



## USDA-CSREES 2006 National Water Quality Conference

### Presence of Pathogenic Bacteria in the Surface Water of the Rio Grande Basin

The Rio Grande is used as a source of water for agricultural and residential use from its headwaters in Colorado down to the Gulf of Mexico. Since the Rio Grande Basin is the home to a large complex agriculture industry there has been interest in the presence and impact of pathogenic bacteria on the water supply in this basin. The focus of this study is to determine the presence of certain pathogenic bacteria in the surface waters of the Rio Grande Basin. The bacteria of interest are the following: *E. coli*, *E. coli* O157, *Staphylococcus aureus*, *Listeria monocytogenes*, *Vibrio* and *Salmonella*. Water and sediment samples were collected from nearly 60 sites along the Rio Grande from Colorado down to the Gulf of Mexico. These sites were in rural agricultural areas and within urban areas. The aliquots of the water and sediment were filtered and plated on CHROMagar selective media for each of the species of interest. These were incubated and then scored for the presence or absence of these organisms at the different collection sites. Presumptive isolates of *E. coli*, *E. coli* O157, *Staphylococcus aureus*, *Listeria monocytogenes*, and *Salmonella* were recovered from both the surface water and the sediment samples. Higher counts of these organisms were located from El Paso, TX down to the Gulf of Mexico. The Rio Grande in Colorado had *E. coli*, *Staphylococcus aureus* and *Salmonella*. In New Mexico presumptive *E. coli* O157 was added to this list as well. The Rio Grande from Albuquerque, NM upstream to the headwaters in Colorado had quite low numbers of bacterial pathogens. From Albuquerque, NM down to Canutillo, TX incidence of these pathogens was slightly higher but not statistically different ( $P=0.05$ ). The numbers of pathogens in the Texas section of the Rio Grande was significantly higher ( $P=0.05$ ), double or more of that in the lower New Mexico section. The highest numbers of pathogenic bacteria were recorded around El Paso, Laredo, Roma, and Brownsville, TX. *Vibrio* spp, were not isolated. The data show the impact of human population significantly increases the incidence of pathogenic bacteria in surface water within the Rio Grande Basin. This may result affect the future sustainability of water for agriculture and human uses.

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