

Record snowfalls causing high waters in Great Plains

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Summers on the Great Plains are usually characterized by a lack of water. But flooding in several states has reversed that trend -- and it might not be the last of the high waters for 2011, according to a Kansas State University geography expert.

Richard Marston, university distinguished professor and head of the department of geography, said that some mountainous states still have 200 percent of normal snowfall for this season. Spring rains have also kept the ground moist, causing subsequent runoff. This has contributed to flooding in North Dakota and along the Missouri River. More flooding also is likely along the front range of the [Rocky Mountains](#), Marston said.

"As temperatures warm up, especially when you get warm rain on top of snow, you get a lot of runoff and melting," Marston said. "This also causes flooding in non-mountainous areas."

The Souris River, which has engulfed Minot, N.D., is similar to many other rivers in the [Great Plains](#), Marston said. The river has a low slope that slows the speed of water. This allows for an influx of water to continually accumulate.

Flood controls and related decisions have also exacerbated the extent of damage, particularly in North Dakota. [Levees](#) are traditionally accepted as an effective method of flood control and have been implemented on a wide scale. Attempting to control rivers through building levees has eliminated adjacent wetlands, the traditional spot for [water storage](#) during floods. It's a common issue that has had negative effects on [flood control](#), according to Marston.

"Back in the early 1900s, the total damages for flooding in the entire country were \$100,000 per year," he said. "Now it's in the billions per-year average."

Another contributing factor has been development in floodplains. Covering a natural [soil surface](#) with concrete and asphalt, combined with the same [weather events](#), creates more runoff, Marston said. Many areas, including some in Manhattan, need to redo floodplain mapping to add at-risk areas.

The flooding has forced a series of tough decisions for the U.S. Army Corps of Engineers, the federal agency responsible for public works projects. In May floodwaters on the Mississippi River threatened the city of New Orleans. To relieve the burden on the levees around the low elevation city, the corps chose to blast a levy in rural Missouri that destroyed a small town and agricultural land. The Corps of Engineers used their system as it was designed, Marston said.

"It's a complex situation like with most human impacts on rivers," Marston said. "When we start mucking around with the connection between the river and its floodplain, things might look rosy for a period of time, but eventually you will have to pay the piper."

The flooding in North Dakota and along the Missouri River has been described by a variety of sources in the context of 100 to 500-year floods. A 100-year flood is commonly perceived as being an area that is flooded once every 100 years, Marston said. Instead, a 100-year flood means there is a 1 percent chance an area could be flooded yearly. This can cause big decisions in terms of development or future residency for areas in flood plains.

"It depends on what kind of gambler you are," Marston said. "Many times the losses from these floods are complete and devastating."

Fixing the myriad flood-related issues will involve a total effort, according to Marston. Shifting a focus from developing in floodplains and changing methods of flood controls are primary focuses, he

said. Land-use planning provides an alternative to levees and dams.

"I tend to favor nonstructural approaches to flood management," Marston said. "The history of dams and levees is clear in our country. They have prevented damage from floods, but what happens when the big one occurs? The damage can be worse than it would have been without the levees."

Provided by Kansas State University

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