Rio Boba Dominican Republic

The Problem:

The National Institute of Water Resources in the Dominican Republic (INDRHI) plans to construct a dam on the Rio Boba. In 1975 they began constructing 8 km of channel for irrigation purposes. The construction stopped in 1980 leaving just the channel. Our project is to analyze and determine whether or not it is feasible for INDHRI to construct a dam for irrigation, hydroelectric power generation, flood control, and drinking water.

Watershed is Located in Northern Part of Island

The Location:

Proposed dam location

Rio Boba
Dominican Republic

The Team:

The Team includes:
- **INDRHI Director: Fidel Perez**
- Sandra Jose Clases, INDRHI Engineer
- **BYU Director: Dr. E. James Nelson**
- James Peterson, EIT, Graduate Student
- Michael Burns, EIT, Graduate Student
- Guillermo Bustamante, Undergraduate Student

The Objectives:

The main objectives of the project were:
- Perform a water Balance for the region
- Determine PMP appropriate for the area
- Model flooding for a dam failure
- Calculate time it takes the dam to fill
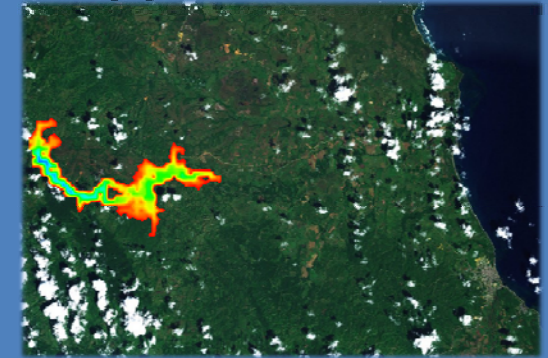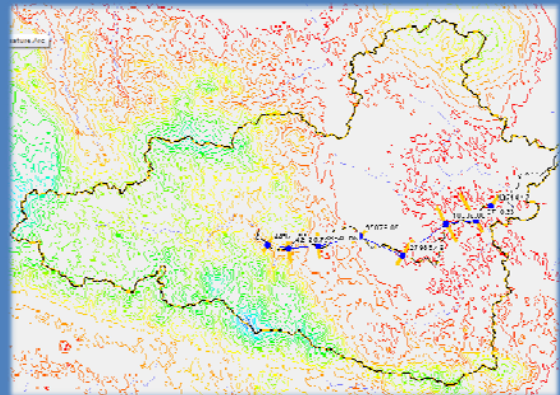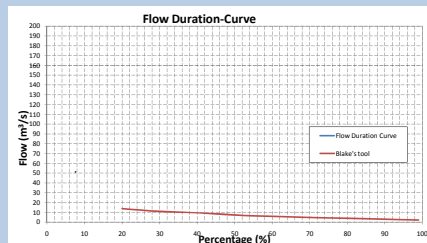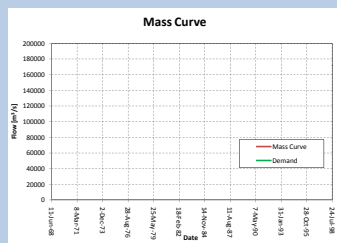- Teach INDRHI staff modeling techniques

The River:

The Rio Boba is a large river that conveys water from the country's highlands to the northern coast near Nagua, D.R.

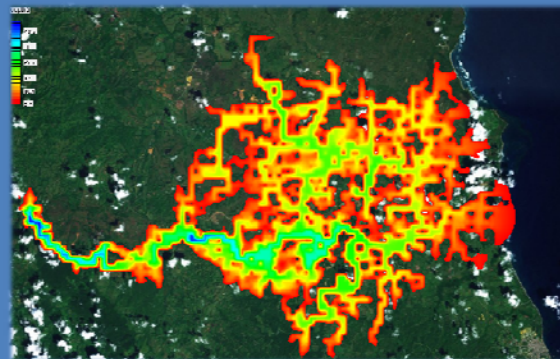## Channel Conditions:

Mass and Flow-Duration Curves:

Mass Curve

Flow Duration-Curve

Approach:

The data for rainfall and stream flow was collected from the Jenjibres station on the Rio Boba. ArcGIS was used to find the flow duration curve. Blake's tool was compared with the actual data collected. The Curve Number was obtained from HEC-HMS using soils and land use data. The mass curve shows that the capacity of the dam will satisfied the down stream water demands. A dam break simulation was done using a GSHAA model to determined the areas that would be affected and the time required for the flood wave to reach the down stream populations.

This map shows the flooding due to a dam failure 25 minutes after failure. The failure models were generated using WMS and a GSSHA flood model.

This map shows the delineated watershed and 2D cross sections at various stations

This map shows the flooding due to a dam failure 150 minutes after failure.

April 11, 20