The background of the slide is a close-up of the American flag, showing the stars and stripes. In the lower right quadrant, there is a small, golden sandcastle on a patch of white sand.

Fargo-Moorhead Metropolitan Feasibility Study

***Presentation
for***

PUBLIC MEETINGS

May 19-20, 2009



INTRODUCTIONS

- ✓ **City of Fargo**
- ✓ **City of Moorhead**
- ✓ **Corps of Engineers Team Members**



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'RE HERE

- ✓ **Fargo-Moorhead area has significant flood risk**
- ✓ **Further study is warranted for a permanent federal project.**
- ✓ **We want public participation in the process**



Fargo-Moorhead Flood 2009



WHO PAYS FOR THIS?

- ✓ 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
- ✓ Estimated study cost: \$5,318,000
- ✓ Construction costs are shared 65% fed, 35% non-fed



Role of the Corps of Engineers

- ✓ **Lead feasibility study effort.**
- ✓ **Identify the plan that provides the most benefits for the nation.**
- ✓ **Comply with all laws and regulations.**
- ✓ **Consider the views of all stakeholders.**
- ✓ **Pay half of the feasibility study costs.**



Fargo/Moorhead Role

- ✓ Full partners in the study team.
- ✓ Develop local consensus.
- ✓ Assist with plan development.
- ✓ Identify local issues.
- ✓ Pay half of the feasibility study costs.



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

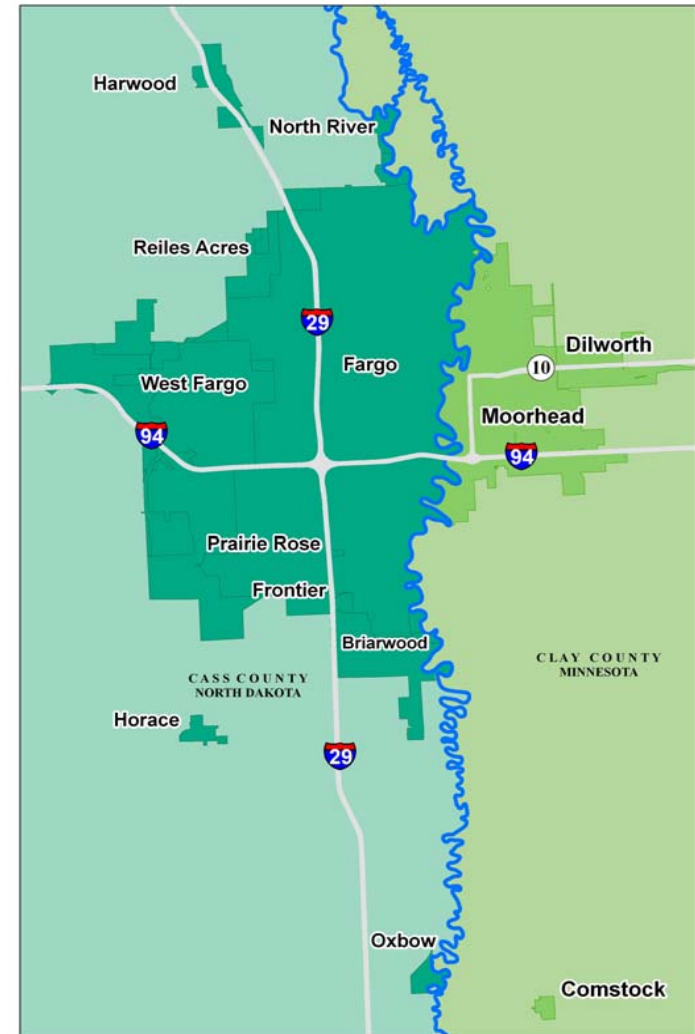
- ✓ **Develop a system to reduce regional flood risk**
- ✓ **Determine the Federal role in implementation**
- ✓ **Document findings in a Feasibility Report**
- ✓ **Recommend a project to Congress**



STUDY AREA

✓ **Fargo-Moorhead metropolitan & surrounding area**

- ✓ **North: Harwood, ND & Kragnes, MN**
- ✓ **South: Oxbow, ND**
- ✓ **East: Dilworth, MN**
- ✓ **West: West Fargo, ND**



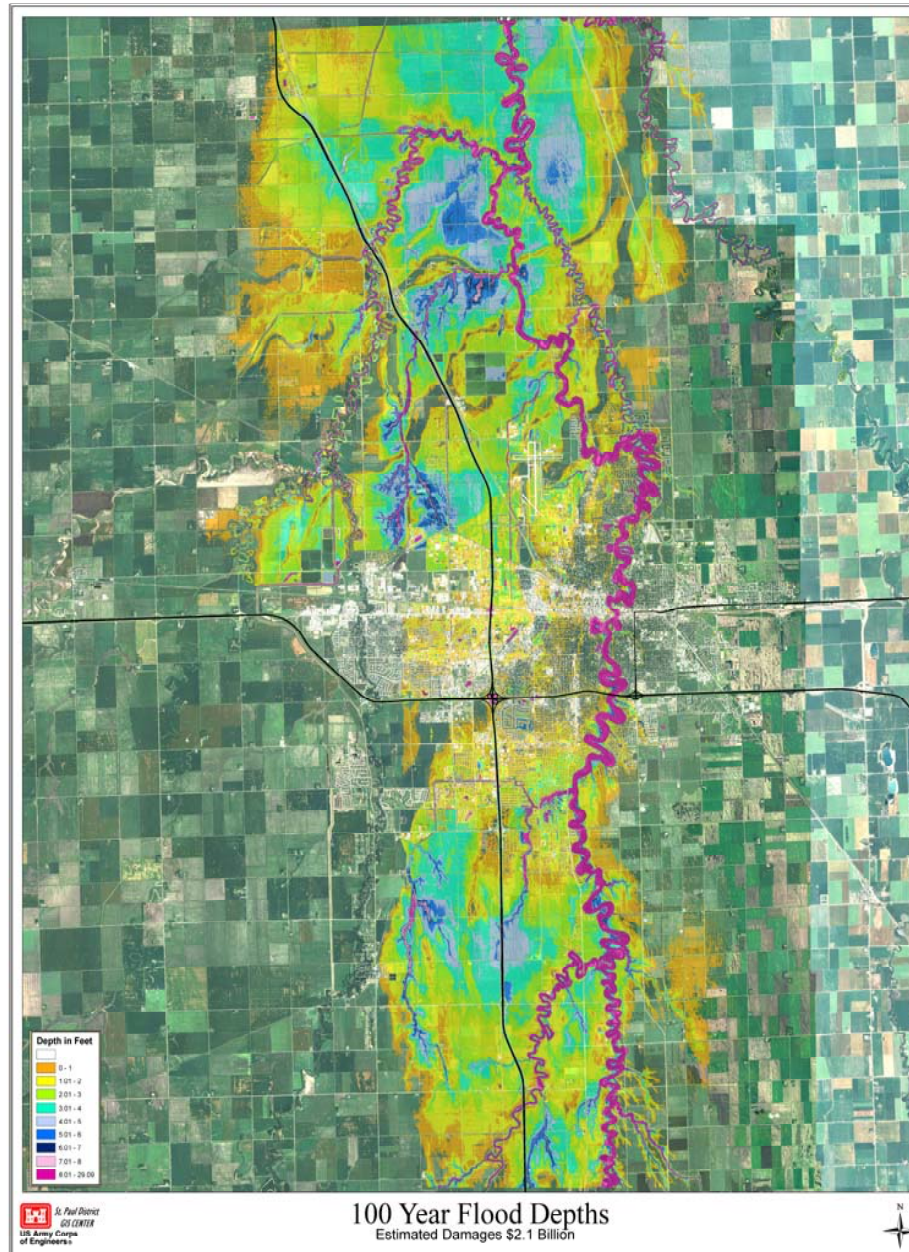


Risk

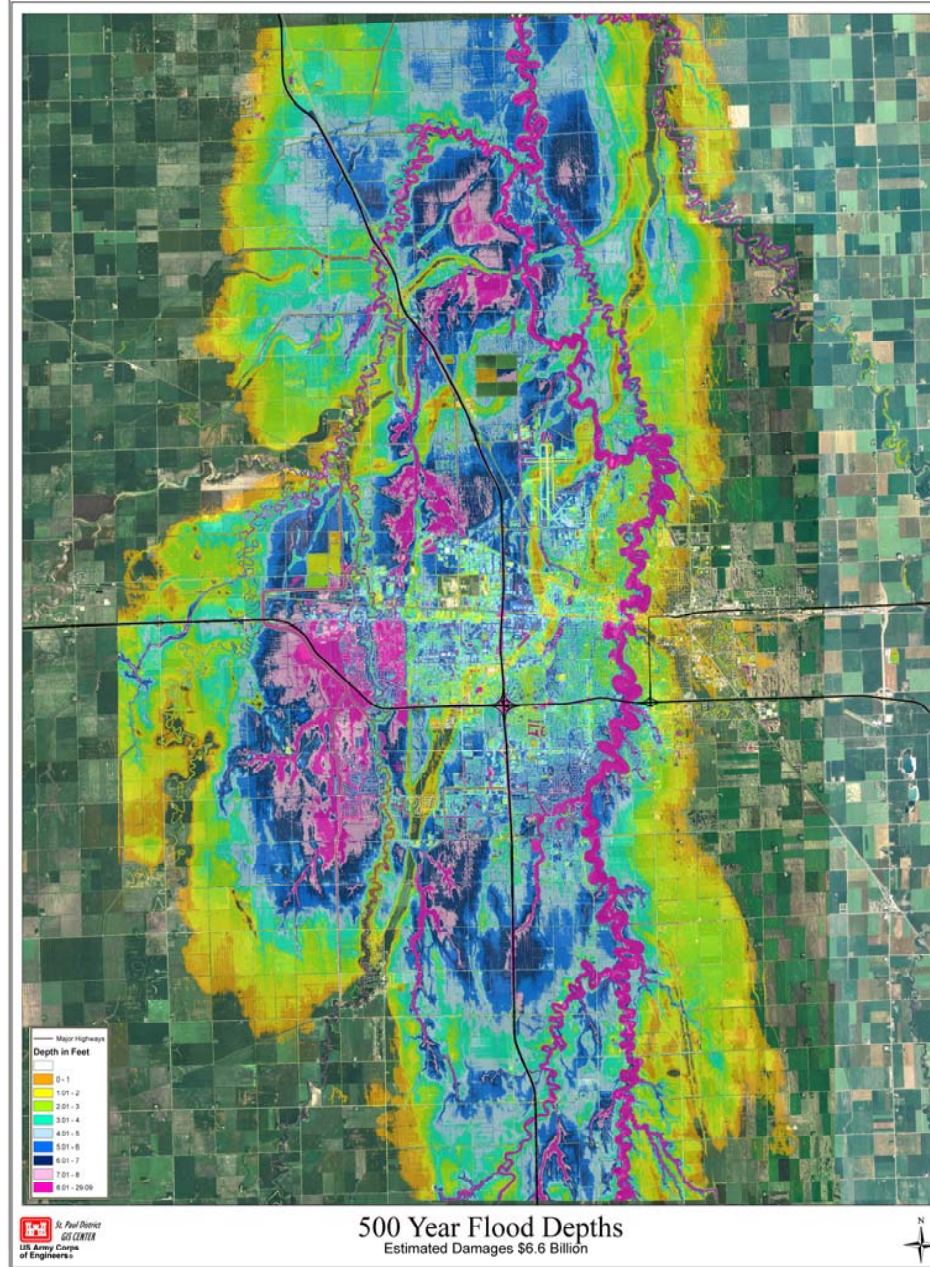
- ✓ The 2009 flood was approximately a 125 year flood event.
- ✓ Successful flood fights lead to a false sense of security.
- ✓ It would be very difficult to fight floods larger than the 2009 flood.
- ✓ Failure of emergency levees would be catastrophic.



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



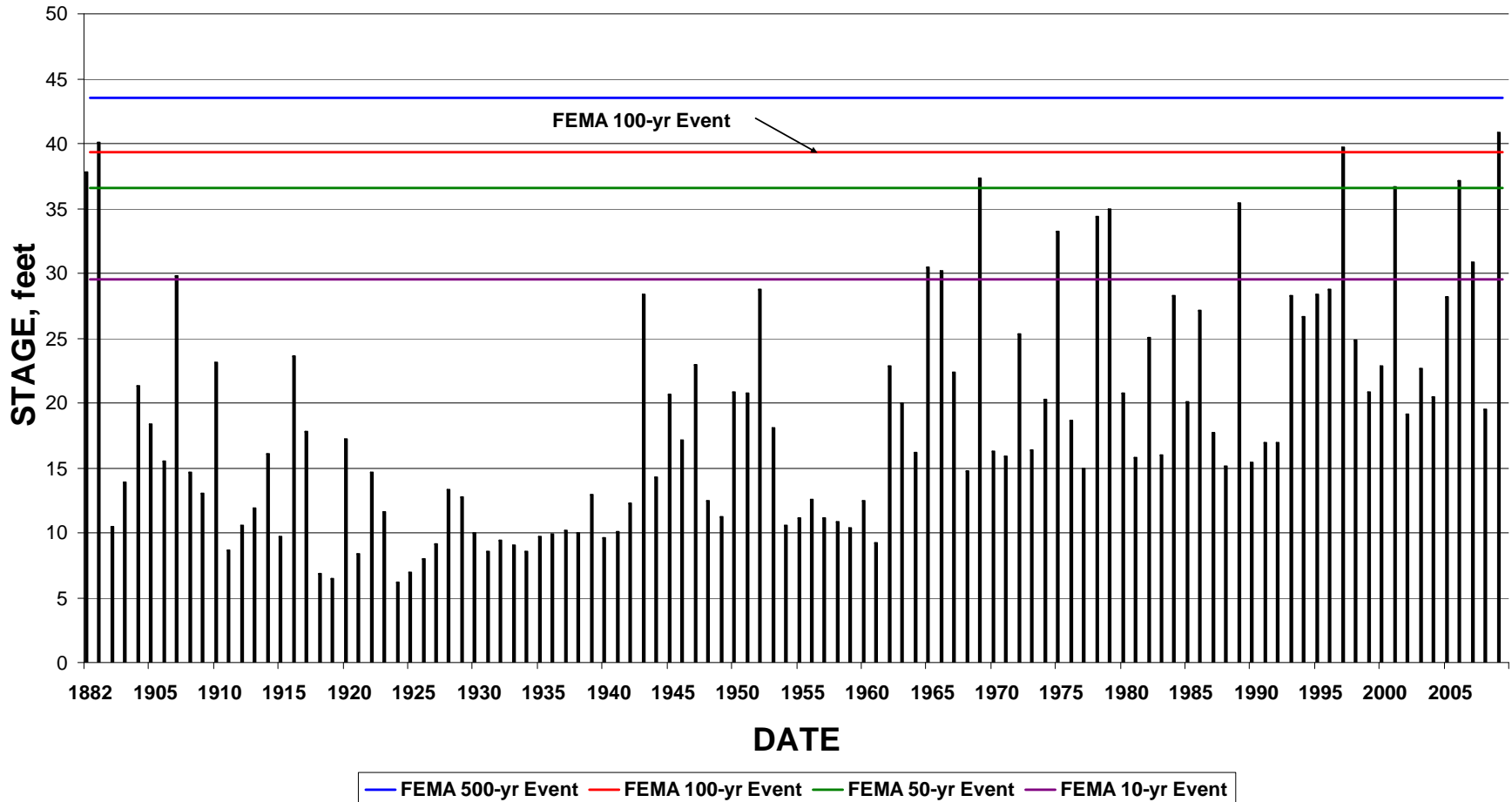
Potential Depths of Inundation



Potential Depths of Inundation

Annual Peak Stages

U.S.G.S Station - 05054000



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



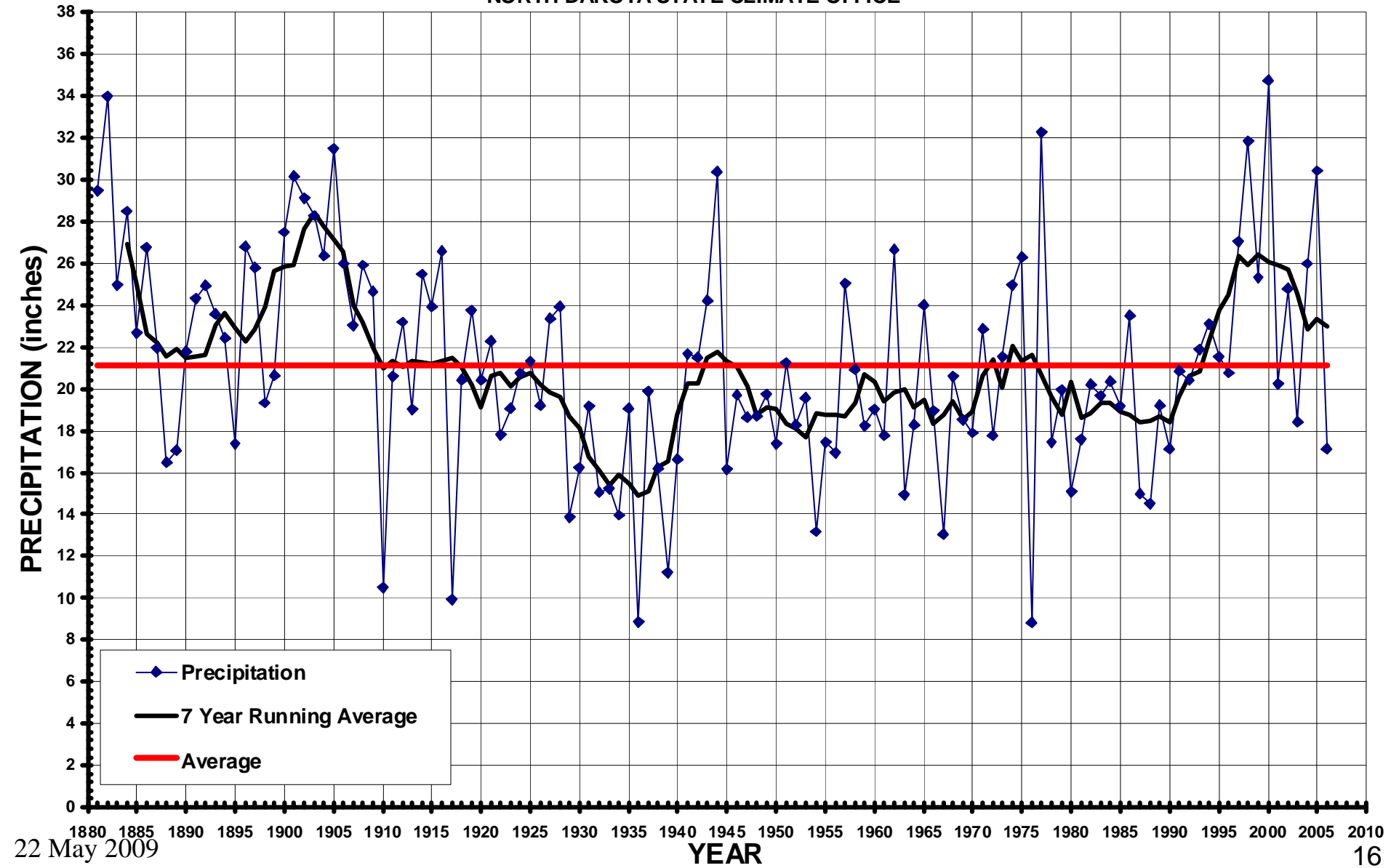
Flood Risk

*During the life of a 30-year mortgage,
the odds of having a Red River flood
larger than the 2009 flood
are about
1 in 5.*





FARGO ANNUAL PRECIPITATION NORTH DAKOTA STATE CLIMATE OFFICE





Flood Risk

- ✓ Rain events cause flooding, too:
 - ✓ 7-inch rain June 20, 2000
 - ✓ Flood insurance can help mitigate that risk.



2nd St. North, Fargo



12th Ave. Toll Bridge

Level of Protection

- ✓ Design levels of protection in other Red River cities:
 - ✓ Wahpeton-Breckenridge: >100-year
 - ✓ Grand Forks-East Grand Forks: 250-year
 - ✓ Pembina, ND: >100-year
 - ✓ Winnipeg, MB: 700-year
- ✓ The objective of this project is to provide a high level of protection to the Fargo-Moorhead metropolitan area.



Levee at Grand Forks, ND

Other Projects

- ✓ **Fargo-Ridgewood**
- ✓ **Oakport**
- ✓ **Fargo Southside
Flood Control**



Oakport Area - 2009

ALTERNATIVES

- ✓ No Action - Continue Emergency Measures
- ✓ Non-Structural Flood Proofing
- ✓ Flood Barriers
 - ✓ Levees/Floodwalls
 - ✓ Gate Closures
 - ✓ Pump Stations
- ✓ Increase Conveyance
 - ✓ Diversion Channels
 - ✓ Cutoff Channels
 - ✓ Replacing Bridges
- ✓ Flood Storage



Floodwall at Grand Forks

Non- Structural Flood Proofing

- ✓ Relocation of Structures in Flood Plain
- ✓ Buyout and Demolition of Structures
- ✓ Raising of Structures



Home Relocation in Grand Forks, ND



Building Demolition in Grand Forks, ND

Flood Barriers

- ✓ Earthen Levees
- ✓ Flood Walls
- ✓ Pump Stations
- ✓ Gated Closures



Levee and Pump Station in Grand Forks



Floodwall at St. Anne's, Grand Forks

Diversion Channel

- ✓ Would re-route a portion of the flood water around Fargo – Moorhead.
- ✓ We will consider alternative alignments in both ND and MN.
- ✓ Preliminary analysis looked only at the shortest Minnesota diversion.



Water Storage

- ✓ Retain water upstream to decrease flood crests.
- ✓ Would not solve problem completely, but could be part of final solution.
- ✓ Could be implemented by state and local governments.



Lake Ashtabula, Valley City, ND



F-M Upstream Feasibility Study

- ✓ **Fargo-Moorhead Upstream Study was started in 2004 and is currently ongoing.**
- ✓ **Evaluating a system of water retention sites to restore wetlands and store flood waters.**
- ✓ **Potential system of 200,000 to 400,000 acre-feet of storage could reduce 100-year flood stage by 1.6 feet.**
- ✓ **Unlikely to be economically justified for Federal participation, but we are looking for ecosystem restoration opportunities.**



Phase I

- ✓ **Phase I – Completed April 2009**
- ✓ **Gathered existing information**
 - ✓ Environmental Resources
 - ✓ Social/Cultural Resources
 - ✓ Hydrologic/Hydraulic Conditions
 - ✓ Existing levees and flood reduction measures
- ✓ **Average Annual Damages - \$64,000,000**
 - ✓ Economic Surveys of Residences and Businesses in Fargo and Moorhead
 - ✓ Additional work in Phase II for other communities
 - ✓ Documentation of flood fight costs



Phase I

- ✓ **Levee Alternative First Cost - \$625,000,000**
 - ✓ 1% Levee for both Fargo and Moorhead
 - ✓ Includes Southside Project
- ✓ **East Diversion First Cost - \$910,000,000**
 - ✓ Approximately 20 feet deep, 500 foot bottom, total width of 2000 feet
 - ✓ Nearly 30 miles
 - ✓ Included 17 highway and 4 railroad bridges.



F-M METRO STUDY TIMELINE

- ✓ **Sept 2009: Alternative Screening**
- ✓ **Jan 2010: Identify tentatively recommended plan**
- ✓ **Sep 2010: Finalize feasibility report**
- ✓ **Dec 2010: Transmit recommendation to Congress**
- ✓ **Jan 2011: Begin Plans and Specifications**
- ✓ **April 2012: Begin Construction**



NEXT STEPS

- ✓ **Seek public input on measures**
 - ✓ Deadline of June 22, 2009
- ✓ **Develop array of alternative measures**
- ✓ **Assess costs and benefits of alternatives**
 - ✓ Economic, Social, and Environmental
- ✓ **Preliminary screening**
- ✓ **Seek public input on alternatives**



CONTACT US

- ✓ Information on back of handout
- ✓ Please sign our sheet to get future mailings.
- ✓ Website:
<http://www.internationalwaterinstitute.org/feasibility/index.htm>
- ✓ Phone numbers:
 - ✓ Kevin Bluhm 651-290-5247
 - ✓ Craig Evans 651-290-5594
 - ✓ Aaron Snyder 651-290-5489



QUESTIONS or COMMENTS?

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