Water supply shifts as global climate changes

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Many of the world's great rivers are becoming less so. Yet in the Midwest, the wet is getting wetter. So says a study that finds global climate change shifting weather and water patterns around the planet.

"In terms of water, the rich are getting richer and the poor are getting poorer," said Kevin Trenberth, head of climate analysis at the National Center for Atmospheric Research.

And, he said, the poverty of precipitation is more dramatic than the wealth of water around the world.

He's a lead author of a study that looked at the flow of water in 925 rivers over 50 years.

The researchers found significant shifts in about a third of the large waterways, with most seeing less rainfall in their basins and consequently less water washed out to sea.

The drop-off in all the river water dumped into the Pacific Ocean between 1948 and 2004 nearly equals the amount that was flowing from the mouth of the Mississippi River.

But in the giant basin that feeds the Missouri, Ohio and Mississippi rivers, rainfall increased over the 50-year period _ even as the region saw greater swings from drought to flood and drought again.

While the researchers accounted for various human diversion of water for city and farm use _ the sort of uses that shrink the Colorado River from a whitewater gusher in the Grand Canyon to a mere trickle by the time it reaches the U.S.-Mexican border _ climate mattered more.

"Human activities on yearly stream flow are likely small," the researchers wrote, "compared with that of climate variations" created by the buildup of greenhouses gases in the atmosphere.

With the atmosphere warming and able to hold more evaporated water _ on average 4 percent more today over the world's oceans than in 1970 _ that means much of the world's more arid regions are becoming drier.

The study's authors say the trend could set up increased competition to tap into the world's lakes and rivers.

The study, published this month in the American Meteorological Society's Journal of Climate, noted rivers that serve large and fast-growing populations _ such as the Colorado River in the southwest United States _ are seeing declines.

The study said that is "in sharp contrast to the perceived but unjustified notion" that the amount of water a river ultimately spills into an ocean should rise with warmer temperatures. Instead, the global warming trend keeps more evaporated water vapor suspended in the atmosphere.

There was one dramatic exception. In the Arctic, the researchers found "an earlier onset of spring ... induces earlier snowmelt and associated peak stream flow in the western United States and New England and earlier breakup of river ice in Russian Arctic rivers and many Canadian rivers."

The amount of fresh water poured into the Pacific Ocean fell 6 percent during the period measured by the study.

In the Atlantic, Amazon River declines were offset by high flows in the Mississippi and South America's Parana River.

Meanwhile the Northwest's Columbia River captured about 14 percent less water because of both dropping precipitation and growing municipal and agricultural use.

The Missouri River is coming out of a nine-year

drought, with the mountain snowpack that feeds its headwaters measuring 27 percent above normal this year. The U.S. Army Corps of Engineers says records dating back a century show no significant shift in runoff in the basin.

"If it's increasing," said the corps' Paul Johnston, "it's not enough extra to be noticed."

Even if the region saw slightly more precipitation, disputes are not likely to dry up between upstream Missouri River states that want to keep their reservoirs filled for recreation and downstream states that need water to float barges and supply cities.

"There will still be plenty to fight about," said Richard Opper, the former executive director of the Missouri River Basin Association. "It's not just a question of total rainfall. What you really need is snowpack, and the long-term trend is that's diminishing. Snowpack can be doled out over the course of the summer by controlling the dams. Rain is quick and doesn't necessarily come where and when you need it."

Still, water is not nearly as scarce in the Midwest as in the West. Las Vegas is so thirsty that it is contemplating building desalination plants for Southern California in return for the right to draw more from the Colorado River.

Those sorts of developing water crises might make the Midwest more attractive to development.

"Some areas are beginning to see real limits," said Heather Cooley, a researcher at the Oakland, Calif.-based Pacific Institute. "I don't think you're going to see population shifts right away, but that might be a long-term consequence."

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