Population growth puts dent in natural resources

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It's a 500-pound gorilla that Robert Criss, Ph.D., professor of earth and planetary sciences in Arts & Sciences at Washington University in St. Louis, sees standing on the speaker's dais at political rallies, debates and campaigns. Its name is population growth.

"Population growth is driving all of our resource problems, including water and energy. The three are intertwined," Criss says. "The United States has over 305 million people of the 6.7 billion on the planet. We are dividing a finite resource pie among a growing number of people on Earth. We cannot expect to sustain exponential population growth matched by increased per capita use of water and energy. It's troubling. But politicians and religious leaders totally ignore the topic."

Criss specializes in hydrogeology, the geology of water and systems of water. Much of his work has an environmental slant. He investigates the transport of aqueous fluids in environments that vary from rivers and cool potable groundwater systems essential to civilization, to deeper and hotter hydrothermal systems. The results may be combined with physical, chemical, or geologic data to infer numerous aspects about the origin of waters and the processes that subsequently affect them.

A major focus for Criss and his associates is the origin, character and behavior of river and floodwaters in the Mississippi, Missouri, and Meramec River basins. Since 1990, the mid-continent experienced floods of such severity that they would not, under normal circumstances, be expected to have all occurred in a period less than several centuries.

Criss and a colleague have proven that engineering modifications of waterways have increased the frequency and severity of floods on most Midwestern rivers.

For decades, he has taught a popular non-major course for undergraduates, Human Use of the Earth.

The United States is experiencing rapid population growth – at a rate higher than almost any other developed country – along with increased food production, Criss says. In many areas, especially the West, this is being done by "mining" ground water to irrigate arid or semiarid land, which won't work in the long run. "Energy and water use are intimately related," he says. "As water tables decline, you have to use more energy to lift the water out of the ground. That's what a pump has to do in places like Arizona where water levels have dropped many hundreds of feet. More people, more water use, more food, more energy. It's not sustainable. "

Criss says approximately 150 million Americans use ground water, most of which is nonrenewable. When a well cannot pass drinking water standards, it's shut down and another one is drilled. Ground water production leads to dropping water levels in many places and subsidence or saltwater intrusion in others. The latter is the case in some of Florida's coastal cities, where salt water mixed in ground water has made drinking water unpalatable.

"Ground water, fossil fuel resources, cropland and forests are all being depleted or degraded," he says. "Thoughtful arguments can be made that for a sustainable world, we already have too many people, far more than can live by decent standards."

He says that, worldwide, the rates of increases of water and energy use have gone up faster than population growth for the past 50 years. The

fertility rate has actually lowered in much of the world, but the United States rate of 2.1 is now not much below the world's average, which is 2.6 children for every woman of child-bearing age between 15 and 49.

Despite what might appear as progress, Criss is disappointed that the United States has not contributed to the United Nations Population Fund for the past seven years. The Population Fund, begun in 1969, enables people in participating countries to learn about population and reproductive health.

"These U.N. projects have made great progress without any United States help," Criss says. "Many countries are seeing reduced growth rates. Africa still has a bad problem, but things are not as bleak as seven years ago. There are many medical, logistical and environmental reasons that these efforts should be supported. It's a considerable embarrassment to me that my country isn't chipping in."

Criss says there is a dearth of thoughtful dialogue on mankind's pressing problems in the political arena. The pols, he thinks, see the 500-pound gorilla but ignore it.

"Having children when you're too young, too old, or having too many children, are not good for the world," he says. "Some of the candidates seem to have worldviews incompatible with the realities of the world. It's obvious there are too few resources to go around now. The notion that we can just continue to grow and grow and grow is not realistic."

Criss says real change can come if the country can grasp the great risks involved with our present tack.

"There's an old saw that the definition of insanity is doing the same thing over and over and expecting a different result," he says. "Oddly enough, that is our current energy policy, and it's not a winner."

Source: Washington University in St. Louis