

斷層活動性觀測研究第五階段(2/5)

Active Fault Observation and Research on Earthquake Potential, fifth phase (2/5)

經濟部中央地質調查所

摘要

本年度利用野外地質調查方法，針對大茅埔-雙冬斷層南段(烏溪以南)及觸口斷層進行活動斷層條帶地質圖精進與繪製。其次，完成初鄉斷層、車瓜林斷層、利吉斷層地下地質探查，共計進行了 13 孔、5 個剖面及獲取 1,230 公尺的鑽井岩心。依據「地質法」初審車瓜林斷層活動斷層地質敏感區。此外，因應 4 個地震規模大於 6 的地震事件，進行地質調查與測量工作，並公開地震地質調查報告，分別為 0323 長濱地震(規模 6.7)、0620 光復地震(規模 6.0)、0917 關山地震(規模 6.4)及 0918 池上地震(規模 6.8)。

此外，運用 GNSS 定期性測量、精密水準測量、GNSS 連續追蹤站、PS-InSAR 持久性散射體的合成孔徑雷達差分干涉資料觀測斷層的活動性外，配合地質調查、數值分析等方法，建構三維塊體數值模型，由 GNSS 所觀測到的地表變形結果進行運動學分析，計算各區域內斷層的滑移速率及再現週期，分年分區（依南部、嘉南、東部、中部、北部順序）評估斷層的活動潛勢，最後完成活動斷層的潛勢機率圖繪製，本年度完成嘉南地區斷層潛勢分析及評估（包含九芎坑斷層、梅山斷層、大尖山斷層、觸口斷層、木屐寮斷層、六甲斷層、新化斷層、後甲里斷層、左鎮斷層、口宵里斷層等區域）。

今年除持續辦理定期性觀測外，每日透過網路與觀測站連線，不斷地接收、處理、解算和分析觀測站資料，加密並補強觀測網，透過彙整各觀測站的資料，分析斷層的活動特性，對觀測資料同步異常情形進行分析與評估，希望藉由本計畫的觀測工作，評估斷層之活動潛勢。

此外，持續彙整活動斷層調查與觀測資料，在網路上公開活動斷層相關資料，方便民眾於網路直接查詢獲取相關資訊，也期望這些成果可作為活動斷層地質敏感區劃定的參考，並提供防、減災的重要資訊，減低地震來臨對社會造成的災害。

The CGS used geological survey methods to complete the geological mapping of the southern segment of the Tamaoupu-Shuangtung Fault and Chukou Fault. Furthermore, the underground geological surveys of the Chuhsiang Fault, Chekualin Fault, and Lichi Fault were completed, resulting in a total of 13 boreholes (including 2 sites along the Chuhsiang Fault, 1 site along Chekualin Fault, and 2 sites along Lichi Fault). This project established 1230 meters of drilling data, 17 sets of C-14 dating, and five geological cross sections, furthering the delineation and announcement of geologically sensitive area for Chekualin Fault. In addition, in response to earthquakes of magnitude 6 or greater in eastern Taiwan, the Central Geological Survey conducted geological surveys and completed Geological Survey Reports for the 0323 Changbin Earthquake, 0620 Guangfu Earthquake, 0917 Guanshan Earthquake and 0918 Chishang Earthquake.

In the 2021 project, we focused on the improvement of fault parameters and earthquake probability assessment in three important regions: Tainan Science Park, Shalun Green Energy Science City, and the Tainan metropolitan area of southwest Taiwan.

In order to supply the surface velocity field for this project, we examine the geodetic data from the island-wide continuous and campaign GNSS networks, precise leveling lines, and PS-InSAR. We also improved the fault parameters and earthquake probability assessment of the ten active faults (Chiuchiungkeng fault, Meishan fault, Tachienshan fault, Chukou fault, Muchiliao fault, Liuchia fault, Hsinhua fault, Houchiali fault, Tsochen fault, and Kouhsiaoli fault) in southwest Taiwan by inverting the surface velocities to estimate the slip rate deficit.