

Moorhead, Minnesota



Photo Credit: FEMA, 2010. Evaluating Losses Avoided Through Acquisition: Moorhead, MN

Background

Moorhead is a midsize city (pop. 38,065) in Clay County, Minnesota. The largest city in the northwest of the state, Moorhead is bordered on the west by the Red River. Across the river lies the city of Fargo, North Dakota. The land around the Fargo and Moorhead area is among the flattest and most fertile in the world due to its location on the lakebed of glacial Lake Agassiz, which drained between 9,900 and 11,000 years ago.

Although agriculture is prominent in the area, Moorhead is also home to notable corporate, manufacturing and distribution industries. The unemployment rate in Moorhead is consistently below the national average and property values are stable in the area.

Figure 1: Location of Moorhead, Minnesota



History of Flooding and Mitigation

The City of Moorhead has experienced its fair share of flooding, given its location along the Red River. Flooding occurred in 1993, 1994, 1997, 2002, 2006, 2009, 2010 and 2011. In 1993, an unusual weather pattern generated drenching rains in the Northern Mississippi River valley. With already saturated soil from a large snow pack the previous winter, combined with a very rainy April, conditions were ripe for a major flood. Over Mother's Day weekend, heavy rainfall caused flooding that continued through much of the summer, causing widespread flooding in Minnesota.

Table 1: Moorhead Demographic Info

	Moorhead	Minnesota
--	----------	-----------

Population (2010)	38,065	5,303,925
Median age	28.3	37.4
Housing units	15,274	2,347,201
Owner occupied (%)	61.2	72.1
Black (%)	2.0	5.2
White (%)	90.7	85.3
Hispanic or Latino (%)	4.1	4.7
High school degree (%)	93.8	92.3
Bachelor's degree (%)	34.0	33.2
Median household income	\$49,514	\$60,828
Poverty rate	15.9	11.5

Source: US Census, 2010 and American Community Survey 2014

Table 1 compares demographics of the city to the state. Moorhead compares to the state for the factors of education and the percentage of Hispanics or Latinos. In contrast, population percentages of White and Black residents differ, as does the median age, median income, and poverty rates.

In 1997, heavy winter snow and ice accumulations, in addition to a rapid thaw in the spring, resulted in catastrophic flooding of the Red River. The river crested at 39.5 feet, flooding homes and businesses in the community. In following years, major flooding recurred in 2001, 2006, 2009 and 2010.

Flooding along the Red River

Photo credit: FEMA, 2010 Loss Avoidance Study

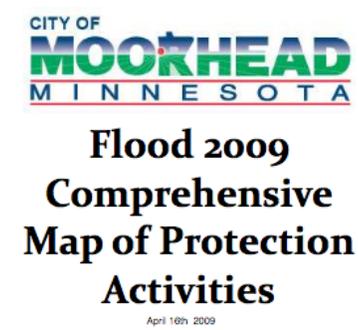


In 2006, the fifth highest flood on record hit the Moorhead area. This time damage from floodwaters along the Red River was minimal thanks to buyouts and a sandbag dike. Between 1994 - 2002, the city had acquired 26 homes along the river. Furthermore, in 2006, approximately 100 homeowners built dikes to the 38-foot flood height to protect their properties. The 2006 floods were, at the time, the fourth highest on

record. However, in 2009 the area experienced record flooding which reached a height of 40.84 feet. After years of annual community sandbagging efforts, Moorhead decided to pursue extensive buyouts. As a result, extensive areas along the river have been transferred from private property to public use, primarily for flood protection and recreation. Figure 2 shows the location of levees and sandbag barriers put in place along the Red River, in the northern section of Moorhead, during the 2009 flood. Source: City of Moorhead Maps:

<http://www.ci.moorhead.mn.us/home/showdocument?id=286>

The primary goal of the buyouts was to create open space for the development of flood barriers in the form of levees and floodwalls (Figure 2). As a result, Moorhead targeted riverfront properties and initially prioritized homes with the smallest difference between first floor elevation and the elevation of the highest adjacent grade. Over time Moorhead shifted to a neighborhood-based approach and prioritized one area north of town and one area to the south.



Legend

Levees

- 2nd Crest Contingency Levees
- City and USACE Levees

Sandbags

- Sandbags

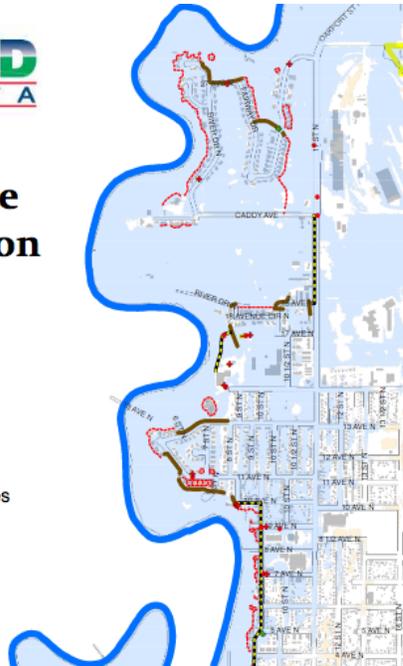


Figure 2: Levees and Sandbags on the Red River

The Buyout

The buyout began in 2010, and 264 homes were acquired in total. HMGP funds from FEMA were used to purchase two homes, while the Minnesota Department of Natural Resources Flood Hazard Mitigation Grant Funds and local matching funds were used to acquire the remaining 262 homes.

The state funds had local match requirement equal to 2% of median household income multiplied by the number households. Although the minimum match requirement at this time

was \$12 million, Moorhead ultimately provided approximately \$33 million. State funding was \$72 million, adding to a total of \$105 million.

By using state and local funds, Moorhead was able to greatly expedite the buyout process and avoid lengthy delays associated with getting FEMA approval of HMGP projects. It also gave them greater flexibility in how they could utilize and manage the properties after acquisition. Specifically, it freed them from HGMP rules prohibiting the construction of levees and floodwalls on buyout lands. In addition, few of the homes had a recent history of flooding—due to sandbagging—and many would not have qualified for HMGP funds.

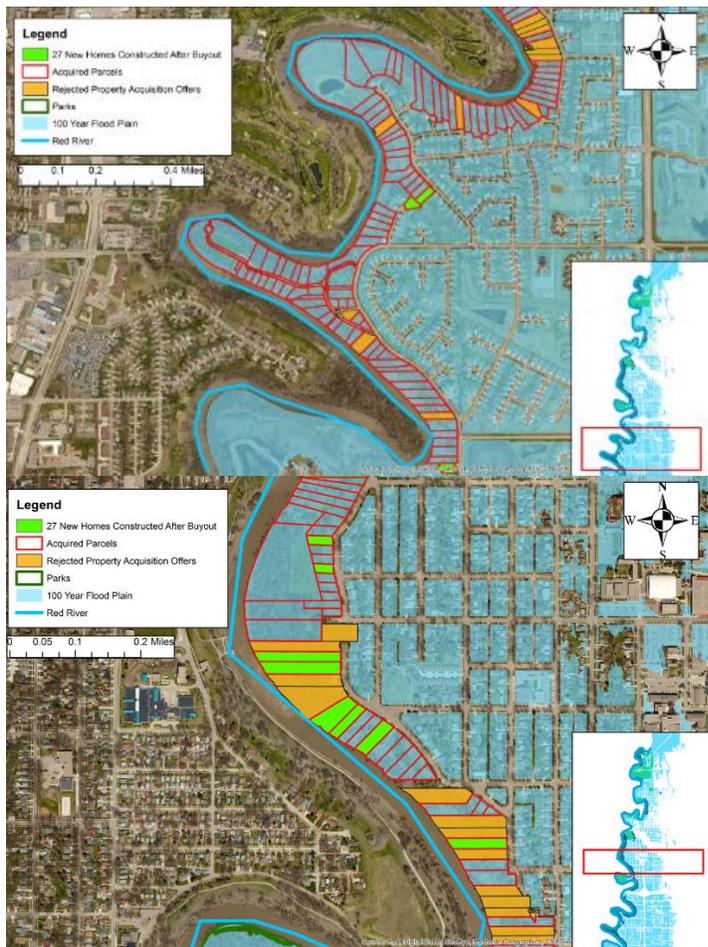
This was a voluntary program and the city found that, on average, appraised values were equal to 108 percent of the tax assessed value. To expedite the process, offers were made based on 108 percent of the assessed value. This process was used between 2010 and 2013.

Since 2013, Moorhead has used appraisals to determine purchase price. The city lacked programs to encourage participants to relocate to other locations in the city and it did not track

where participants moved. The City Engineers Office and the Planning Department oversaw the buyout program.

Figure 3 shows two areas where buyouts occurred along the Red River in Moorhead. Acquired parcels are outlined in red. Parcels highlighted in orange indicate where property owners rejected an offer to participate in the buyout, while those marked in green indicate where new homes were constructed, 27 in all, in the floodplain since the buyouts occurred.

Figure 3: Buyouts in Moorhead



Current Status

Moorhead has acquired approximately 226 acres of riverfront property since 1990. In terms of current land usages, the most restrictive are on the 20.7 acres acquired with FEMA funds. These areas can only be used for open space, recreational or wetland management purposes, dictated by FEMA restrictions. The remaining land can be used for public utility infrastructure and flood control structures.

Table 3: Total Number and Value of Homes Removed

Total homes in Moorhead	15,274
Homes acquired in buyout	264
Total cost of buyout	\$105,000,000
Average cost per home	\$397,727
Homes remaining in flood hazard area	N/A
Value of homes remaining in flood hazard area	N/A

In Moorhead, levees and floodwalls were built as far from the river as possible. Much of this land between the river and the flood control structures has been allowed to return to its natural state. Wild turkeys and deer were seen during the site visit. The City of Moorhead completed Master Plan for the Red River Corridor in 2014. The plan presents a long term vision and strategy to guide the management and use of the Red River Corridor in Moorhead (<https://www.cityofmoorhead.com/home/showdocument?id=956>). The vision includes flood management, recreation, connectivity and habitat enhancement. The goal of habitat enhancement is to “increase the area of native vegetation through preservation and restoration.” Habitats proposed for restoration include prairie, oak savanna and floodplain forest.

Integration with Hazard Mitigation Plan

The Minnesota State Hazard Mitigation plan lists flooding as one of the hazards that present the highest risk to the state and the greatest potential for mitigation. In addition, the City of Moorhead states that its floodplain management goals are to “minimize risk to life, health, safety, commerce, and governmental services and to avoid extreme public expenditures and impairment to the tax base.” Its buyout program, coupled with the construction of levees, protects property and minimizes the risk of future flooding along the river.

Integration with Land Use Plan

The Clay County Community-Based Comprehensive Plan, which serves Moorhead, does not reference the buyout program in its planning framework for land use and growth.

Conclusion

Moorhead's buyout program, financed with state and local funds, led to the expedited removal of 264 homes from the floodplain, with the objective of freeing space to build levees and floodwalls and reducing future flood risk. Moorhead's strategy to prioritize the removal of riverfront properties, later amended to focus on a neighborhood-based approach, helped avoid the piecemeal approach that limits many buyouts. A number of homeowners rejected the buyout, thus limiting recreational uses along the river (e.g., a continuous, uninterrupted walking trail along the river) and compromises efforts to restore and link wildlife habitat as well.

As a result of the buyouts, the city has acquired 226 acres of riverfront property that can now be used for open space, recreation, and wetland management (where regulated by FEMA) and for public utility infrastructure and flood control (where not regulated by FEMA). Moorhead's river corridor master plan, completed in 2014, further refines the city's strategy to manage and maintain the Red River Corridor in the event of future flooding.

References Cited

City of Moorhead and Fargo-Moorhead Metropolitan Council of Governments. 2014.

Moorhead River Corridor Master Plan.

Federal Emergency Management Agency. 2010. *Evaluating Losses Avoided Through Acquisition Projects: Moorhead, Minnesota.*