

# **Flood-Water Storage, Flood-Water Right-of-Way, and Flood Insurance: Contracting Around a Flood**

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Almost every spring, Canada's southeastern grain belt and adjacent regions in the United States experience flooding. In most years, the Red River in Manitoba floods regions around Winnipeg and parts of North Dakota. The reason is that, in days gone by, much of the region was a lake bed; therefore it is flat and susceptible to flooding. However, the floods bring with them soil and nutrients that make this area one of the globe's breadbaskets. A similar story holds for areas in southern Saskatchewan along the Qu'Appelle and Souris rivers. Indeed, there are a significant number of places throughout both provinces that are in flood stage or under flood alert during the spring (see <http://www.saskflood.ca> and <http://www.gov.mb.ca/waterstewardship/floodinfo/index.html>).

On May 12, 2011, the most watched place in western Canada was near Hoop and Holler Bend on the Assiniboine River. Here the Manitoba government was waiting to decide whether to breach a dike along the river. This would flood a large area south of the river that included some 150 homes in order to protect some 800 homes further to the north. A map of the area to be flooded and that to be saved can be found at <http://www.brandonsun.com/breaking-news/Waiting-for-the-cut--121711009.html>.

At the same time, a similar situation was evolving along the Mississippi River. And the source of the flood waters was similar – large amounts of winter snowfall and late snow melt accompanied by spring rainfall. This situation was attributed to a strong La Nina event. Although flood waters along the river rivaled or exceed those of the Great Mississippi Flood of 1927, and exceeded those of the 1993 flood, one reason was the action taken after 1927 to keep the river in its channel. In any event, the 2011 flood is a natural disaster on a large scale ([http://en.wikipedia.org/wiki/Great\\_Mississippi\\_Flood\\_of\\_1927](http://en.wikipedia.org/wiki/Great_Mississippi_Flood_of_1927)).

On May 2, 2011, the U.S. Army Corps of Engineers, a civilian body, blasted a two-mile wide hole in a levee (dike) along the Mississippi River to avoid flooding the town of Cairo, Illinois, instead flooding a large area of farmland and the houses on it. A second levee was breached downstream and further actions are considered as the flood waters moved toward the Gulf of Mexico and New Orleans, which had been devastated by hurricane Katrina in 2005.

Those in Canada and the United States whose properties were sacrificed for the sake of others often objected strongly. They felt their rights were not protected, that the government was high handed, and there was confusion about whether they would receive adequate compensation and what form such compensation might take.

There are ways around this problem. Floods happen and steps can be taken in anticipation over and above the construction of dikes and flood walls, which might be too expensive to build and maintain. Scientists can identify less-populated, lower-lying areas that could store water for short periods of time, perhaps as long as six months – temporary lakes that could then be drained naturally or using pumps.

These could easily be opened to flood waters in the event of a major catastrophic event. To get landowners to accept this, the authority could enter into contracts that provide landowners with an annual payment plus a payout at the time of a flood event. Payouts could vary by the severity of the flood, which, in turn, can be determined from gauges that measure the depth of water.

Annual payments to landowners plus any contracted payment at the time of a flood can be met from a special tax on properties most susceptible to flooding. That is, property owners most likely to benefit from a contract that has one party accept damages in the event of a flood should also be the ones to pay the freight.

Negotiations with landowners will not be easy, partly because it may be necessary for several to agree to terms before flood-water storage can be effective. However, it will be in the best interests of landowners to come to some sort of agreement with the authority because the alternative is that they risk being flooded in any event. In the case of Manitoba's plan at Hoop and Holler Bend, it would be necessary for some 150 landowners to agree (although in their case, it is only to allow flood waters to pass across their lands, not store the water for a longer period). Clearly, landowners in this case would have been better off to have negotiated a contract rather than being surprised and unprepared for such an event, and, perhaps worse, having to come to terms with the government ex post. In the United States, the alternative is often for those affected to seek injunctions against actions to breach a levee in the courts – an expensive proposition.

Those in the potential path of a flood should also be given access to insurance derivatives that can protect them against floods. Most flood insurance schemes payout according to the damages caused by the water. In many cases, those living on a flood plain cannot even access such insurance, or pay exorbitant rates. Such insurance suffers from moral hazard. Moral hazard implies that those with insurance may not take sufficient action to reduce their exposure to damage – I'm insured so it doesn't matter what I do to protect my property. Further, the only property owners to buy insurance are those most vulnerable to floods and least able or willing to build levees around their homes – this is known as adverse selection.

Both adverse selection and moral hazard can be eliminated by tying payouts to weather events rather than flood damage. Thus, even persons well outside any flood zone can purchase weather insurance, in essence receiving an insurance payout if the weather event occurs. Someone damaged by flood receives a payout according to the size of the insurance contract that was purchased, which might be greater or less than the actual damage. Weather insurance provides a payout whenever the event specified in the contract occurs. With regards to flooding, a payout might be made when a river reaches flood stage, with the size of the payout either fixed or rising with the water level recorded at a particular gauge.

Sellers of weather insurance will charge based on past weather patterns. Data will be needed to determine the price that will make the insurance scheme actuarially sound. For those with ongoing, long-term contracts, the price will be lower than for those who, recognizing that a La Nina event is underway, for example, should be prepared to pay a significantly higher price.

While flood-water storage, flood-water right-of-way and flood insurance contracts should be part of any flood-control strategy, they are not the only bullet in the authority's policy arsenal. However, they are an important but neglected one. There needs to be much greater reliance on them in the future.