

## **Active deformation of coastal and fluvial terraces by the blind Miaoli Frontal Structure in the Miaoli coastal area, western Taiwan**

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The island of Taiwan is located at the convergent boundary between the Eurasian and the Philippine Sea plates. The ongoing collision between the Luzon arc and the Eurasian continental margin produced the Taiwan mountain belt. Many active faults have been identified and mapped in Taiwan, but in the Miaoli coastal area in western Taiwan, no active fault has been officially mapped, albeit the hilly areas extend all the way to the coast. Based on our geomorphic mapping using a 5-m resolution digital elevation model (DEM), we identified widely distributed high level terraces in the Miaoli coastal area. We suggest that these terraces are produced by coastal uplift related to a blind Miaoli frontal structure. The presence of these terraces clearly indicates that this blind frontal structure is recently active. Other than the high level terraces, we also identified two groups of river terraces. The northern group is located along the Xihu River. Since the surface sediments on the terraces are all less than 10 m thick and the river has cut down into the bedrock, we suggest that all these terraces are strath terraces and indicate tectonic uplift on the hanging-wall block of the Miaoli frontal structure. Based on the distribution and deformation of the terraces, we also found that two E-W striking faults, the Futoukeng fault and the Lungkang fault, are likely active as well. Both faults may merge with the Miaoli frontal structure near the coastline. The southern group of terraces are along the Tongxiao River, and are also likely produced by the uplift of the Miaoli frontal structure. Therefore, this structure appears to be an important active structure of western Taiwan, and may pose significant seismic hazard to the area.