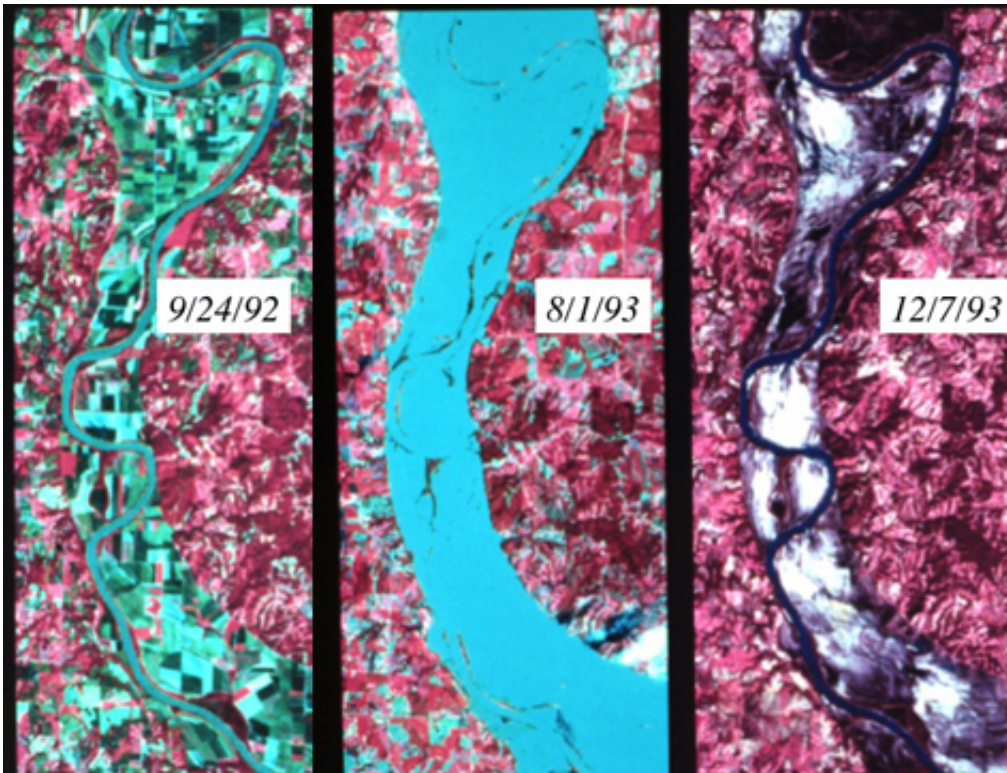


# Flooding will only worsen unless river management improves, hydrogeologist says

May 11 2011



Damage to farmland from levee breaks or detonations can be permanent. Satellite images of the Missouri River in central Missouri show a patchwork of floodplain farms before the 1993 flood (left), bluff-to-bluff inundation during the flood peak and after multiple levee failures (middle) and the resulting severe scour. Sand (light areas) covered the fields after the flood receded (right). Farmland was so severely degraded that thousands of acres were subsequently transferred to the Big Muddy National Fish and Wildlife Refuge

(PhysOrg.com) -- Asked by a news reporter whether, when he watched this year's flooding, he got the feeling of déjà vu all over again, Robert Criss, PhD, responded "Well, it's déjà vu over again almost every year."

"Every year we're experiencing higher and higher water," says Criss a professor of geology in the Department of Earth and Planetary Sciences in Arts & Sciences at Washington University in St. Louis who specializes in hydrogeology, the geology of water and systems of water.

"This year we have record flood levels at many gauging stations just south of St. Louis. In 2008 we had record flood levels in many parts of the northern Mississippi River. There will come a point where people in the federal government will need to realize that flooding is actually getting worse and the things we have been doing are not solving this problem; they are aggravating it."

It's not your imagination, Criss says. The river is becoming more chaotic and unpredictable. Floods are more frequent and more severe.

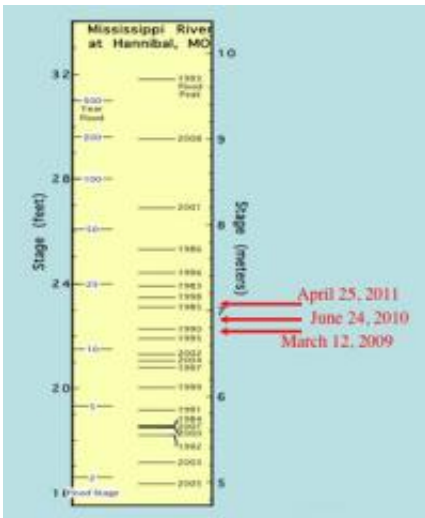
Criss is particularly distressed by the Army Corps of Engineers' estimates of flood frequency, which he says are far off the data.

It's common to refer to a "100-year flood" or a "500-year flood," implying that we will not see such devastation again in our lifetimes.

"The problem is we've had many '100-year floods' and '500-year floods' at single sites in the last 20 years," Criss says. The failure to get the frequency of flooding right, he feels, gets in the way of solving the problem.

Flooding is also more severe because we're overbuilding the levees and building in the floodplains. The levees constrict the river and locating new development in the floodplains restricts the river even more while

ensuring that [flood](#) damage will increase.



Something is off with the Army Corps of Engineers' figures. On the left are Army Corps of Engineers estimates of the intervals at which the river at Hannibal Mo. will reach a particular stage. The data for actual flood levels is on the right side. Hannibal has suffered a "200-year flood" and a "500-year flood" in the past 18 years, and in the three years since this chart was published, experienced three more "10-year" floods (shown in red).

“The [rivers](#) are far more narrow than they used to be. The Mississippi River at St. Louis, and the middle Mississippi generally, is less than half as wide as it was historically,” Criss says. It’s been walled off and constricted by both wing dikes and levees. So the water backs up at times of high water and flooding.”

The second part of the problem is that we’re building in the floodplains, Criss says. “That means the floodplains can’t play their geomorphic role as water storage areas and it also means more homes and businesses are in harms way.”

To work our way out of this mess we need to do the opposite of what we're currently doing, Criss says. "We've got to move people and businesses out of the floodplains. And we should put gates on some of these levees so that we can slowly open them and let water gently into the floodplain areas."

"Blowing up the levees is a 1927 plan," says Criss, "and it has no place in today's world. When a levee is blown, the water scours the land removing the topsoil and often rendering it unsuitable for farming. Gates would protect the levees and allow water to cover farmland without damaging it.

"So," Criss says, there are far better ways to deal with the problem than just trying to build levees higher and having municipalities compete with one another and with the farmers about who's got the highest levee and who's got the right to be protected in times of distress."

Provided by Washington University in St. Louis

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