

# Flood Fighting

in Manitoba

A History and Background of  
Manitoba's Flood Protection Works

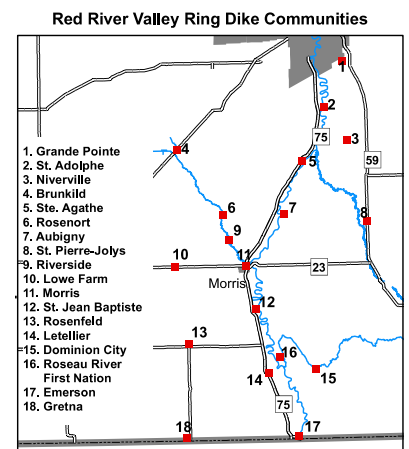
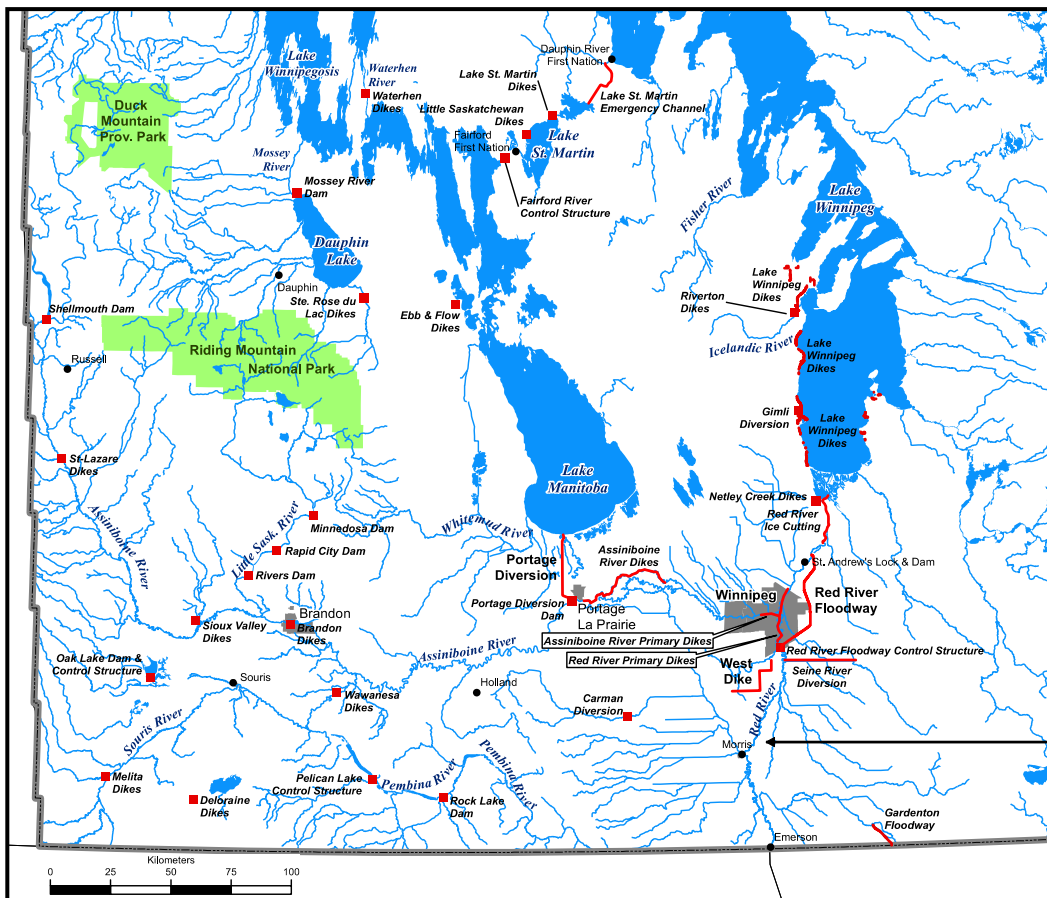
# Flood Fighting in Manitoba

Southern Manitoba has extensive flood control measures in place, particularly in the Red River Valley, from Winnipeg, south to the US border. Flood controls were built after the devastating flood of 1950, which flooded the Red River Valley and the City of Winnipeg. Construction of the Red River Floodway was completed in 1968. Additional flood control improvements, including an expansion of the floodway, were made after the Flood of the Century in 1997. This flood was substantially larger than the 1950 flood, but resulted in far less property damage because of the flood control measures in place. There are also flood control measures along the Assiniboine River.

Flood protection work has prevented property damage and reduced the potential impact of flooding on families and communities. Since the 1997 flood, more than \$1 billion has been invested in flood mitigation efforts in Manitoba. This investment has prevented over \$7 billion in damages throughout Manitoba.

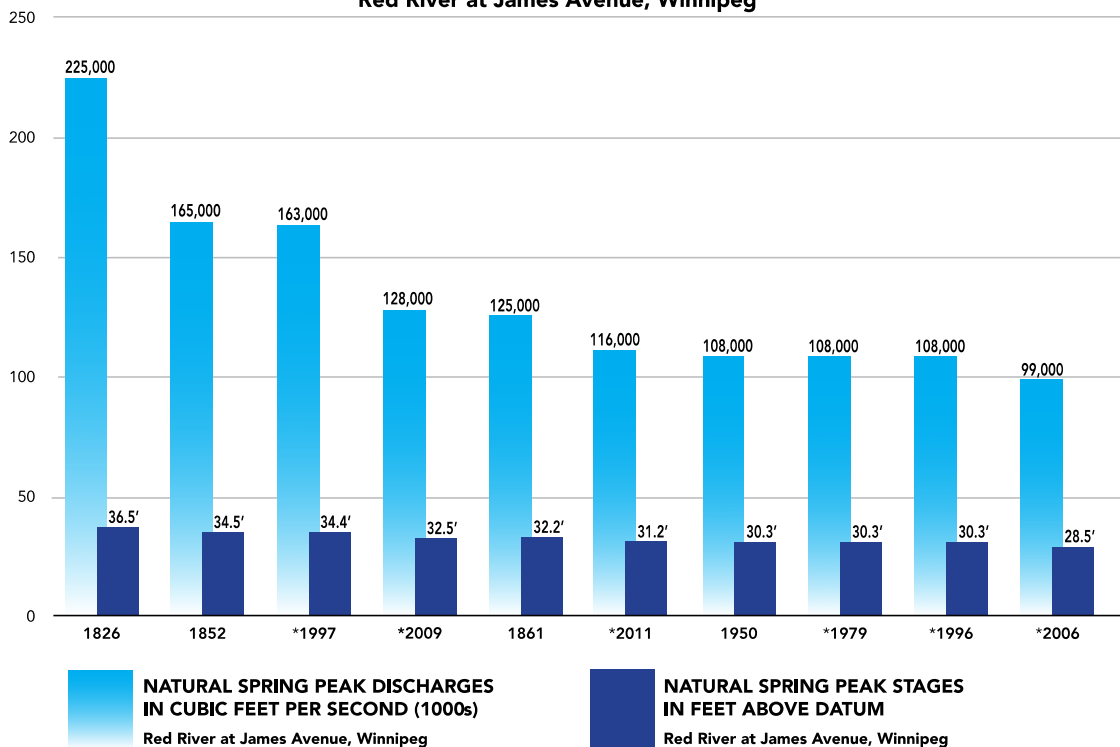
The 2011 flood affected a large geographic area and thousands of Manitobans. Early flood forecasts and flood-mitigation efforts helped many communities get a head start on protecting homes and lands, but damage was still widespread.

## Flood Control Infrastructure in Southern Manitoba



## Top 10 Red River Floods since 1800

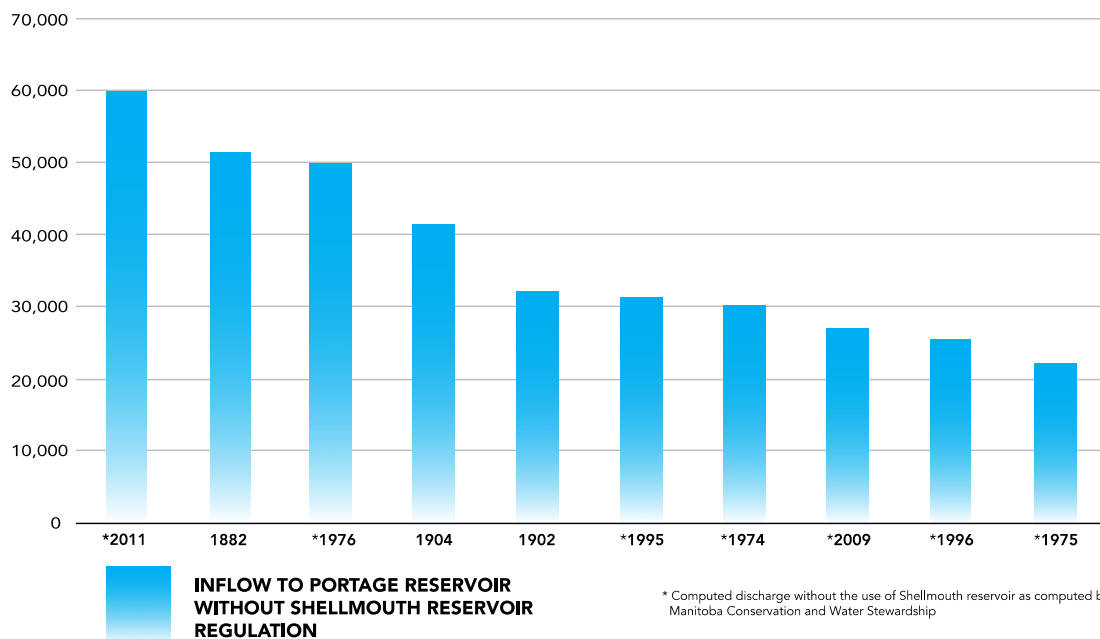
### Red River at James Avenue, Winnipeg



\* Computed Natural Discharge Without Use Of Red River Floodway, Portage Diversion, Shellmouth Dam  
Compiled by Manitoba Conservation and Water Stewardship

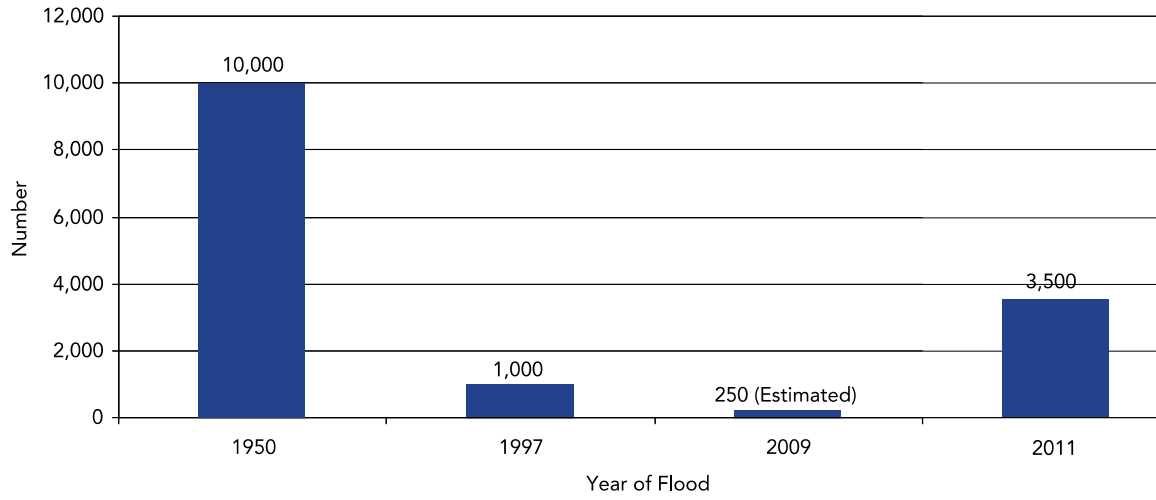
## Top 10 Assiniboine River Floods Since 1880s

### Assiniboine River at Portage la Prairie

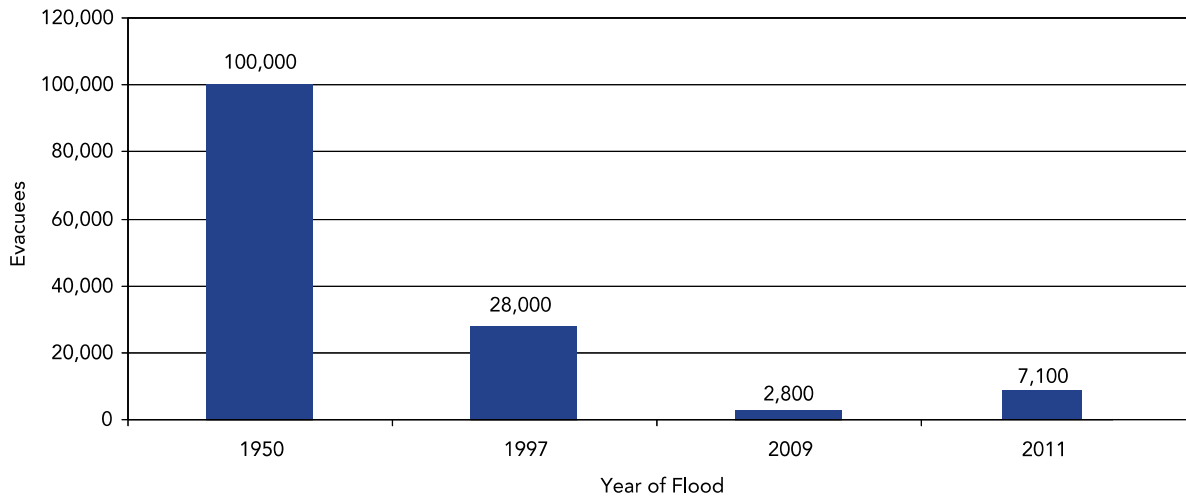


\* Computed discharge without the use of Shellmouth reservoir as computed by Manitoba Conservation and Water Stewardship

### Number of Homes Damaged During Spring Floods



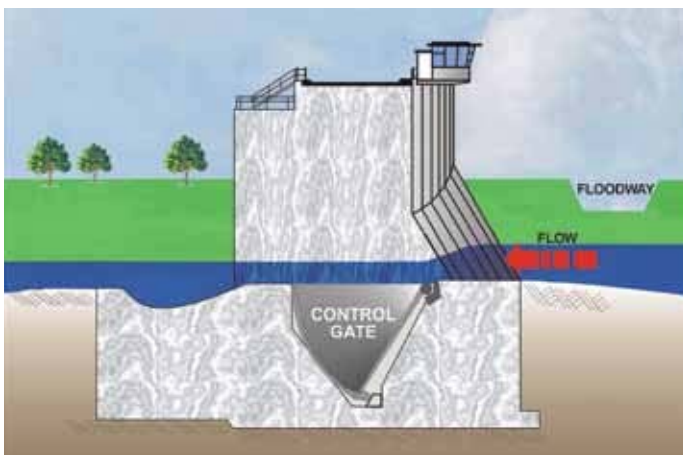
### Number of People Evacuated During Spring Floods



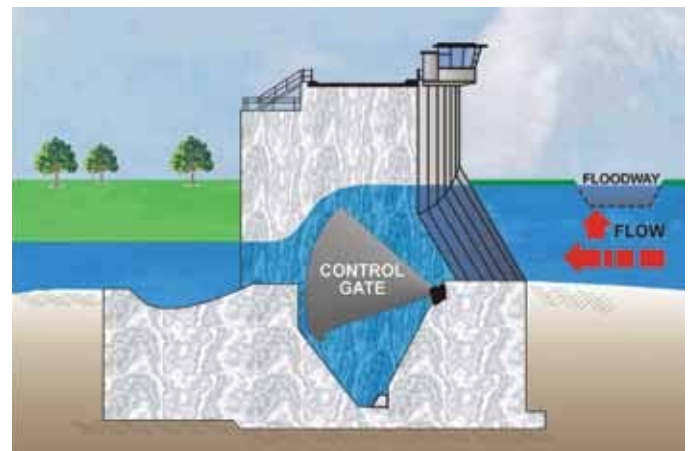
## Red River Floodway

One of the most significant flood protection measures in Manitoba is the Red River Floodway, which protects the City of Winnipeg. Starting in 2005, Canada and Manitoba invested \$665 million to further expand the Red River Floodway.

- The original floodway was built between 1962 and 1968 and cost \$63 million.
  - At the time, excavation of the floodway channel was the second largest earth moving project in the world (second only to the Panama Canal and larger than the Suez Canal project).
  - Since 1968, it has prevented more than \$40 billion (in 2011 dollars) in flood damage in Winnipeg.
  - It is often referred to as Duff's Ditch in recognition of then-Premier Duff Roblin, who spearheaded the development of the floodway.
- The expansion of the current floodway system (including the West Dike and channel outlet) began after the 1997 flood, to protect the City of Winnipeg from a one-in-700-year flood. It increased the floodway's capacity – from 90,000 cfs (cubic feet per second) to 140,000 cfs. The floodway operates by diverting a portion of the Red River flow around Winnipeg through the floodway channel. During flooding, as the river naturally rises, it spills over the floodway channel entrance and flows down the floodway channel. When this happens, the river water flows through two routes – through the city and through the floodway. At the same time, it drops below its natural level, south of the floodway inlet.



Floodway gates during normal summer conditions



Floodway gates raised to regulate water levels

- When the floodway gates are raised, the water level south of the floodway inlet is restored to its natural level which, in turn, allows more water to spill into the floodway. As Red River flows continue to increase, the level south of the inlet drops below natural again and the gates are raised further. This process continues as long as the flow in the Red River continues to increase.
- During the majority of floods, the floodway is operated to ensure that the water level south of the city is maintained at the natural level – that is the level that would occur if the flood control works did not exist.
- In a major flood, even larger than 1997, the flow through the city will be controlled with the guidance of three spring floodway operating rules. These rules are designed to ensure Winnipeg’s primary diking system is not overwhelmed. When these rules are implemented to protect the city, there may be instances when additional water going through the floodway causes artificial flooding of land and roads south of the floodway inlet. In recognition of this possibility, the Manitoba government has legislation in place which provides compensation to individuals impacted by this artificial flooding.
- A fourth floodway operating rule is also in place, but is only applied during the summer when high water levels affect Winnipeg’s storm sewer and combined sewer systems. The combination of high water and a high intensity rain storm can overwhelm the sewer systems causing basement flooding. If this occurs, operation of the floodway can lower water levels in the city, reducing the damages and potential health risk caused by basement flooding.
- The floodway is recognized as a National Historic Civil Engineering Site and is considered one of the world’s 16 engineering marvels. For more information, see [www.floodwayauthority.mb.ca](http://www.floodwayauthority.mb.ca).



*Floodway inlet control structure south of Winnipeg*



*Floodway outlet structure north of Winnipeg*

## City of Winnipeg Flood Protection

- The main protection for the city is the Red River Floodway, the Portage Diversion and the Shellmouth Reservoir.
- Within the city there is a primary dike system that protects land along the Red and Assiniboine rivers. There are also secondary dikes to protect low-lying areas on the river side of the primary dikes, including Kingston Row, Lord Avenue, North Drive and Kilkenny Drive North. For more information about Winnipeg's flood protection see: [www.winnipeg.ca/emergweb/](http://www.winnipeg.ca/emergweb/).
- After the 1997 flood, \$10.8 million was invested to protect homes and condominium complexes. As well, the secondary dikes in the city were further strengthened.
- The \$130 million under the 1997 Canada-Manitoba Partnership Agreement on Red River Valley Flood Protection funded these improvements.

## West Dike

- The 45 km (28 miles) West Dike is located south of Winnipeg and also provides flood protection for the city. It prevents Red River floodwaters from flowing into the La Salle River and entering Winnipeg. The dike is high enough to handle wind and waves during major floods. It was substantially and quickly reinforced in 1997.
- As part of the Red River Floodway expansion, the dike was extended approximately 11 km (7 miles) and raised in various areas up to 1.5 m (5 ft).

## Red River Valley Ring Dike Communities and Properties

- There are 18 ring dike communities in the Red River Valley providing protection up to 1997 levels, plus 0.6 m (2 ft). The dikes protect the communities and can be partially or fully closed during a flood. During the 2009 flood, the ring dikes prevented about \$700 million in flood damages to these communities.



Ring dike community of St. Jean Baptiste



Ring dike community of Morris

## Spring Flood Peaks

(feet above sea level; Winnipeg is based on James Ave.)

RED RIVER				
	Emerson	Morris	Winnipeg	Selkirk
1979	791.3	781.3	19.2	---
1997	792.5	783.3	24.5	729.5
2009	790.8	781.9	22.5	728.8
2011	790.3	779.3	19.6	724.0

- The communities in the Red River Valley with ring dikes are: Emerson, Gretna, Letellier, Rosenfeld, Dominion City, St. Jean Baptiste, Riverside, Rosenort, St. Pierre-Jolys, Aubigny, Morris, Roseau River, Lowe Farm, Ste. Agathe, Brunkild, St. Adolphe, Niverville and Grande Pointe.
- Over 1,800 sites in the valley have been flood-protected – homes, businesses, farms – preventing another \$100 million in damages during the 2009 flood.
- Ring dikes and other forms of flood works protect 95 per cent of the homes, businesses and farms in the valley.
- The 1997 Canada-Manitoba Partnership Agreement on Red River Valley Flood Protection funded \$130 million in enhancements to eight ring dike communities that already had ring dikes; provided for the construction of 10 additional ring dikes; and supported flood protection for homes, farms and businesses.

## St. Andrews Lock and Dam

- Built in 1910, the federally operated structure helps regulate low-flow water levels on the Red River. Its primary function is to raise the water level over Lister Rapids to allow river navigation.

## North of Winnipeg to Lake Winnipeg

- Approximately \$4 million has been invested in the ice mitigation program for this area. It includes seven ice cutters, three Amphibex icebreakers and support units for the equipment. One Amphibex is owned by the North Red Community Water Maintenance and two are owned by the Manitoba government.
- Following the severe ice jams in 2009, the 63 most flood-prone homes and cottages in the Breezy Point and St. Peters Road areas were purchased by the government so the homeowners could relocate.



One of seven ice-cutting machines



Amphibex icebreaker



The province works closely with Manitoba municipalities to plan and prepare for potential spring flooding.

## Flood Fighting Equipment

Manitoba has invested in a variety of flood fighting equipment, ranging from heavy equipment to specialized dikes and water barriers and has an inventory of temporary flood response equipment such as tiger dams and aqua dams:

- four Amphibex icebreakers, including one owned by the North Red Community Water Maintenance Organization
- seven ice-cutting machines
- six Argo amphibious ATVS and six trailers
- two million regular sandbags
- six provincial sandbagging machines
- 17,000 super sandbags
- 43 km (26 miles) of Hesco cage barriers
- 61 heavy-duty steamers
- 34 mobile pumps
- 50 km of water-filled barriers of which 22 km are in rapid-response trailers

# Manitoba's Emergency Management System

Manitoba has a strong emergency response plan that includes all municipalities and has been well-tested and implemented in previous flood emergencies.

- Manitoba Emergency Measures Organization (EMO) is the provincial government agency responsible to ensure the province has emergency plans, programs and systems that can be applied to identified risks and hazards. These plans and programs are contained within the Manitoba Emergency Plan (MEP). The plan is assessed and updated on an ongoing basis.
- Under *The Emergency Measures Act*, municipalities must have an emergency plan that is approved by EMO. All municipalities now have approved emergency plans and EMO works with all municipalities to ensure they are maintained.
- Manitoba's legislation provides for Emergency Prevention Orders which allow for a more limited set of powers than a State of Emergency Order. They can be used when there is a real possibility that the impact of an emergency or disaster could be reduced or averted.
- Municipalities are well-prepared to manage emergencies using:
  - o dedicated emergency co-ordinators who work closely with EMO's regional emergency managers
  - o current, effective, provincially approved emergency plans
  - o local and regional training programs
  - o local and regional emergency exercises that test plans for continuous improvement
  - o local emergency operation centres to co-ordinate with the provincial emergency co-ordination centre
- Manitoba's emergency response also includes:
  - o the provincial website, updated regularly with current flood forecasts, road and travel updates, evacuation details, important information about flood preparation – property protection, evacuation, pet and livestock protection, property recovery, financial help and stress management
  - o regular road updates on the province wide, toll free phone line
  - o ongoing updates on Twitter, Facebook, and Mobile
- Stay informed:
  - o Go to [www.manitoba.ca/flooding](http://www.manitoba.ca/flooding) for current forecasts, road closures and general information
  - o Go to [www.mb511.ca](http://www.mb511.ca) for updated road closures and travel info
  - o Call 1-866-626-4862 for general information
  - o Call 511 for current road/travel updates
  - o Follow us on Twitter - @mbgov and @mbgovroads
  - o Follow us on Facebook – [www.facebook.com/ManitobaGovernment](http://www.facebook.com/ManitobaGovernment)