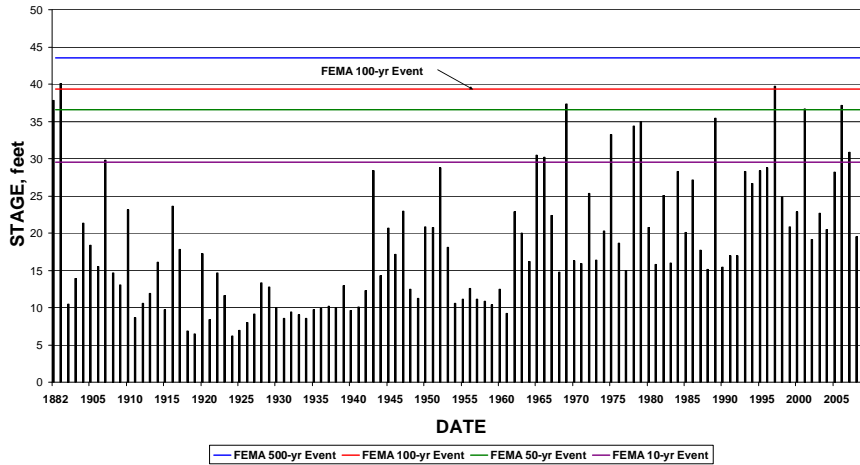
Risk

- ✓ The 2009 flood was approximately a 125 year flood event.
- ✓ Successful flood fights lead to a false sense of security.
- ✓ It would be very difficult to fight floods larger than the 2009 flood.
- ✓ Failure of emergency levees would be catastrophic.



Building of 2nd St. Levee for 2009 Fargo-Moorhead Flood

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



- ✓ 2009 flood in Fargo-Moorhead was approximately a FEMA 125-year (0.8% chance) flood.

Alternatives

- ✓ No Action: Continue Emergency Measures
- ✓ Nonstructural measures
 - ✓ Buy and relocate flood-prone structures
 - ✓ Flood proofing
 - ✓ Elevate structures
 - ✓ Flood warning systems
 - ✓ Flood insurance
 - ✓ Wetlands
 - ✓ Grasslands



Alternatives

- ✓ Increase conveyance
 - ✓ Diversion channels around the study area
 - ✓ In Minnesota
 - ✓ In North Dakota
 - ✓ Underground tunnels
 - ✓ Interstate 29 viaduct
 - ✓ Increase conveyance in Oakport Coulee
 - ✓ Cutoff channels (to short-cut existing meanders)
 - ✓ Flattening the slopes on river bank
 - ✓ Dredge river deeper and wider
 - ✓ Replacing bridges



Alternatives

- ✓ Flood barriers
 - ✓ Levees
 - ✓ Floodwalls
 - ✓ Invisible floodwalls
 - ✓ Gate closures
 - ✓ Pump stations
- ✓ Flood storage
 - ✓ Large dams upstream
 - ✓ Distributed storage
 - ✓ Controlled field runoff
 - ✓ Storage ponds, also used for water conservation



Floodwall at Grand Forks



Initial Screening Criteria

- ✓ **Effectiveness:** Ability to provide acceptable level of flood risk management
- ✓ **Environmental Effects:** Effects on natural and cultural resources
- ✓ **Social Effects:** Effects on socio-economic resources
- ✓ **Acceptability:** Controversy and potential effects on community
- ✓ **Implementability:** Technical, social, legal or institutional issues
- ✓ **Cost:** The first cost of the project and operations and maintenance.
- ✓ **Risk:** The uncertainties surrounding the project
- ✓ **Separable Mitigation:** Is separable mitigation required and what is the cost
- ✓ **Cost Effectiveness:** Comparison of benefits and costs



Initial Screening Results

- ✓ No Action: Continue Emergency Measures
- ✓ Diversion Channels
 - ✓ Minnesota
 - ✓ North Dakota
- ✓ Levees



Detailed Analysis

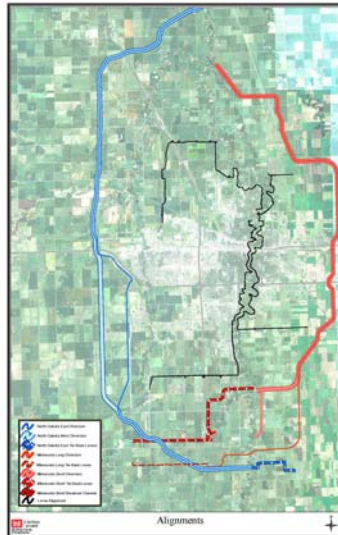
✓ Completed Detailed Analysis

- ✓ MN Diversions
 - ✓ 6 separate plans (2 alignments & 3 capacities: 25,000, 35,000, and 45,000 cfs)

- ✓ ND Diversions
 - ✓ 3 separate plans (ND West 35,000 & 45,000 and ND East 35,000 cfs capacity)

- ✓ Levee Alternative
 - ✓ 2 separate plans [2% chance (50-year) and 1% chance (100-year)]

- ✓ Non-Structural Alternatives
 - ✓ 3 separate plans (100, 200, and 500-year)



Preliminary Results

| Alternative | Cost * | Net Benefits * | B/C Ratio |
|-----------------------------------|------------------|----------------|-------------|
| Levee 2% chance (50-year) | 840,000 | -5,330 | 0.88 |
| Levee 1% chance (100-year) | 902,000 | 7,673 | 1.17 |
| MN Long Diversion 25K | 1,055,000 | 5,596 | 1.10 |
| MN Long Diversion 35K | 1,260,000 | 266 | 1.00 |
| MN Long Diversion 45K | 1,459,000 | -8,283 | 0.89 |
| MN Short Diversion 25K | 962,000 | 11,025 | 1.22 |
| MN Short Diversion 35K | 1,092,000 | 9,424 | 1.17 |
| MN Short Diversion 45K | 1,264,000 | 2,501 | 1.04 |
| ND East Diversion 35K | 1,337,000 | -3,108 | 0.95 |
| ND West Diversion 35K | 1,363,000 | -4,426 | 0.94 |
| ND West Diversion 45K | 1,439,000 | -6,718 | 0.91 |

* In thousands of dollars

Path Forward

✓ Uncertainties:

- ✓ Natural Resource impacts (fish passage – greater for ND diversion alignments)
 - ✓ Mitigation costs not accounted
- ✓ Additional project benefits – ND diversion provides benefits from other rivers
- ✓ Impacts to upstream/downstream landowners
 - ✓ Known levee impacts, not accounted
 - ✓ Unknown diversion impacts, not accounted

✓ Upcoming Tasks

- ✓ Develop additional benefit information
- ✓ Develop costs for any negative impacts
- ✓ Develop additional capacity alternatives
- ✓ Refine alignments



Path Forward

- ✓ **Recommend further analysis of:**
 - ✓ **Minnesota Short Diversion Alignments**
 - ✓ Develop new 20K, 30K, 40K capacities
 - ✓ Update 25K & 35K capacities with new hydrology
 - ✓ Optimize
 - ✓ **North Dakota East Alignment**
 - ✓ Determine extra benefits from tributary floods
 - ✓ Depending on extra benefits decide with sponsors on path forward
 - ✓ **Levee Alignments**
 - ✓ Develop additional levee profiles – 1.5% chance (75-year)



F-M METRO STUDY TIMELINE

- ✓ **Jan 2010:** Identify tentatively selected plan
- ✓ **Jan 2010:** Public Meeting
- ✓ **Mar 2010:** Independent External Peer Review
- ✓ **May 2010:** Formal Public Review of Feasibility Report
- ✓ **Sep 2010:** Finalize feasibility report
- ✓ **Dec 2010:** Transmit recommendation to Congress
- ✓ **Jan 2011:** Begin Plans and Specifications
- ✓ **Apr 2012:** Begin Construction



Local Decision Makers

- ✓ **Review Questions/Decisions Handout**
 - ✓ Develop local consensus
 - ✓ Identify a Locally Preferred Plan – if desired
 - ✓ Who will be sponsors during construction?
 - ✓ How will this be paid for?
 - ✓ Local share will be 35-50% of costs



Contact Information

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