

## Overview

The Rio Blanco watershed is located north of Guadalajara, in Jalisco, Mexico. It covers an area of about 60 mi<sup>2</sup>, and there are about 100,000 people currently residing within its boundaries. The water from Rio Blanco is currently used as a water source for those living in the area, as well as irrigation.

There are currently many problems with water quality within the watershed. Multiple point sources of pollution exist, which have severely degraded the water quality. Some of the pollution sources include:

- Fertilizers and pesticides from agricultural production
- Residential wastewater is drained directly into the river without treatment
- Cattle, chicken, and pig farms dump animal waste directly into the river
- Small factories and residents dump their waste directly into the river

This pollution is a serious problem for those who live in and around the Rio Blanco watershed. Since the 1960's there has been a drastic decline in wildlife along the river. Today, it is difficult to find any type of aquatic animal life. In the mid 1970's, the water quality began to decline rapidly, resulting in poor health and cholera outbreaks. To help resolve the problem, three water treatment plants have been built on the river, however, one is not working, one is operating at 45% capacity, and the other's effectiveness is not known. Another treatment plant with a capacity of 150 liters per second has been proposed, but nothing has been done due to the expense.

## Objectives

For this watershed, we will develop a water quality model, a runoff model, a GIS map, and come up with a preliminary proposal for water quality restoration for the watershed.

## Tasks

### Water Quality Model

Development of a water quality model will be done using the Stream Water Quality Model (Qual2K) developed by the Ecosystem Research Division of the US Environmental Protection Agency (<http://www.epa.gov/athens/wwqtsc/html/qual2k.html>). Using this model, we hope to be able to start developing complete water quality model for Rio Blanco. We realize that this, in of itself, is a huge task and do not expect to complete the entire model. However, we hope to have a good idea of what types of inputs are needed to run the model, and how to use the output data to help develop a plan of action for the watershed restoration.

### Runoff Model

A runoff model will be developed using HEC-1. This will be done to evaluate how water flows through the shed during a storm event. Data that will need to be collected to run the model includes:

- Average Precipitation for the basin
- Basin Base Flow
- Losses
  - Initial Abstractions
  - Infiltration
- Unit Hydrograph

## GIS Map

To develop a GIS map of the area, a Digital Elevation Map, watershed boundaries, land use and soil type data for the watershed, and the locations of pollution point sources will be needed. This data will be collected from websites or given to us by our counterparts in Mexico.

## Preliminary Proposal for Water Quality Restoration

Once the runoff model and GIS map are completed, we will evaluate the data and come up with ideas to improve the water quality in the Rio Blanco watershed. This will be done towards the end of the project (probably while we are working in Mexico). These solutions will not solve all the problems in the watershed, but they will be helpful and easy to implement.

## Schedule

Following is a schedule of events and what needs to happen to accomplish our objectives:

