

# The detection of antibiotic resistant bacteria (ARB) in the Gallinas River

Laurel Anna Carr (Dr. Ben S. Nelson, advisor)

Natural Sciences, New Mexico Highlands University

## Purpose of Study

The goal of this study is to identify whether or not it is possible to isolate antibiotic resistant bacteria (ARBs) in and around the Las Vegas, NM water supply in order to determine the source and possible solutions of this potentially life-threatening problem. By obtaining samples at the headwaters, the student researcher will be able to compare human and agricultural influences. Also, the student will monitor the input/output values of the Las Vegas water treatment plant and the reintroduction of water to the river from the wastewater treatment plant.

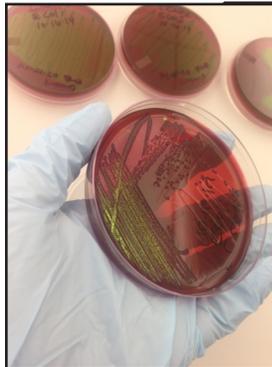
## Study Underway

The Gallinas River is exposed to varying amounts of human and livestock, with limited exposure at its headwaters to extreme exposure below the outfall of the city's wastewater treatment plant. Eleven sites, from the headwaters to the lower Gallinas River, representing varying levels of antibiotic presence, will be identified. Samples will be collected over a year and studied in the lab to identify antibiotic resistant bacteria. ARBs will be absent, or present in small numbers closer to the headwaters and gradually increase as collection sites move closer to human and agricultural influence. If ARBs are found to be present at or around the headwaters, consideration should be given to the agricultural influence of the livestock surrounding the area—possibly expanding the research by testing fecal matter in proximity to the water. Another potential explanation to the possible presence of ARBs close to the headwaters are due to the fish raised in hatcheries and then stocked for human consumption.

## Benefits

The community of Las Vegas, NM will benefit from knowing the presence of ARBs in their drinking water. Identifying the presence of ARBs in drinking water will confirm the risks the community is taking that interferes with safe and effective medical care and provides the public with information that may enable action that will provide for a healthy community, access to pure drinking water, and preservation of the surrounding environment.

*Escherichia coli (E. coli) was successfully isolated and grown on an Eosinmethylene blue (EMB) agar plate incubated at New Mexico Highlands University.*



*Laurel Carr and her adviser Dr. Nelson in the New Mexico Highlands University laboratory, the site of Laurel's research on the water analysis for antibiotic resistant bacteria.*

