Surface Analysis and Grain Size Distribution of Flood Deposits in the Eastern Himalayas

Introduction and Motivation

- The Siang River Valley in Northeast India preserves a record of Holocene floods, with deposits at elevations of 150 m above the modern river elevation.
- There was a well-documented flood from a landslide dam failure in 2000, with deposits at elevations from 30 - 40 m above the modern river elevation.
- To better interpret the ancient flood deposits I am characterizing the modern monsoon and 2000 flood deposits.
- To understand the implications for hazards and geomorphic evolution.

Overview Maps

Questions

- What is the grain size distribution of the flood deposits? Is there a fining of grain size as downstream distance increases?
- What is the spatial distribution of flood deposits, ancient, 2000 flood, and the annual monsoon, in relation to the mean annual river elevation?
- What is the source of both the ancient and 2000 flood deposits?

Methods

- Used Geographic Information Systems (GIS), like Google Earth, to determine spatial distribution of the flood deposits.
- Used Camsizer to determine the grain size distribution of the flood deposits.
- Work in Progress: Separating out 125 micron (0.125 mm) fraction and preparing thin sections for petrology.

The Monsoon and 2000 Flood Deposits are similar, are the Ancient as well?

- One would expect fining as distance downstream increases due to decrease in flow velocity, this is seen in the above plot.
- Sand size samples tend to be unimodal in distribution, which is shown in the above plot.

The Ancient Deposits are 150 m above River for ~150 km:

- The longitudinal profile shows the trim line caused by the 2000 flood; with an exponential trend line to interpolate the trim line for where data was not collected.

So were the ancient floods bigger or did the river incise?

- Further work needs to be done to determine if the ancient flood deposits are at a higher elevation due to a larger flood(s) or due to incision of the river bed. However, we are talking about 100 - 150 meters of erosion which would require 10 - 15 mm/yr of erosion for ~10,000 years. This seems unreasonable to myself and others.