

摘要

關鍵詞：環境地質、電子化政府、雲端應用、資料庫、開放資料

本計畫配合政府的「服務型智慧政府推動計畫」推動「發展跨機關一站式整合服務」，已建立一個潛在大規模崩塌及環境地質資訊發布與共享的雲端三維平臺「山崩雲端圖資展示平臺」，將經濟部中央地質調查所歷年來於地質資料收集、環境地質與山崩等地質災害之調查研究，視覺化的展示，並提供開放資料格式及一站式資料申請服務，以提升全民對地質災害的敏感度，以及國人的防災意識。

賡續上年度的成果，本年度有 7 項工作：首先配合本年度國家發展委員會之要求與規範增修資料交換標準及作業流程，並持續擴建與維護山崩地質雲端服務資料，本年度針對現有資料庫中之歷史山崩目錄共 204 項進行全面更新，並增加 GeoJSON-LD 結構描述，以符合開放資料四星標準。於擴建雲端圖資展示平臺中，配合莫拉克風災十周年回顧，製作主題應用系統，增加莫拉克風災之區域空間位置、崩塌地說明、今昔照片及三維崩塌地地形展繪，該三維光達崩塌模型無需外掛其他軟體，即可在等待下載後直接於瀏覽器中自由操作及觀看該模型。擴建圖資展示功能，新增自訂圖層顏色功能，讓使用者依其需求調整資料圖層顯示，得以針對不同圖層設定顏色助於辨識。亦配合單位臨時性任務擴建非定期展示主題服務功能，提供臺南市敏感區審議委員可透過本平臺，在帳號管理權限下觀看並可取得特定資料圖層。另為支應其他分支計畫使用本平臺資料及圖層展示功能，擴建多樣化雲端服務交換平臺中，更新「五萬分之一全島地質圖」及「地形陰影圖」約 833 萬張圖磚。

於下半年發布「100 年期距岩屑崩滑崩壞比圖」、「岩屑崩滑危害度分級圖」並配合展示額外發佈「山崩與地滑地質敏感區」及「順向坡目錄」等輔助圖層，產出圖磚約 529 萬張。為提升雲端圖資展示平臺之展示效能，本團隊採用混合式圖磚作為系統圖層視覺展示，該方式結合傳統圖磚可大量展示資料之優點，及向量圖磚中及時呈現屬性資料之特色。資料儲存方面利用空間換取時間，故於雲端機房設備租用中增加 2TB 儲存空間以支應圖資服務使用。資訊安全方面完成三季之弱點掃描，並透過維

護雲端服務管理平臺監控系統的使用量及來訪人次。成果推廣與增值應用方面，上半年參與「臺北國際防火防災應用展」，「2019 臺灣地球科學聯合學術研討會」兩場學術專業之國際推廣展示活動，受邀至中國文化大學地質系進行校園推廣，並於科工館參與「莫拉克十週年大規模崩塌地質防災資訊成果發表會」發表本年度計畫成果，最後於地調所內擴大舉行技術轉移教育訓練共 3 小時。

ABSTRACT

KEYWORDS: Environmental geology, e-Government, Cloud Applications, Databases, Open Data, Service-Oriented Architecture

This plan followed the government's Service-oriented Smart Government Promotion Plan to promote Development of one-stop integrated services across agencies. A Landslide Cloud Map Data Display Platform was established. This platform serves as a cloud three-dimensional platform which can be used to release and share the potential large-scale landslides data and environmental geological information. The platform can visualize the integrated data including the geological datasets, environmental geological data, and landslide data from investigations and researches, which were collected by Central Geological Survey of the Ministry of Economic Affairs in the past years. It also provides open data formats and one-stop data application services. It can promote the public sensitivity to geological disasters and awareness of disaster prevention.

Continuing the achievements of the previous year, there are 7 tasks in this year. First of all, in accordance with the requirements and specifications of the National Development Committee this year, we have revised the data exchange standards and operating procedures, and continued to expand and maintain the landslide geological cloud service data. This year, a total of 204 historical landslide catalogs in the existing database were comprehensively updated. Moreover, the system has added GeoJson-LD structure description to meet the open data four-star standard. In the expanded Cloud Map Data Display Platform, in conjunction with the tenth anniversary review of the Morakot typhoon disaster, a theme application system was produced. It adds the spatial location, description of collapsed areas, past and present photos, and three-dimensional visualization of collapsed terrain in Morakot typhoon disaster. The 3D point cloud model, without any plugged-in software, can be freely operated and viewed in the browser after download. The system expands the map data display function, adding a tool for customizing layer colors. It allows users to adjust the data layer display according to their needs, with setting colors

for different layers for better identification. We also cooperate with the organization's temporary task to expand the non-scheduled theme demonstration service. Therefore, we provided Review Committees for Sensitive Districts of Tainan City to view and obtain specific data layers through this platform under account management authority. And in this year, with expanding the Diversified Cloud Service Exchange Platform, we updated the 1:50,000 geological map of the whole island and hillshade map, with a total of about 8.33 million map tiles.

In the second half of this year, we released the 100-year return-period shallow landslide probability map, shallow landslide hazard map. We also cooperated with the exhibitions to release the additional auxiliary layers of landslide geologically sensitive area, and dip slope catalog. It produced totally about 5.29 million tiles. In order to improve the display performance of the Cloud Map Data Display Platform, our team adopted hybrid tiles as a visual display layers of the system. This method combines the advantages of a large number of traditional tiles to display data, and the characteristics of timely presentation of attribute data in vector tiles. For data storage, we strategically use space for time. Therefore, 2TB of storage space is added to the rental of cloud data center equipment to support the use of map services. In terms of information security, we have completed three quarterly vulnerability scans, and monitored the system usage and visits by cloud service management and maintenance platform. In terms of results promotion and value-added applications, in this year we participated in the 18th Fire & Safety Expo and the 2019 Taiwan Geoscience Assembly. We have also been invited to the Department of Geology, Chinese Cultural University for campus promotion, and participated in the 10th anniversary of Morakot disaster and large-scale landslide disaster prevention information conference at the Science and Engineering Museum to announce the results of this year's plan. At last, a total of three hours of technology transfer education and training were held within the organization.

