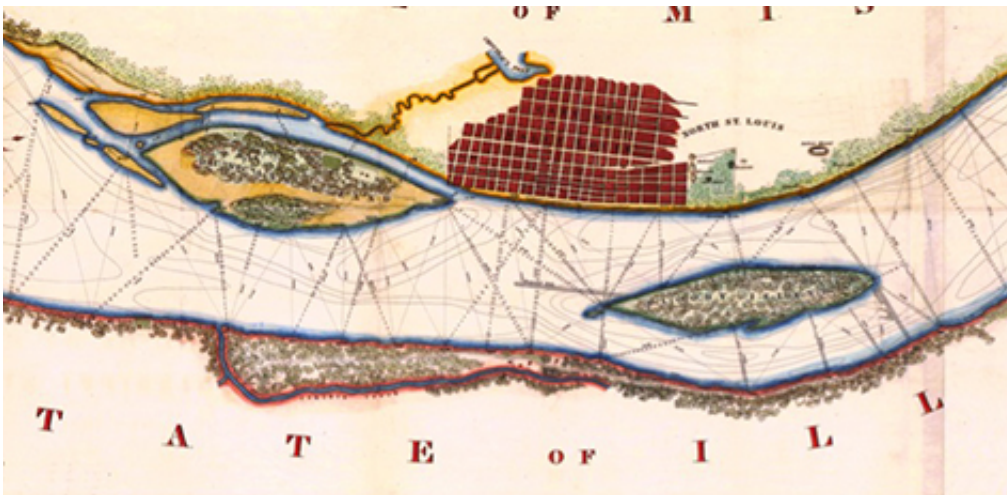


Hydrogeologist questions reservoir releases and blasting rock to deepen the Mississippi for barge traffic

January 28 2013



The Mississippi at St. Louis as mapped by then-lieutenant R.E. Lee of the Corps of Engineers in 1837.

(Phys.org)—The Jan. 17 issue of *The New York Times* celebrated "the remarkable feat of engineering" that kept the Mississippi River open to barge traffic despite extreme drought in the Midwest. The U.S. Army Corps of Engineers, the article said, had dredged, blasted and scraped away rock obstructions along the riverbed, lowering the bottom of the channel at Thebes, Ill., by two feet.

What's more, engineers and [water managers](#) had awoken every two hours

through the night to release precise amounts of water from upstream reservoirs so as not to waste a single drop. It had been, in short, a heroic effort to rise to the challenge of falling water levels.

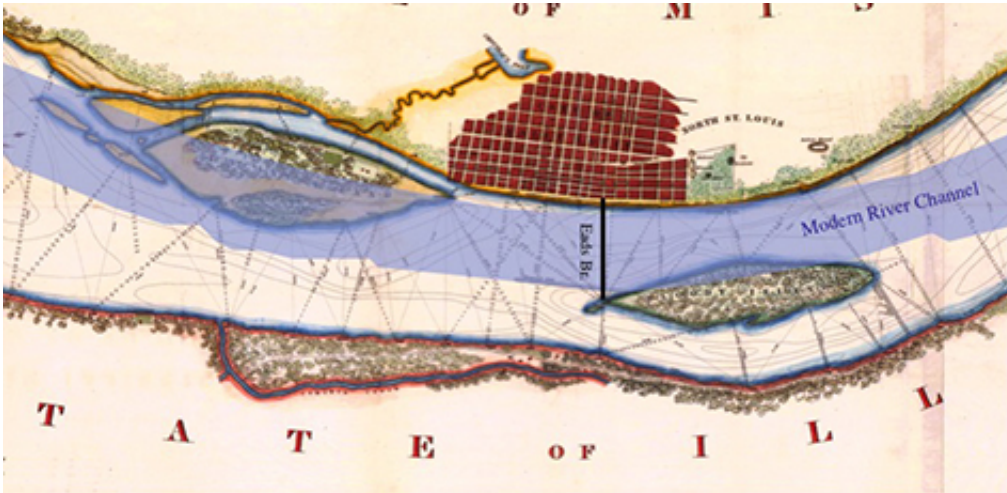
A hydrogeologist at Washington University in St. Louis, who has watched and brooded over the nearby river for 18 years sees it quite differently. "It was a trumped up crisis," says Robert W. Criss, PhD, a professor of earth and planetary sciences at WUSTL, "and I am offended by the way the news media has puffed it."

"We've got to start to recognize the realities of how rivers work," Criss says.

The [shipping industry](#) wants to maintain a nine-foot depth so that barges carrying fossil fuels, grain and gravel can move down the river all year round.

But, says Criss, rivers are low in this part of the world at this time of year. In the normal annual cycle, the water recedes in the dry months of the fall, tapers off in the winter and then in the spring, the river floods.

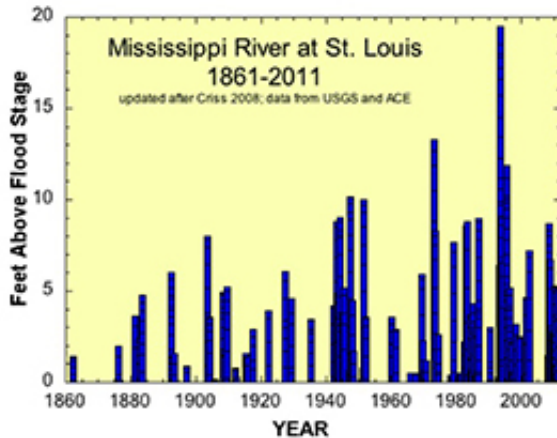
He also points out that the Missouri River, which empties into the Mississippi north of St. Louis and accounts for 45 percent of the annual flow of the river as it passes St. Louis, has a huge catchment (it rises in western Montana) but one that receives very little rainfall. Most of the watershed gets less than 20 inches of precipitation a year, about as much as Iraq.



The modern Mississippi river channel (blue) overlaid on R.E. Lee's map. Bloody Island no longer exists and the Eads bridge connects Missouri to Illinois. River engineering has turned the Missouri and Mississippi, once braided rivers, into narrow, monotonous channels that are actually more, not less, likely to flood, says WUSTL hydrogeologist Robert Criss.

"We've got to stop subsidizing anachronistic industries like the barge industry," he says. "The barge companies would be out of business in a hot minute," Criss says, "if they had to maintain their own river channel and pay to use locks."

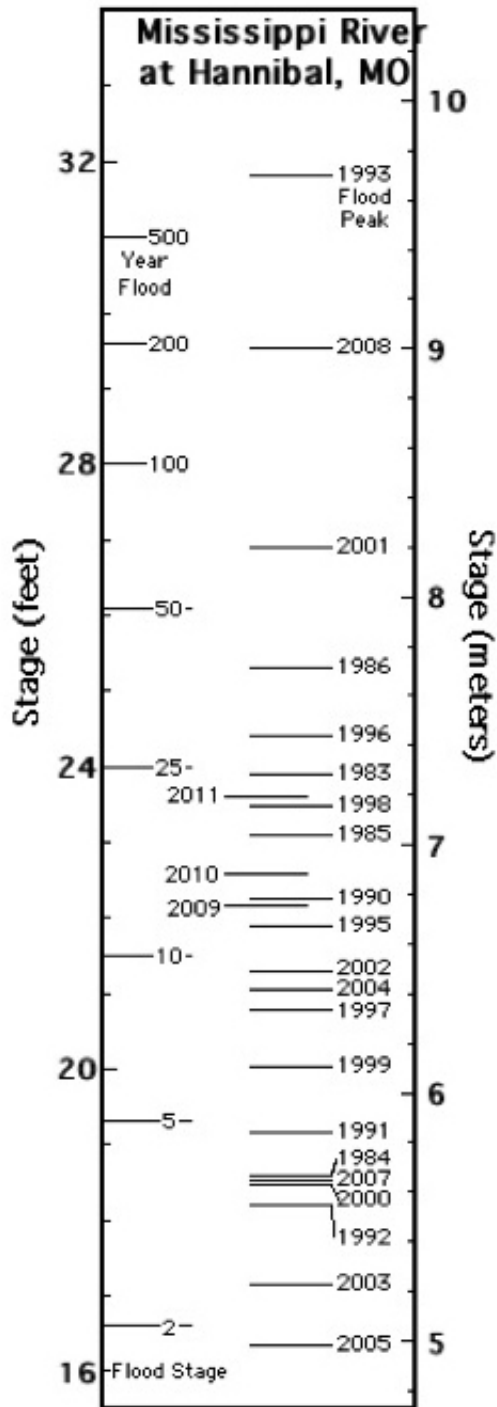
Several recent news stories have quoted shippers saying they cannot afford the cost of shipping by rail rather than by barge. "They're right," says Criss, "but only because the economics have been skewed by public policy: Railroads pay to maintain their own track."



“River engineering hasn’t controlled the river,” Criss says. “It’s created a monster; the river is more and more unpredictable each year.”

"We can pretend barges can move tonnage cheaper, but the system they use is subsidized by the taxpayer and costs us dearly," Criss says.

"I believe that good environmentalism is good economics," Criss says, "and we'll make good choices only if we factor into the accounting the cost of the use or degradation of a natural resource we hold in common, such as the air or water."



Criss has been calling for years for the U.S. Army Corps of Engineers to redo its flood frequency calculations. The frequencies the Corps uses are on the left axis of this chart and the floods that actually occurred over the past 30 years are on the right. (The chart is taken from a 2008 article in Environmental Health

Perspectives, to which the consecutive “10-year” floods of 2009, 2010 and 2011 were added.) Because the calculated frequencies are so unrealistic, Criss says, federal flood insurance is grossly underpriced and floodplain development projects are not appropriately discouraged.

The barge industry was rescued this time by blasting but also by the release of 150,000 acre-feet of water from Lake Carlyle, a reservoir on the Kaskaskia River in Illinois. This "free" water, Criss says, would be worth many millions of dollars in the drought-stricken western United States.

"We're living in an imaginary world," says Criss, "and not dealing with our problems realistically. We should be investing in things where there is an opportunity for growth in the future, and there is no possibility of long-term growth in sending bulk-tonnage materials halfway around the world."

Criss doubts not only the accounting, but even the facts in stories about the river. On Jan. 8 the *St. Louis Post-Dispatch* said the river levels were the lowest they'd been in seven decades.

"Not so, said Criss, in a follow-up letter to the editor. The river was as low or lower in 1989 and in 2003. He points out that detailed stage records are provided online by the U.S. Geological Survey and by the National Weather Service's "Rivers and Lakes" pages.

Criss, having battled the U.S. [Army Corps of Engineers](#) for years, no longer trusts their calculations (see floodplain diagram). He is not alone in this. In 2000, a senate subcommittee accused the corps of "skewing data to justify higher spending for water projects," according to *The New York Times*.

In 2005, again according to *The New York Times*, the National Academy of Sciences found that "the agency routinely inflated the economic payoffs of its construction projects to justify steadily greater budget outlays, while underestimating the environmental damage of those projects."

In 2006, Senators John McCain (R-Ariz.) and Russ Feingold (D-Wisc.) introduced amendments to a Water Resources Development that required proposed corps projects be submitted to peer review. The act became law in 2007, but by then Feingold had withdrawn his support because he felt the reform would not change the way the corps did business.

Criss points out that crises on the Mississippi will only become more frequent because climate change is expected to amplify stream flow variations. "Just last year, the river was too high for barges," he says, "yet this year the river is too low for barges."

Provided by Washington University in St. Louis

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