# Mono Lake North Geomorphic Mapping

## Materials:

printed base map (topographic and aerial image), tracing paper, GPS (optional), colored pencils, hand lens, pencil/eraser, mapboard, rulers, measuring tape,compass, stadia rod, transit

## Goals:

1. Learn how to identify fluvial geomorphic landforms in the field and in remote imagery and represent them on a geomorphic map.
2. Employ relative dating techniques in order to determine order of events
3. Measure stream and terrace offsets in order to interpret the stream development/history in this location (tell a story about falling lake level, base level change, etc).
4. Make connections between age of geomorphic feature/soils and vegetation(?)

## Activity:

### Part 1 – Mapping (1-2hr)

1. Define reaches along the main stream channel identifying components (riffles, pools, etc), vegetation types, general description of bedload.
2. In the field, identify multiple terrace risers, describe each (sediment type, vegetation, elevation above current channel)
3. Draw a sketch of the stream in your field notebook (two full pages suggested) noting important components, reach boundaries (if necessary), and river terraces.
4. Using the aerial imagery, locate yourself and identify the part of the stream you are mapping. Locate the terrace risers on the aerial imagery. Using the same geomorphic map begun in the Mono North: Geomorphic History, add the locations of any river terraces or botanical transects in your mapping area.

### Part 2 – Surveying (~2-3hr)

1. Set up surveying tripods, transits, and measuring tapes in advance of the activity to have a view of the stream reach to be mapped AND the terraces where the botany transects and geomorphic mapping occurs. For this part of the activity it works well to have students work in groups of 2-3 to each measure one profile. As the class will rotate through the stations, there should be at least 3 measurements of each profile for comparison. Make measurements along two roughly perpendicular profile lines:
   1. Channel slope (longitudinal profile through reach of interest
   2. Profile across channel (can do in multiple locations) from T3 on one side of the channel to T3 on the other side of the channel
   3. Profiles on each terrace parallel to the river (aiming to measure terrace slope). We made the measurements along the botanical transect lines simply so we could use the same tape measures.
2. Add the survey station locations to your geomorphic map as well as the location of the profile lines and other field sites (stratigraphy, geomorphic mapping vantage point, stream reach mapping, botany transects). At the end of the field day(s) this map should have all relevant information for the various activities: transect lines, profile lines, field sites, stream gage location, etc in addition to the geomorphic units (river terraces, paleoshorelines).

## Hand In:

1)   Map view interpretation of channel reaches and terraces

2)   Data Table with characteristics of each reach/terrace.

3)   1-2 paragraph interpretation (and/or drawing) of possible scenarios resulting in this current stream configuration.

## Note:

We had them plot the survey data, but not until the final project part. They should at least, from the survey data, calculate the slopes of the river and terraces as well as the offsets of each terrace above the current channel. We used it as an opportunity to have students practice plotting and comparing data collected by different students. It also pairs will the hydrology data as stream geometry was important for discharge calculation.