

Partners

- ✓ Corps of Engineers
- ✓ City of Fargo
- ✓ City of Moorhead
- ✓ Metropolitan Flood Management Committee

20-21 October 2009 2



Format for Meeting

- ✓ **Open House**
- ✓ **Please sign in and pick up handouts**
 - ✓ Indicate if you'd like to be added to the mailing list
- ✓ **Slide Presentation**
- ✓ **Question & Answer Period**
- ✓ **Open House**



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 want public participation in the process**



Fargo-Moorhead Flood 2009



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



Planning Process

1. Specify problems and opportunities.
2. Inventory and forecast conditions.
3. Formulate alternative plans.
4. Evaluate effects of alternative plans.
5. Compare alternative plans.
6. Select recommended plan.



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.

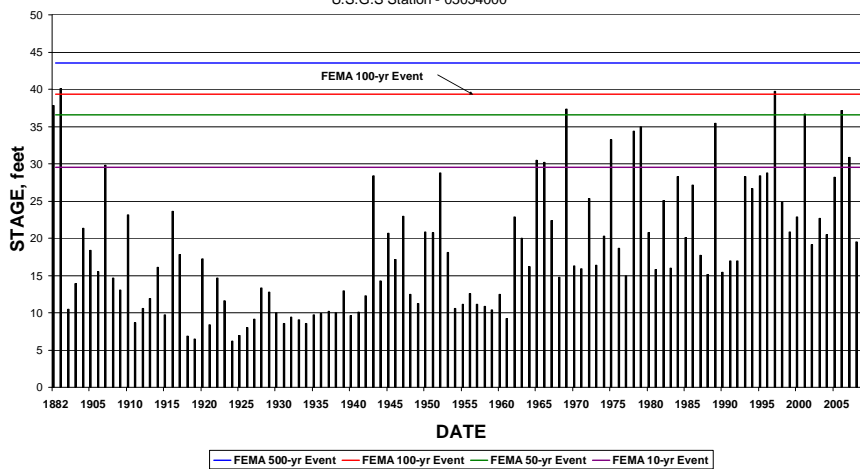


Building of 2nd St. Levee for 2009 Fargo-Moorhead Flood



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

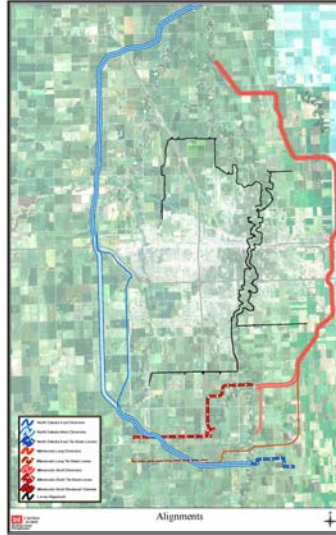
Initial Screening Results

- ✓ 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

NEXT STEPS

- ✓ **Seek public input on initial screenings and results**
 - ✓ Deadline of November 23, 2009
- ✓ **Refine remaining alternatives**
 - ✓ Assess costs and benefits of alternatives
 - ✓ Economic, Social, and Environmental
- ✓ **Final screening**
 - ✓ Develop one plan that will be the tentatively selected plan
- ✓ **Seek public input on tentatively selected plan**



CONTACT US

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QUESTIONS or COMMENTS?

- ✓ Please come to the podium so everyone can hear.