



## **Relationship between catchment events (earthquake and heavy rain) and sediment core analysis result in Taiwan.**

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Lake sediments contains material from the catchment. In those sediments, there are some features which can indicate characteristic or status of the catchment. These features were formed by different mechanisms, including some events like earthquakes or heavy rain, which are very common in Taiwan. By analyzing and discussing features of sediments there is a chance to identify historical events and rebuild catchment history.

In this study, we compare features of sediment core ( including density, mineral grain size, whole grain size, and biogenic silica content) and earthquake, precipitation records. Sediment cores are collected from Emerald peak lake (24.514980, 121.605844; 77.5, 77.2, 64cm depth), Liyutan lake (23.959878, 120.996585; 43.2, 78.1 cm depth), Sun Moon Lake (23.847043, 120.909869; 181 cm depth), and Dongyuan lake (22.205742, 120.854984; 45.1, 44.2cm depth) in 2014.

We assume that there are regular material and organic output in catchments. And rain will provide impetus to move material into lakes. The greater the rain is the larger the material can move. So, if there is a heavy rainfall event, grain size of lake sediment may increase. However, when earthquakes happen, it will produce more material which have lower organic composition than ordinary. So we suggest that after earthquakes there will be more material stored in catchment than often. And rainfall event provides power to move material into lakes, cause more sediment and mineral content higher than usual.

Comparing with earthquake record(from 1949, by USGS) and precipitation record(from 1940, by Central Weather Bureau,Taiwan), there were few earthquakes which happened near lakes and scale were more than 7 ML. There were 28 rainfall events near Emerald peak lake; 32 near Liyutan lake and Sun Moon Lake; 58 near Dongyuan lake ( rainfall event: >250 mm/day ). In sediment analytical results, ratio of whole and mineral grain size indeed have similar trends with earthquake record. However, rainfall events were too frequent to determine the relation between rainfall events and sediment analyze results, that may be obstruction of attempt to speculate the extent of earthquake events.