東勢活動背斜

中央大學地球科學系，野外地質學實習 2007/3/17

地點：苗栗縣卓蘭鎮南側之大安溪河床

附註：1. 自備午餐與開水

2. 7:30 AM 出發

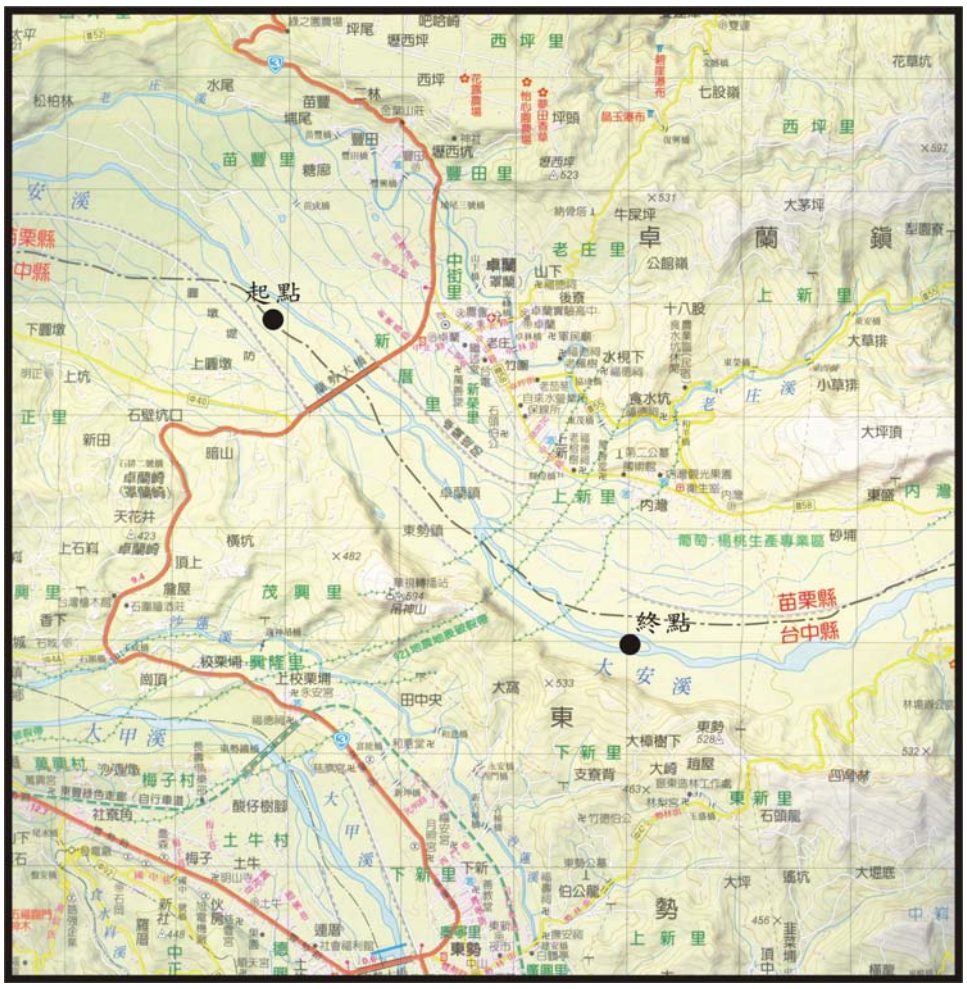
一、 目的

此次的地質考察主要目的為：

A. 地形圖與地質圖判識
B. 熟習 Brunton compass
C. 定位
D. 觀察、測量與紀錄各露頭的岩性、原生構造及次生構造
E. 利用於東勢背斜兩翼所量測的岩層位態，求出背斜軸的位態

實習路線(約 4 公里)

沿著大安溪河床，約在蘭勢大橋附近往上游前進，約 4 公里後到達東勢背斜軸軸部，續往上游前進，進入背斜東翼，再往上游走數百公尺即到達終點。起迄地點約為：起點 x=230000 m, y=2690000 m；終點 x=233000 m, y= 2687000 m。



東勢活動背斜與卓蘭層

A large earthquake (M_w=7.6) occurred in west-central Taiwan in 1999 with its epicenter near the small town of Chichi (23.85°N, 120.82°E) and the focal depth is about 8 km. The Chichi rupture took place mainly along the north-south stretch of the Chelungpu Fault of about 100 km long and cuts mainly along and within the Chinshui Shale. At the northern segment of Chichi rupture at Shihkang township, the rupture turns to an easterly direction and cut stratigraphic upsection and across the strike of the Cholan Formation.

The Cholan-Neiwan area is located near the north-eastern end of the surface ruptures of the 1999 earthquake. This stop provides an opportunity for examining the Chichi ruptures that form in a conjugate pair and help to "push up" the Tungshih anticline (Figure 1), a decollement fold, as well as examining the coastal sediments of the Cholan Formation that were accumulated during the later stage of the foreland basin development.

In the Cholan-Neiwan area, three major surface ruptures were mapped. Two major NE-SW trending thrusts and one major backthrust, formed in a 2 km wide fault zone (Fig.1). The vertical offsets of the individual faults are approximately 1m, 1.5m, and 5-6m for the two major thrusts and the major backthrust (respectively from west to east).

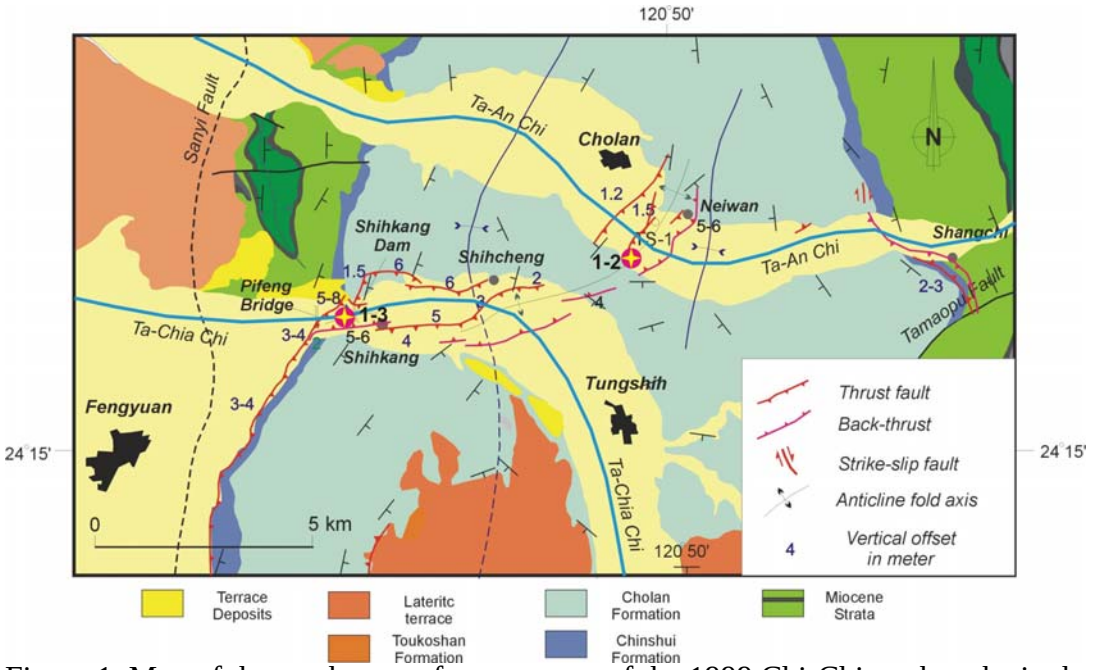


Figure 1. Map of the northern surface ruptures of the 1999 Chi-Chi earthquake in the Shihkang-Shangchi fault zone (after Lee et al., 2002). The vertical displacements observed on the fault scarps are shown as numbers on the map. Note that the earthquake surface faults as well as the local young folding structures (trending E-W to NE-SW) within the Cholan Formation have obliquely cut across the regional old anticlinal and synclinal fold structures (trending N-S). Field stops are shown as red circles with stars.

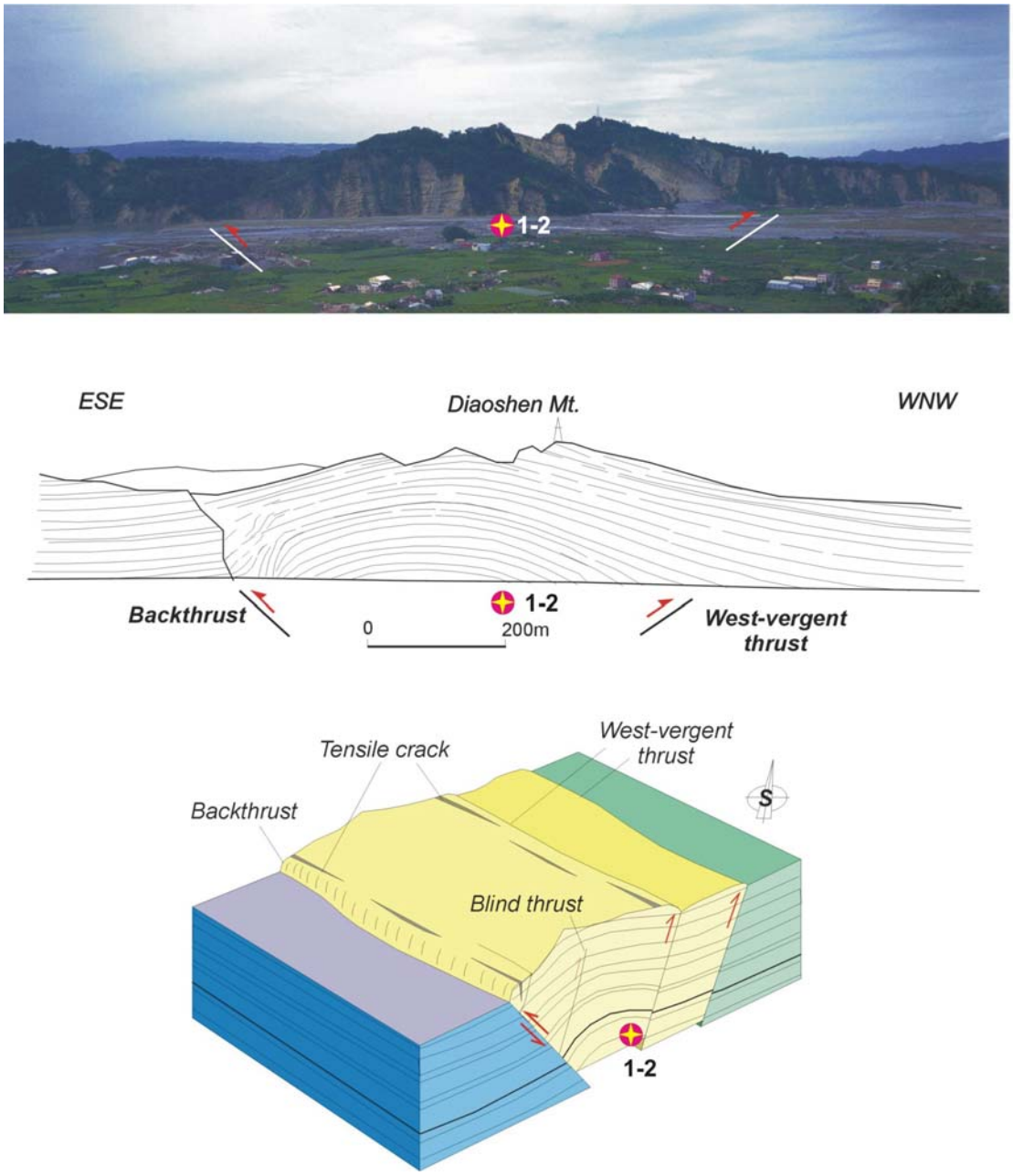


Figure 2. Stop 1-2. Pop-up structure with thrust-and-backthrust system situated on a pre-existing anticlinal fold, the Tungshih anticline, in the Diaoshenshan area near Neiwan (after Lee et al., 2002). Field stop is shown as red circle. The major thrust of the 1999 earthquake occurred along the backlimb (i.e., left of the above figures) of the Tungshih anticline. The gentle open fold of the Tungshih anticline probably is part of contribution of several recent earthquakes in a time span of tens of thousand years.