Bacteria in the Rio Grande Basin

What you need to know for recreation and health

FACTSHEET on *E. coli* bacteria in the water of the Rio Grande

The Rio Grande downstream of El Paso, Texas

What are *E. coli* bacteria and why are they important?

Photo: Dr. George DiGiovanni

Escherichia coli (E. coli) is a type of bacteria that is present naturally in the environment and in the digestive systems of humans and warm-blooded animals. Humans and animals excrete these bacteria in their waste. *E. coli* is what the U.S. Environmental Protection Agency (EPA) uses as their indicator for fecal contamination of water. Elevated levels of *E. coli* have been found in several places in the Rio Grande in both Texas and New Mexico.

Why is *E. coli* a concern?

Most strains of bacteria, including *E. coli*, are not harmful to humans, but they may indicate the presence of other possible disease-causing organisms that also live in human and animal digestive systems. These organisms (which include viruses and protozoans) can cause diseases such as typhoid fever, hepatitis A, dysentery and cholera. These disease-causing organisms are usually present in low numbers in water and are very expensive and difficult to test for. Most agencies consider the presence of *E. coli* in water samples as an indicator of disease-causing organisms in recreational, drinking and flood waters.

High bacteria is one of the biggest water quality issues of the Rio Grande...

How do *E. coli* bacteria get into the Rio Grande?

Contamination of water with human or animal waste, known as fecal contamination, can happen in many different ways. Sewer overflows, which occur during rainstorms when pipes carry both rainwater and sewage, may contribute to contamination in the river. Leaking septic tanks, sewer malfunctions, feedlots, animal waste (both domestic and wildlife), and landfill leakage are all common sources of water contamination. Rain events can wash all of this into the Rio Grande and other nearby waterways without the water being treated first.

What are the health risks from contact with bacteria?

Health risks associated with contact with the water in the Rio Grande are minimal because *E. coli* is usually not harmful. However, water with high levels of *E. coli* may contain other disease-causing organisms, and ingestion of contaminated water from any area should be avoided when swimming. Symptoms from ingesting contaminated water could include stomach and bowel discomfort, which can cause problems such as diarrhea, vomiting, and abdominal cramps. Symptoms, while uncomfortable, are rarely life-threatening and usually require very little, if any, medical treatment. Most gastrointenstinal illnesses are allowed to clear up without treatment in just a few days. Contact of *E. coli* with skin does not usually result in any symptoms (no rash, for example), unless there are open wounds. Other illnesses commonly seen when swimming in contaminated water include infections of the throat, eye, nose and ears. If you come into contact with contaminated water, make sure to wash the areas well with warm soap and water, particularly your hands, and any other item (balls, Frisbees) that came into contact with the water. In the event of ingestion, make sure to report any illness or symptoms to your doctor.

How is *E. coli* monitored in the Rio Grande? In our drinking water?

Routine water samples are collected by different agencies and sent to a laboratory for analysis. These agencies include the U.S. Section of the International Boundary and Water Commission (USIBWC), the Texas Commission on Environmental Quality (TCEQ), the U.S. Geological Survey (USGS), and others. The laboratory will test the water samples for many different chemicals and organisms, including bacteria, and send the results to the agencies so that they can determine if any action is necessary. Treatment plants that provide drinking water to large populations are required by law to test their water systems for the presence of bacteria. The plants must test a specific number of times monthly to ensure the safety of their water supply.

What is considered a "safe" level of bacteria?

Each individual is responsible for deciding what kind of risk they wish to take when swimming in lakes, rivers, and other water bodies. Each state has regulations on the amount of bacteria that is considered safe for waters where there is contact recreation, which includes swimming. In the states of Texas and New Mexico, *E. coli* levels in many parts of the Rio Grande are above the state regulated levels, and in these areas the Rio Grande is impaired for bacteria. This does not mean that bacteria readings above this indicate that an individual will get sick; it simply means that the **risk** for becoming ill is greater. The same is said about bacteria levels lower than these numbers--lower numbers do not mean that the water is completely safe either.

Sources: Indiana Department of Environmental Management, E. coli Fact Sheet, www.idem.IN.gov; U.S. Environmental Protection Agency, Fecal Bacteria, www.epa.gov/volunteer/stream/vms511.html; DiGiovanni, George. Drought May Concentrate Pathogens in Surface Water. *Southwest Hydrology*, Vol 3, Number 4, Nov/Dec 2004; Public Health Solutions www.phsneb.org/alpha_search/e.coli.water.html; and EPA's Pollution Toolbox http://www.epa.gov/nps/toolbox.

Can I swim in the water? What about canoeing or kayaking? Can my dog drink the water?

As required by the Clean Water Act, each state is responsible for compiling a list of water bodies with contamination levels higher than surface water quality standards. If a water body is impaired for contact recreation, the **risk** of becoming ill during recreational activities such as swimming, canoeing, or kayaking increases. Pets and people should be discouraged from drinking the water in the Rio Grande, and from any water body that is not properly treated. You should be aware before swimming in the water whether the water body is impaired. You should also avoid swimming after a big rain event, especially in urban areas, because bacteria levels may be higher due to runoff into the waterways. In the West Texas area, during non-irrigation cycles or drought periods, water levels are lower. Water bodies during these conditions may contain higher levels of disease-causing organisms than normal, and the chances of becoming ill increase. This is because the water does not flow regularly, allowing bacteria and other pathogens to accumulate more readily than if you had a large amount of flowing water.

Some of our drinking water comes from the river--What is done to protect me from *E. coli* and other bacteria?

The water that comes out of the faucets in your home is treated by local water treatment plants and **is safe to drink.** Treatment plants and other facilities use many different types of methods to sanitize drinking water. The most commonly used methods are chlorine and ultraviolet light, but other methods may also be utilized.

What is being done to improve water quality in the affected water bodies?

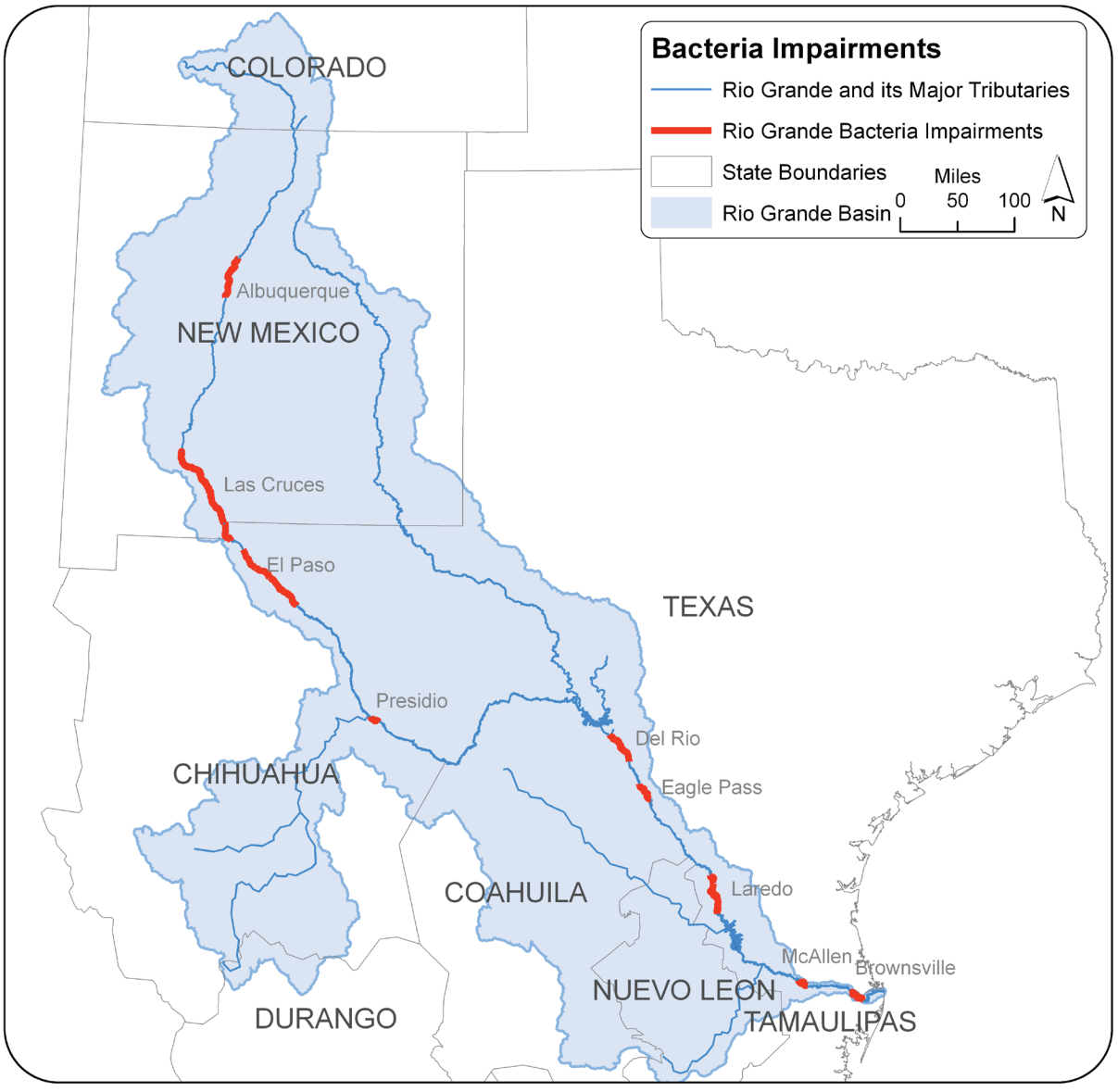
Various entities are working on projects to address bacteria in surface water. The Paso del Norte Watershed Council and the New Mexico Environment Department are working on a watershed plan for the southern New Mexico portion of the Rio Grande. The USIBWC Texas Clean Rivers Program conducts routine monitoring as well as intensive monitoring to understand bacteria contamination in the Texas portion of the Rio Grande. These entities are also conducting outreach to make the public aware of the issues. International entities such as the Border Environmental Cooperation Commission assist communities with money for infrastructure projects for sewer systems. See websites on back for more information.

Photo: City of N. Las Vegas, EPA NPS Toolkit

What can I do to help?

Here are some ways you can help protect the Rio Grande from bacteria:

- Pick up your dog's waste when you walk your dog;
- Ensure your septic tanks are pumped and inspected regularly;
- Ranchers can manage their herds so they don't graze along streams;
- Participate in community cleanups for highways and rivers;
- Visit www.inyourwater.org for more tips on what you can do;
- Get involved in your local watershed group (see websites on back).

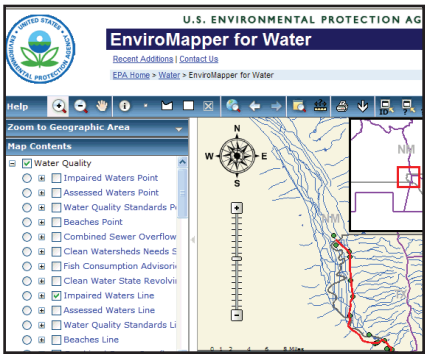


Where can I find out if the Rio Grande near my town is contaminated with bacteria?

Water quality and environmental information is available using EPA's interactive online tool, the **EnviroMapper for Water**, at http://www.epa.gov/waters/enviromapper/.

Texas impaired water bodies are listed at http://www.texaswaterdata.org under "Clean Water Act (CWA) Sections 305(b) and 303(d) Integrated Report." You can also find information and data about the Rio Grande Basin at the USIBWC Texas Clean Rivers Program website, http://www.ibwc.gov/CRP/Index.htm.

New Mexico impaired water bodies are listed at: http://www.nmenv.state.nm.us/SWQB/ under "303d-305b List Report."



Where can I find more information?

U.S.Environmental Protection Agency (EPA) Water Science http://www.epa.gov/waterscience/
EPA Adopt Your Watershed (local watershed groups and more) http://www.epa.gov/owow_keep/adopt/
New Mexico Environment Department http://www.nmenv.state.nm.us/
Texas Commission on Environmental Quality Surface Water Quality Monitoring http://texaswaterdata.org
Paso del Norte Watershed Council http://www.pdnwc.org/
Texas Clean Rivers Program for the Rio Grande Basin http://www.ibwc.gov/CRP/index.htm

Last Revision December 2010

This factsheet is a joint project between the International Boundary and Water Commission's Texas Clean Rivers Program (funded through the Texas Commission on Environmental Quality (TCEQ)), and the Paso del Norte Watershed Council's 319(h) program (funded through the New Mexico Environment Department's Surface Water Quality Bureau). The preparation of this report was financed through grants from and in cooperation with the TCEQ. Photo Credits: USIBWC, unless otherwise noted.