全國海洋資料整合應用工作坊

使用研究資料寄存服務管理與共享無人載具影像及公共工程生態檢核資料

王豫煌 (yuhuangwang@gmail.com)，台灣生態學會
莊庭瑞，中央研究院資訊科學研究所
林誠謙、嚴漢偉，中央研究院網格計算專題中心

2019-08-29
台北市福華文教會館

無人載具應用

Lightweight unmanned aerial vehicles will revolutionize spatial ecology

Karen Anderson* and Kevin J Gaston

Ecologists require spatially explicit data to relate structure to function. To date, heavy reliance has been placed on obtaining such data from remote-sensing instruments mounted on spacecraft or manned aircraft, although the spatial and temporal resolutions of the data are often not suited to local-scale ecological investigations. Recent technological innovations have led to an upsurge in the availability of unmanned aerial vehicles (UAVs) – aircraft remotely operated from the ground – and there are now many lightweight UAVs on offer at reasonable costs. Flying low and slow, UAVs offer ecologists new opportunities for scale-appropriate measurements of ecological phenomena. Equipped with capable sensors, UAVs can deliver fine spatial resolution data at temporal resolutions defined by the end user. Recent innovations in UAV platform design have been accompanied by improvements in navigation and the miniaturization of measurement technologies, allowing the study of individual organisms and their spatiotemporal dynamics at close range.

Front Ecol Environ 2013; 11(3): 138–146, doi:10.1890/120150 (published online 18 Mar 2013)

remote sensing

MDPI

Review

On the Use of Unmanned Aerial Systems for Environmental Monitoring

Salvatore Manfreda [1,*], Matthew F. McCabe [2], Pauline E. Miller [3], Richard Lucas [4], Victor Pajuelo Madrigal [5], Giorgos Mallinis [6], Eyal Ben Dor [7], David Helman [8], Lyndon Estes [9], Giuseppe Ciraolo [10], Jana Müllerová [11], Flavia Tauro [12], M. Isabel de Lima [13], João L. M. P. de Lima [13], Antonino Maltese [10], Felix Frances [14], Kelly Caylor [15], Marko Kohv [16], Matthew Perks [17], Guiomar Ruiz-Pérez [18], Zhongbo Su [19], Giulia Vico [18] and Brigitta Toth [20,21]

drones

MDPI

Review

Drones for Conservation in Protected Areas: Present and Future

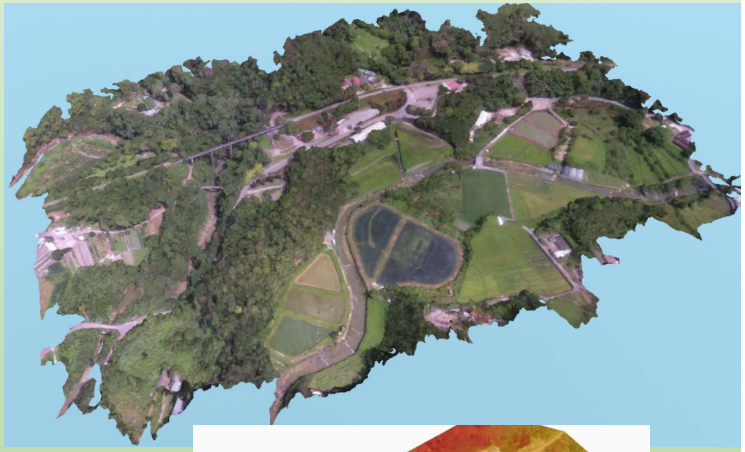
Jesús Jiménez López [1,*] and Margarita Mulero-Pázmány [2,*]

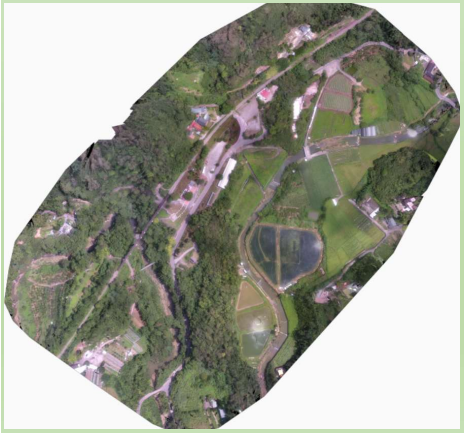
1 MARE—Marine and Environmental Sciences Centre, Quinta do Lorde Marina, Sítio da Piedade, 9200-044 Caniçal, Madeira Island, Portugal
2 School of Natural Sciences and Psychology, Liverpool John Moores University, Liverpool L3 3AF, UK
* Correspondence: lopezjimenezjesus@mare-centre.pt (J.J.L.); M.C.MuleroPazmany@ljmu.ac.uk (M.M.-P.)

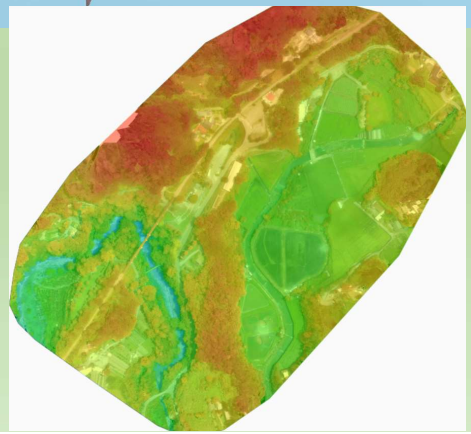
Received: 30 October 2018; Accepted: 7 January 2019; Published: 9 January 2019

UAV航攝影像資料

- 正射影像(Orthomosaics)
- 影像圖磚(Google Earth/Maps tiles)
- 地表/高程模型(Digital surface/terrain models (DSM / DTM)
- 3D 點雲(point cloud)
- 3D 網格材質模型(mesh model)





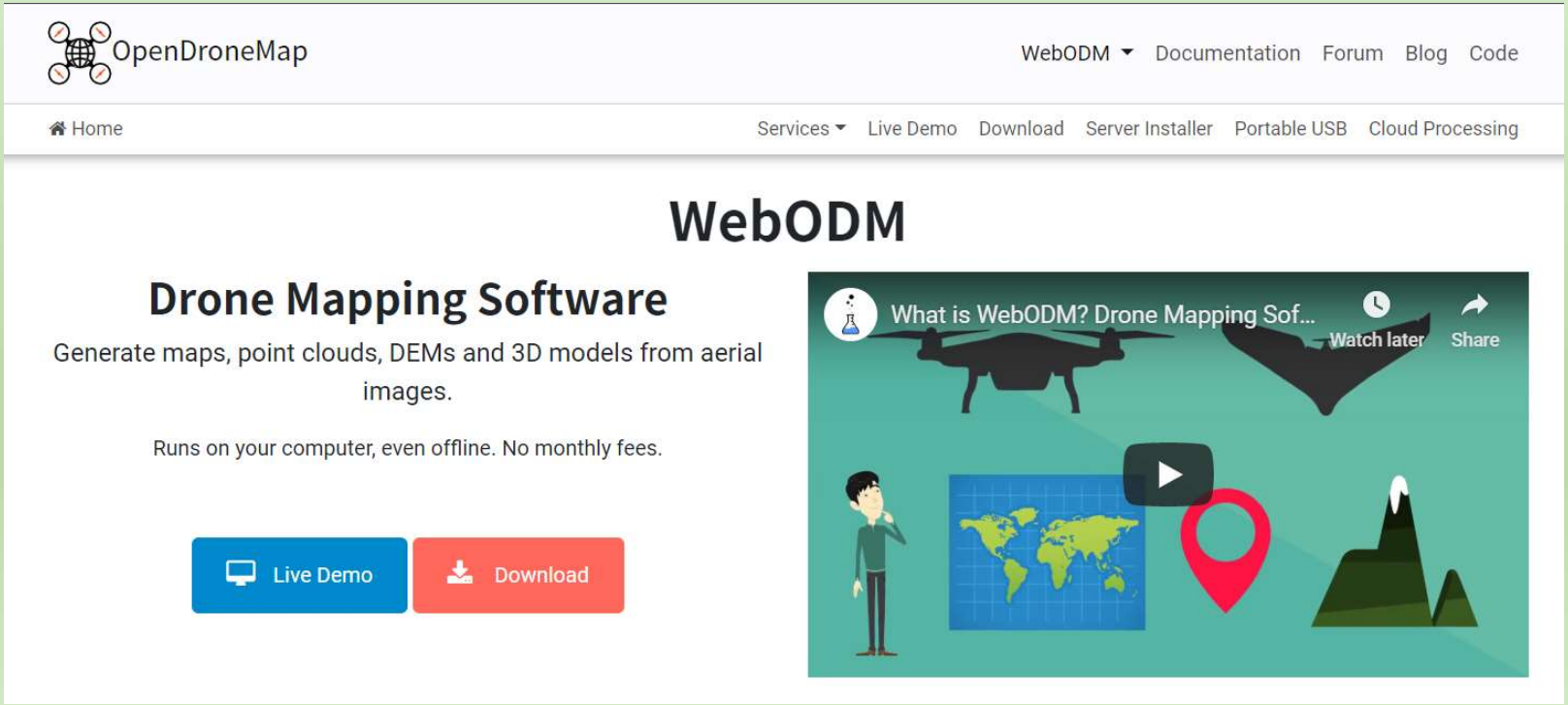


UAV資料共享平台

資料類型	共享平台	附註
正射影像	OpenAerialMap	開放、免費。
影像圖磚	?	?
地表 / 高程模型	?	?
3D 網格材質模型	Sketchfab	免費帳號可上傳小於50MB per scene的檔案。
3D Map	Melown Cloud	免費帳號有2GB儲存容量，每月3,000次地圖瀏覽(map views)，無法下載地圖。
3D 點雲	PointScene	免費帳號可上傳小於50M points per scene的檔案，僅開放基本瀏覽功能，無法下載資料，無量測功能。

開放原始碼影像處理工具與資料共享平台

- OpenDroneMap (ODM)
- Web ODM



WebODM GitHub

README.md

WebODM

build passing version 1.1.0

A user-friendly, extendable application and API for drone image processing. Generate georeferenced maps, point clouds, elevation models and textured 3D models from aerial images. It supports multiple engines for processing, currently ODM and MicMac (experimental).

Orthomosaics

Georeferenced, orthorectified maps.

3D Models

3D models and point clouds in a variety of formats.

Export

High resolution GeoTIFF, PNG, LAS, OBJ formats.

Elevation Models

Easily generate georeferenced DSMs/DTMs.

Measurements

Make volume and area measurements with ease.

Rebrand

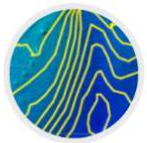
Choose a logo and color scheme that matches your organization.

Ground Control Points

Create and use GCPs for additional accuracy.

Share

Easily share your maps and 3D models.



Contours

Preview and export elevation contours to AutoCAD, ShapeFile, GeoPackage.

Scale

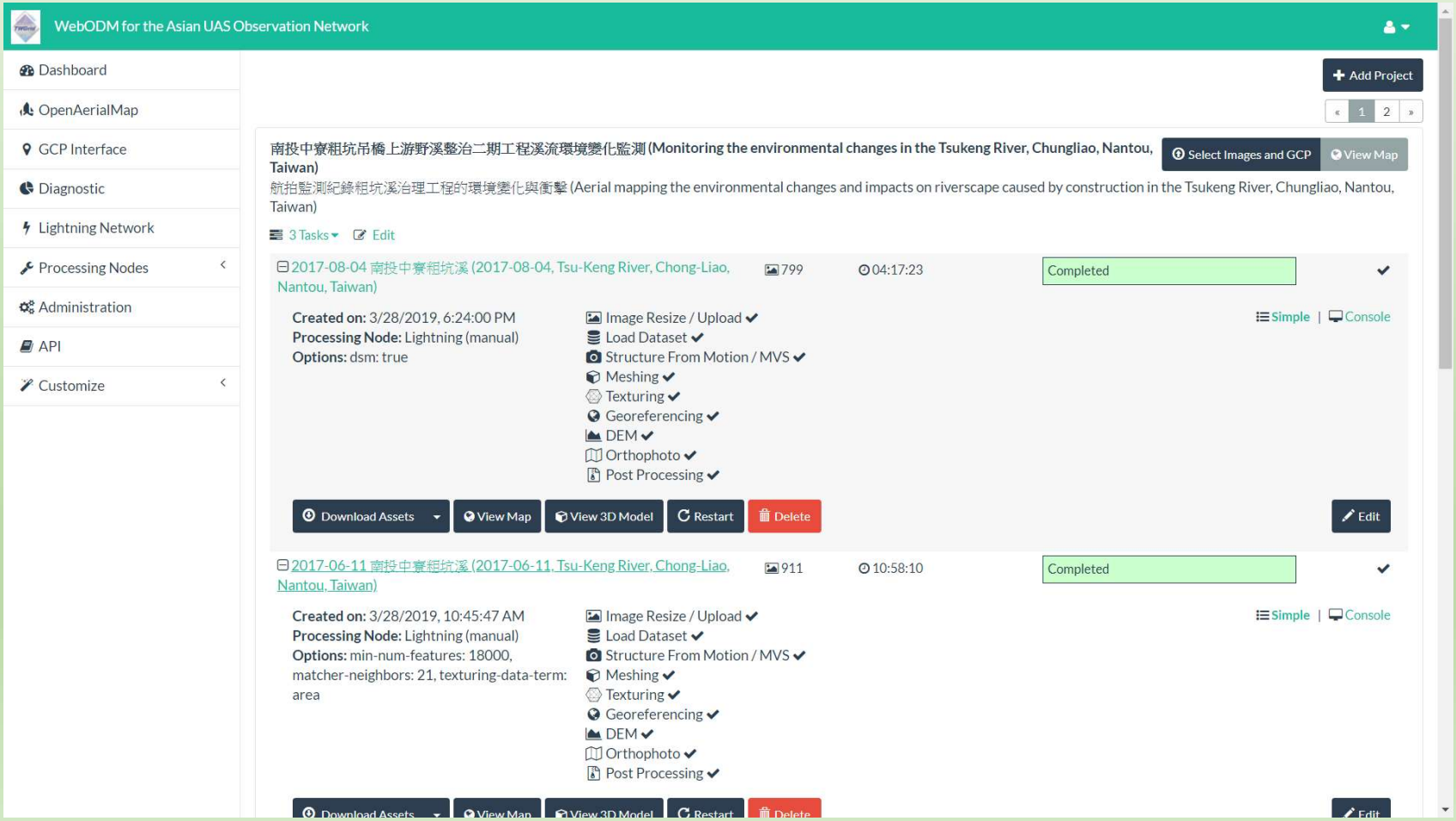
Run multiple jobs in parallel, on your own infrastructure.

成果資料管理與共享

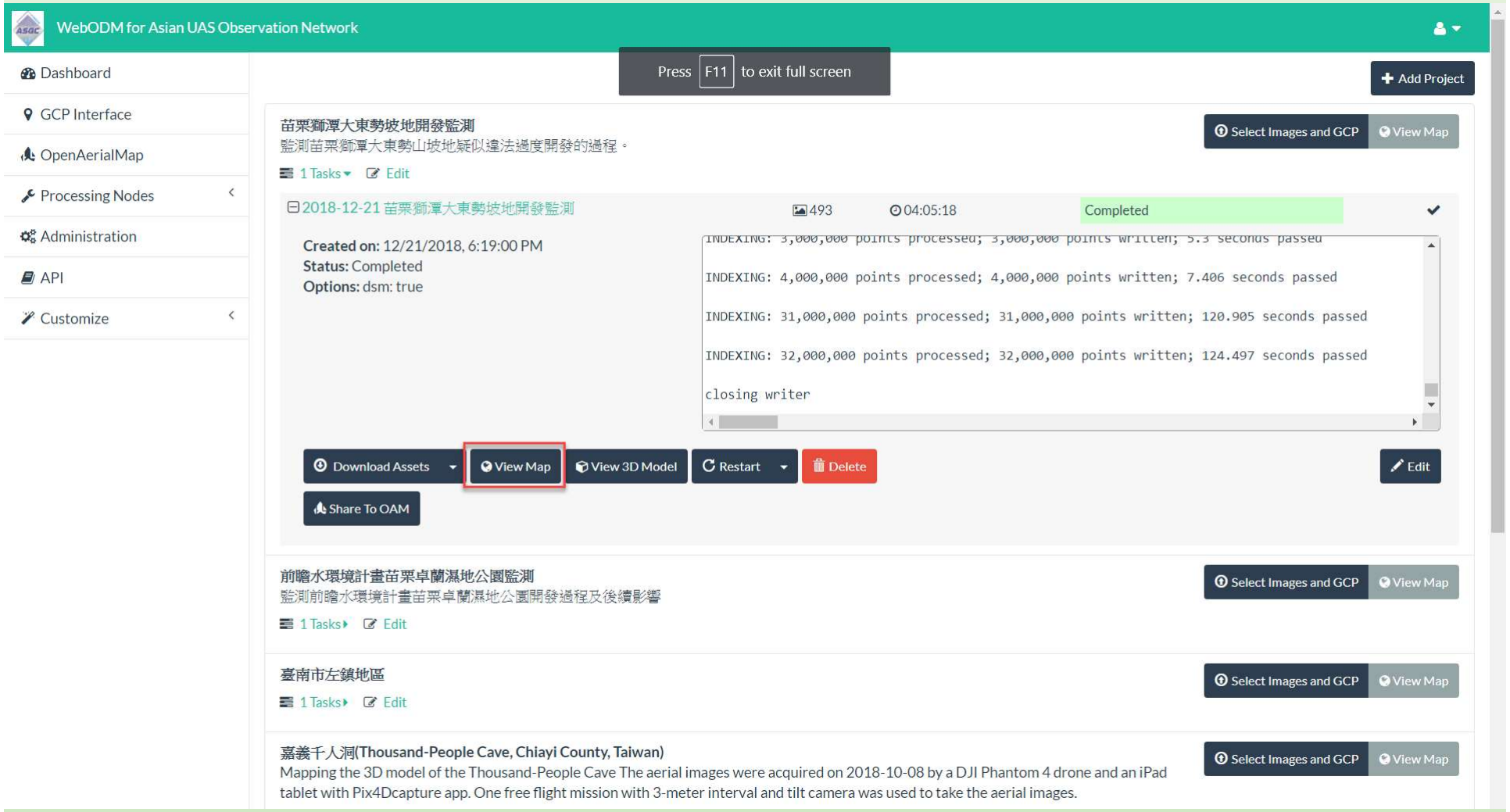
- 中央研究院網格計算專題中心WebODM - 無人載具航攝影像計算與成果共享
- OpenAerialMap (OAM) - 正射影像開放資料平台
- 中央研究院研究資料寄存所 - 紀錄、保存無人載具觀測詮釋資料、原始影像及相關成果資料

ASGC WebODM

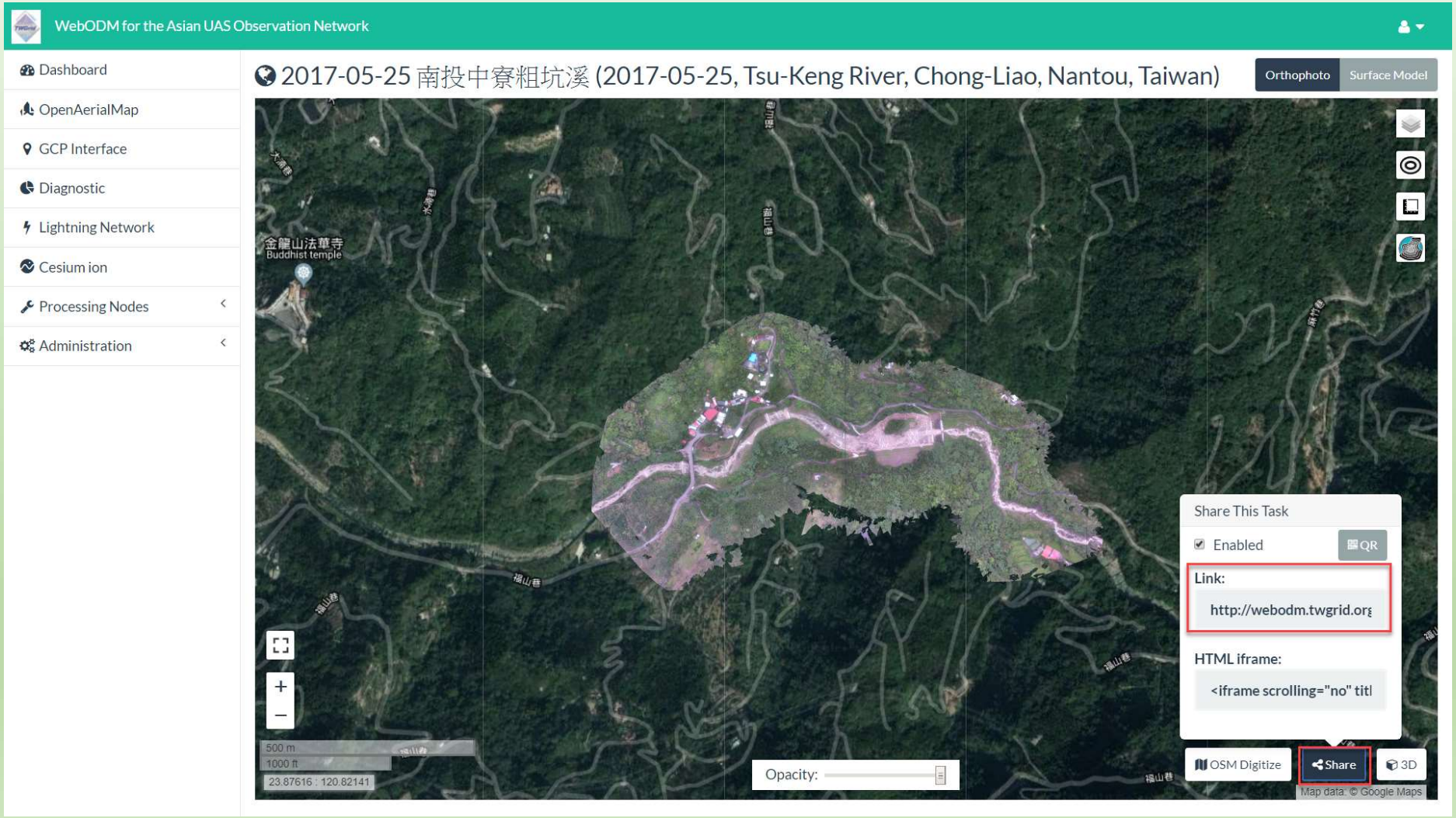
- 無人載具航攝影像處理開放平台 - 以開放共享觀測資料為前提，提供免費資料處理雲端服務。



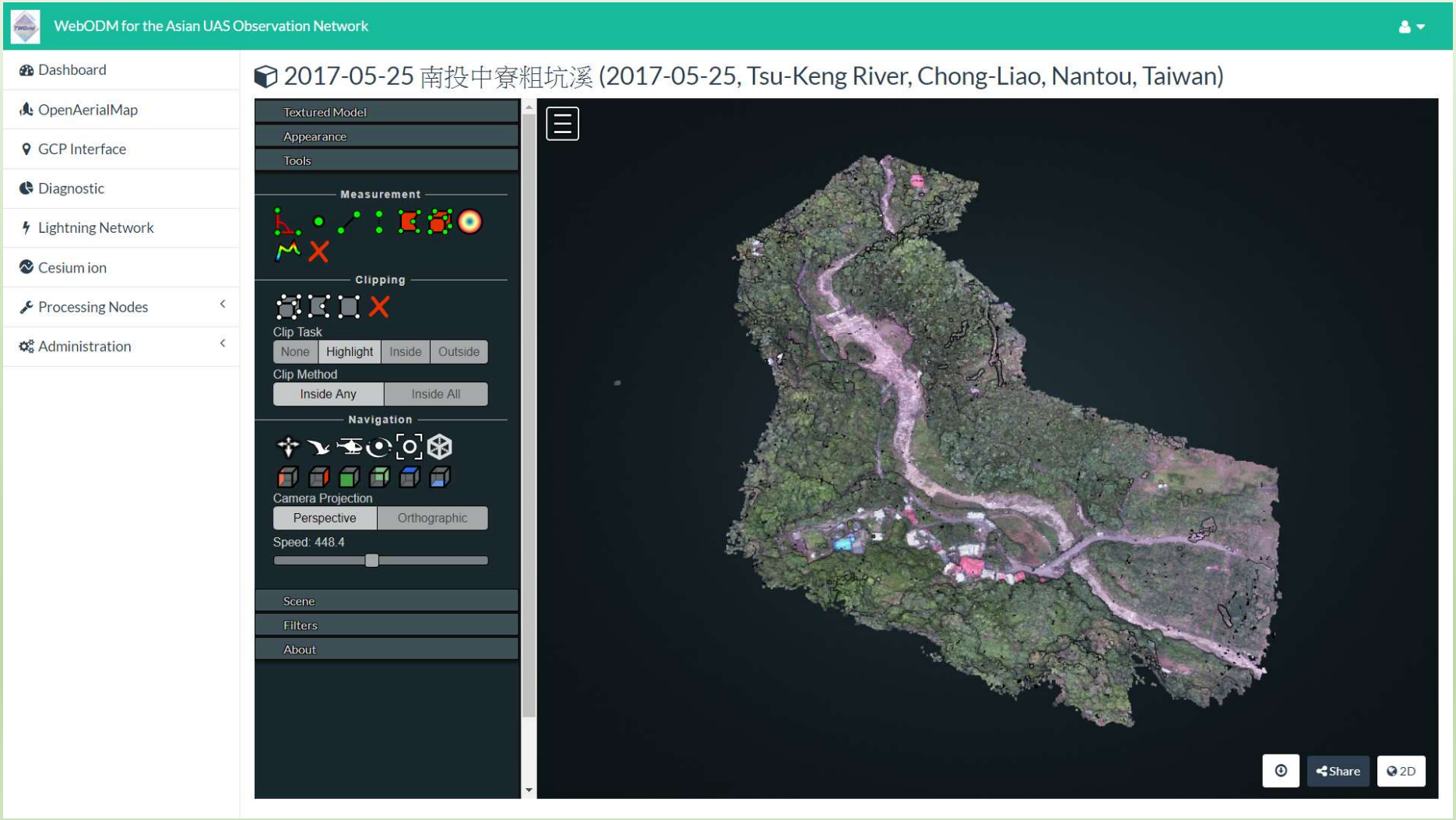
WebODM管理介面


WebODM for Asian UAS Observation Network
Dashboard
GCP Interface
OpenAerialMap
Processing Nodes
Administration
API
Customize
Press F11 to exit full screen
Add Project
苗栗獅潭大東勢坡地開發監測
監測苗栗獅潭大東勢山坡地疑似違法過度開發的過程。
Select Images and GCP
View Map
1 Tasks
Edit
2018-12-21 苗栗獅潭大東勢坡地開發監測
493
04:05:18
Completed
Created on: 12/21/2018, 6:19:00 PM
Status: Completed
Options: dsm: true
INDEXING: 3,000,000 points processed; 3,000,000 points written; 5.3 seconds passed
INDEXING: 4,000,000 points processed; 4,000,000 points written; 7.406 seconds passed
INDEXING: 31,000,000 points processed; 31,000,000 points written; 120.905 seconds passed
INDEXING: 32,000,000 points processed; 32,000,000 points written; 124.497 seconds passed
closing writer
Download Assets
View Map
View 3D Model
Restart
Delete
Edit
Share To OAM
前瞻水環境計畫苗栗卓蘭濕地公園監測
監測前瞻水環境計畫苗栗卓蘭濕地公園開發過程及後續影響
Select Images and GCP
View Map
1 Tasks
Edit
臺南市左鎮地區
Select Images and GCP
View Map
1 Tasks
Edit
嘉義千人洞(Thousand-People Cave, Chiayi County, Taiwan)
Mapping the 3D model of the Thousand-People Cave The aerial images were acquired on 2018-10-08 by a DJI Phantom 4 drone and an iPad tablet with Pix4Dcapture app. One free flight mission with 3-meter interval and tilt camera was used to take the aerial images.
Select Images and GCP
View Map

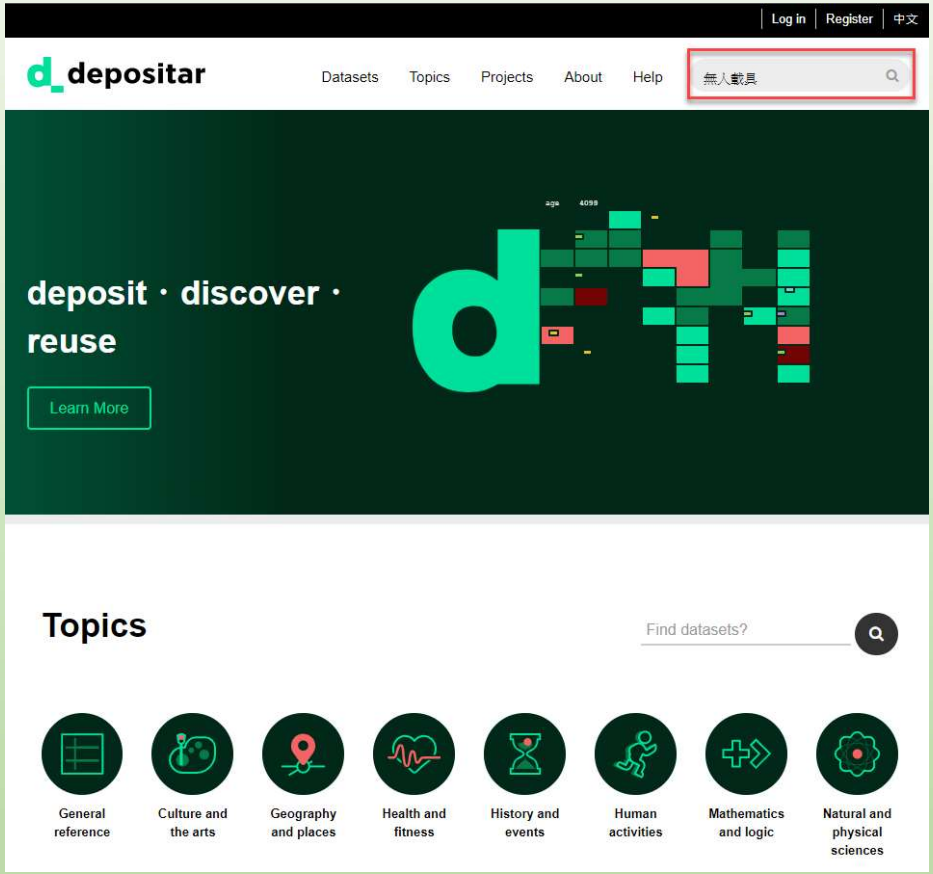
瀏覽2D影像與共享資料

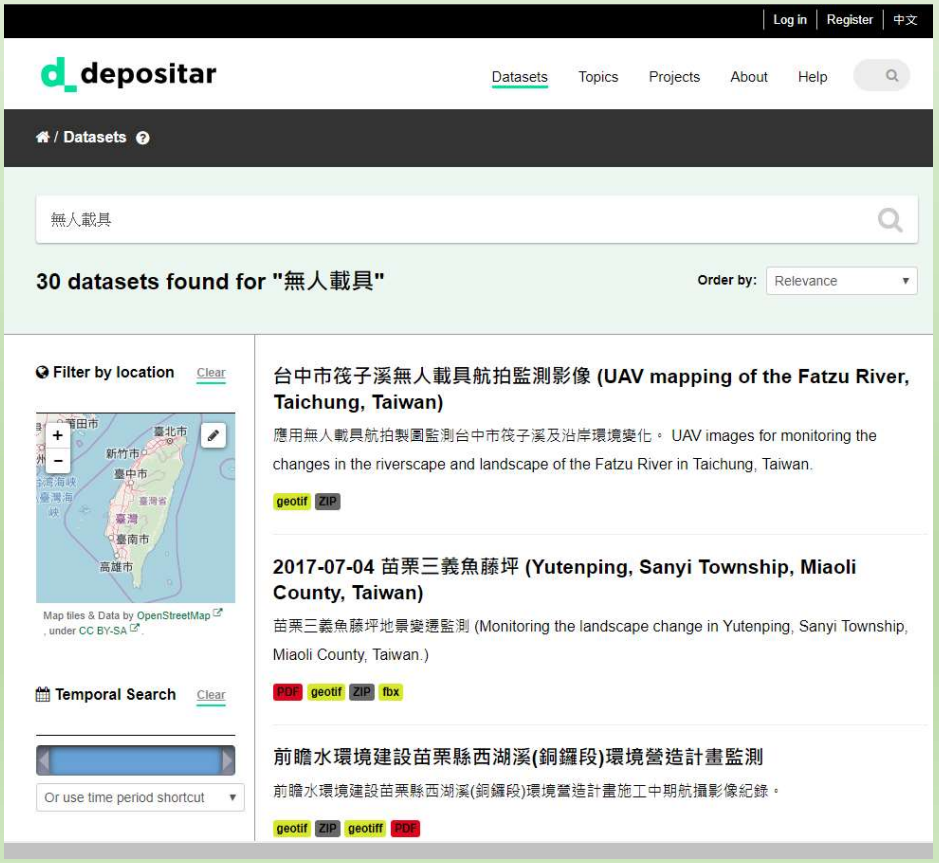


瀏覽3D模型

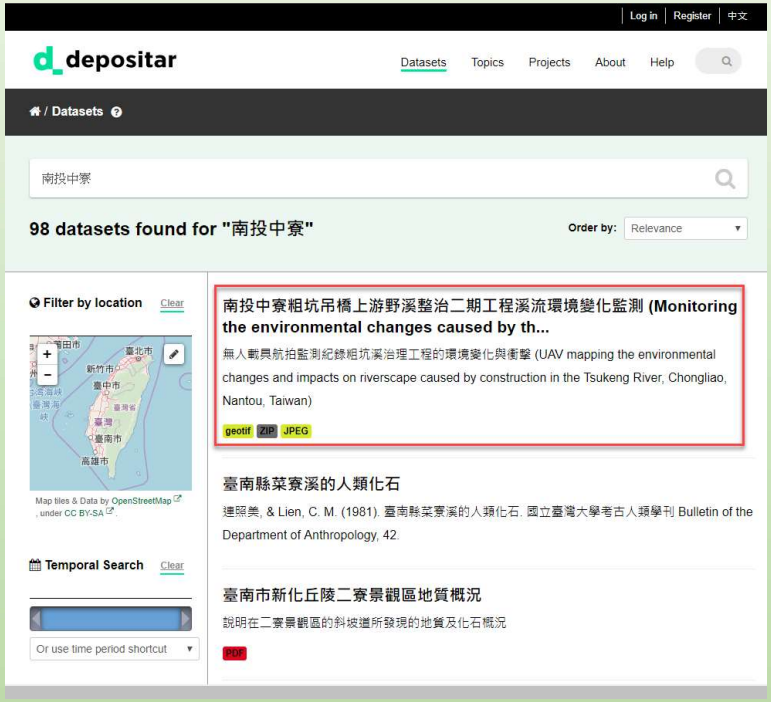

WebODM for the Asian UAS Observation Network
Dashboard
OpenAerialMap
GCP Interface
Diagnostic
Lightning Network
Cesium ion
Processing Nodes
Administration
2017-05-25 南投中寮粗坑溪 (2017-05-25, Tsu-Keng River, Chong-Liao, Nantou, Taiwan)
Textured Model
Appearance
Tools
Measurement
Clipping
Clip Task
None
Highlight
Inside
Outside
Clip Method
Inside Any
Inside All
Navigation
Camera Projection
Perspective
Orthographic
Speed: 448.4
Scene
Filters
About
Share
2D

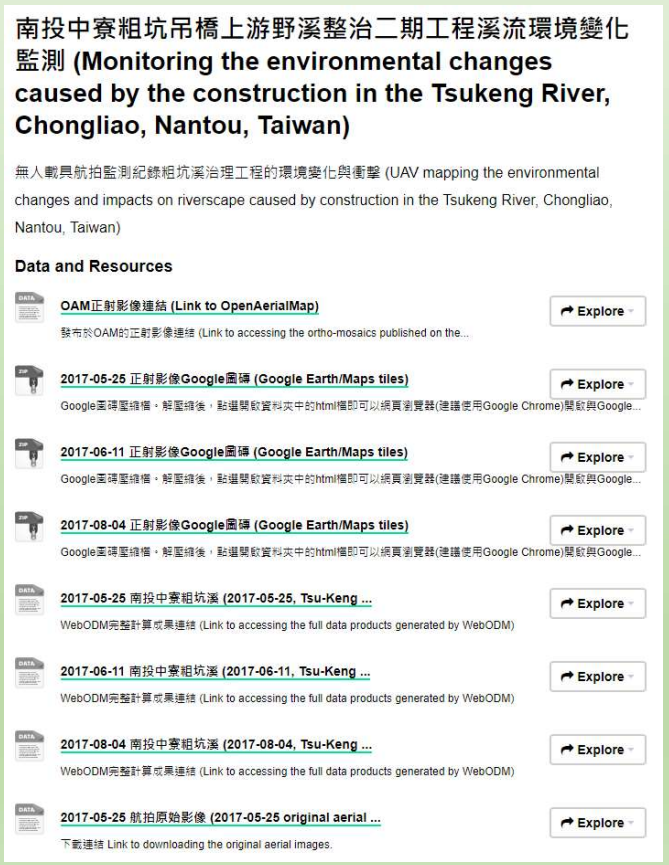
“無人載具” 查詢研究資料寄存所

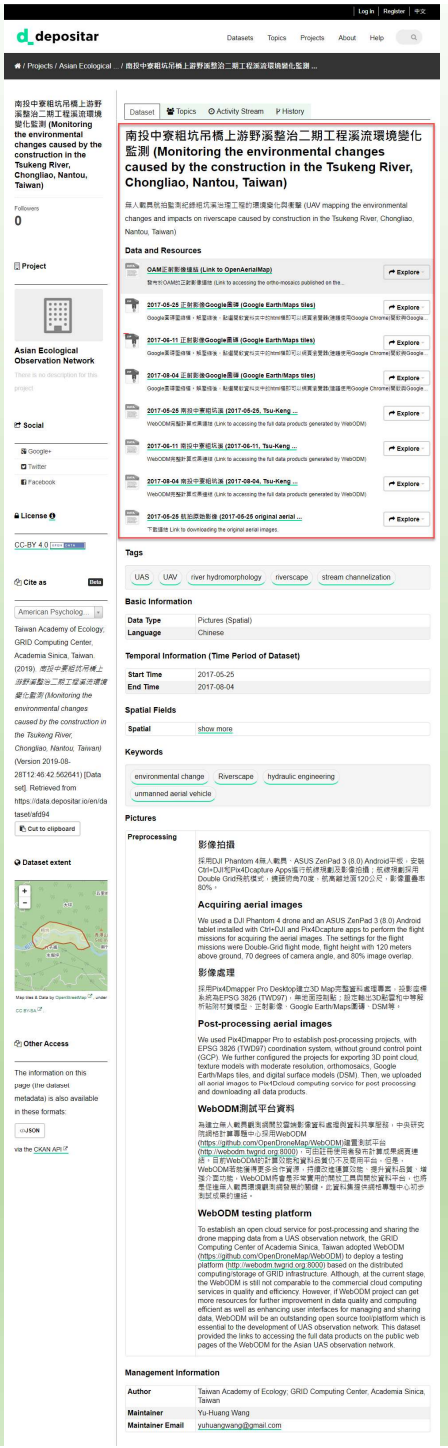




以“南投中寮”查詢研究資料寄存所



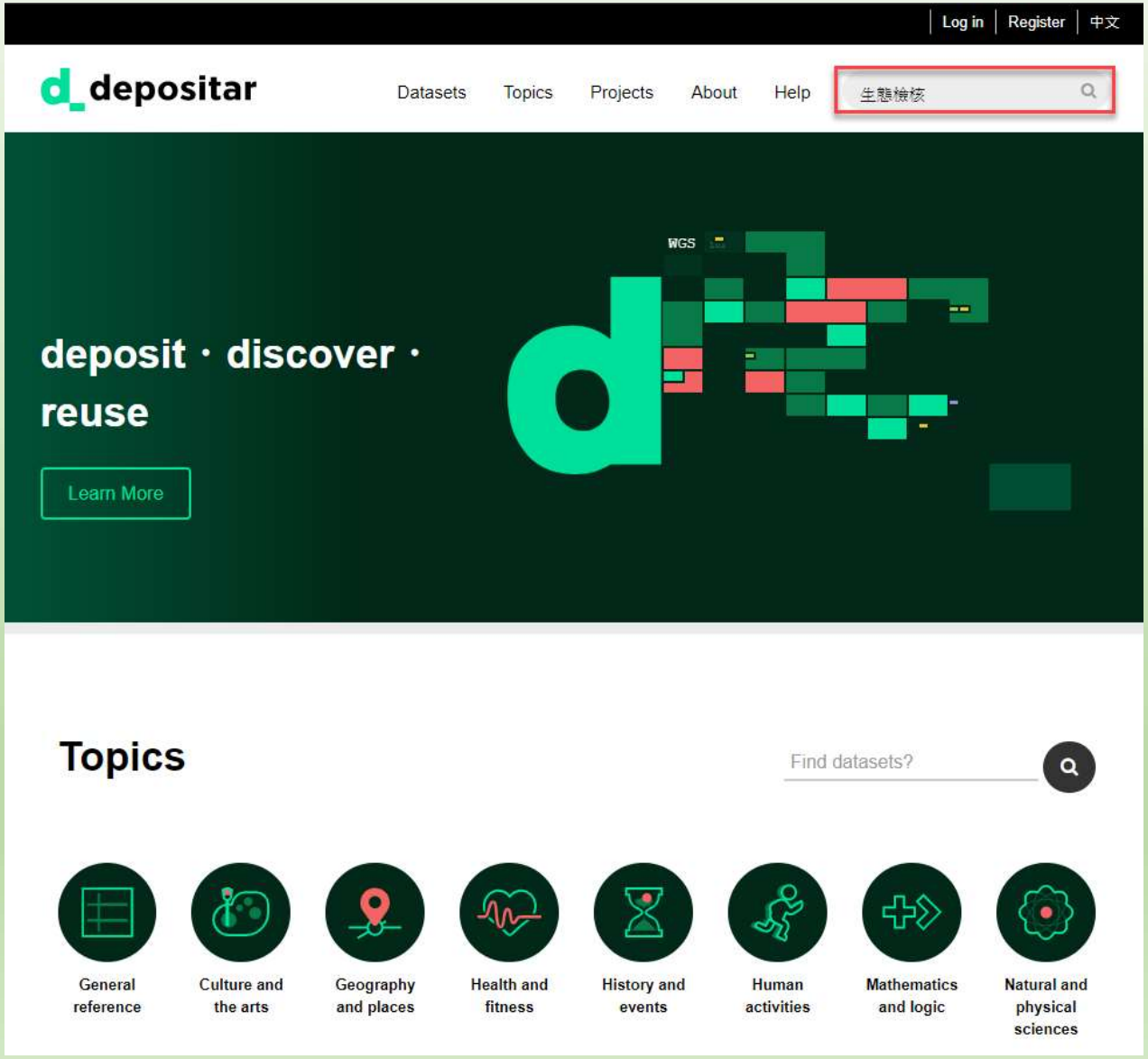




前瞻水環境建設公共工程破壞生態環境的爭議

- 公民參與
- 生態檢核資訊公開、資料開放
- 苗栗卓蘭大安溪濕地公園破壞石虎重要棲地

關鍵字搜尋生態檢核資料集



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depositar

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/ Datasets

生態檢核

98 datasets found for "生態檢核"

Order by: Last Modified

Filter by location Clear

Map tiles & Data by OpenStreetMap , under CC BY-SA .

Temporal Search Clear

Or use time period shortcut

2018台中市霧峰區車籠埔排水治理工程設計階段生態檢核

此資料集是由台中市政府水利局委託台灣石虎保育協會，於2018-05-01至2018-10-31期間進行台中市霧峰區車籠埔排水1K+700 - 5K+300治理工程設計階段生態檢核所產生的資料，包含無人載具航拍影像、治理工程範圍、細部設計平面配置圖、生態調查、關注區域、細部設計平面配置圖等基礎資料及成果報告。

KML KMZ ZIP geotif PDF DOCX

2018台中市豐原區北坑溪治理工程設計階段生態檢核

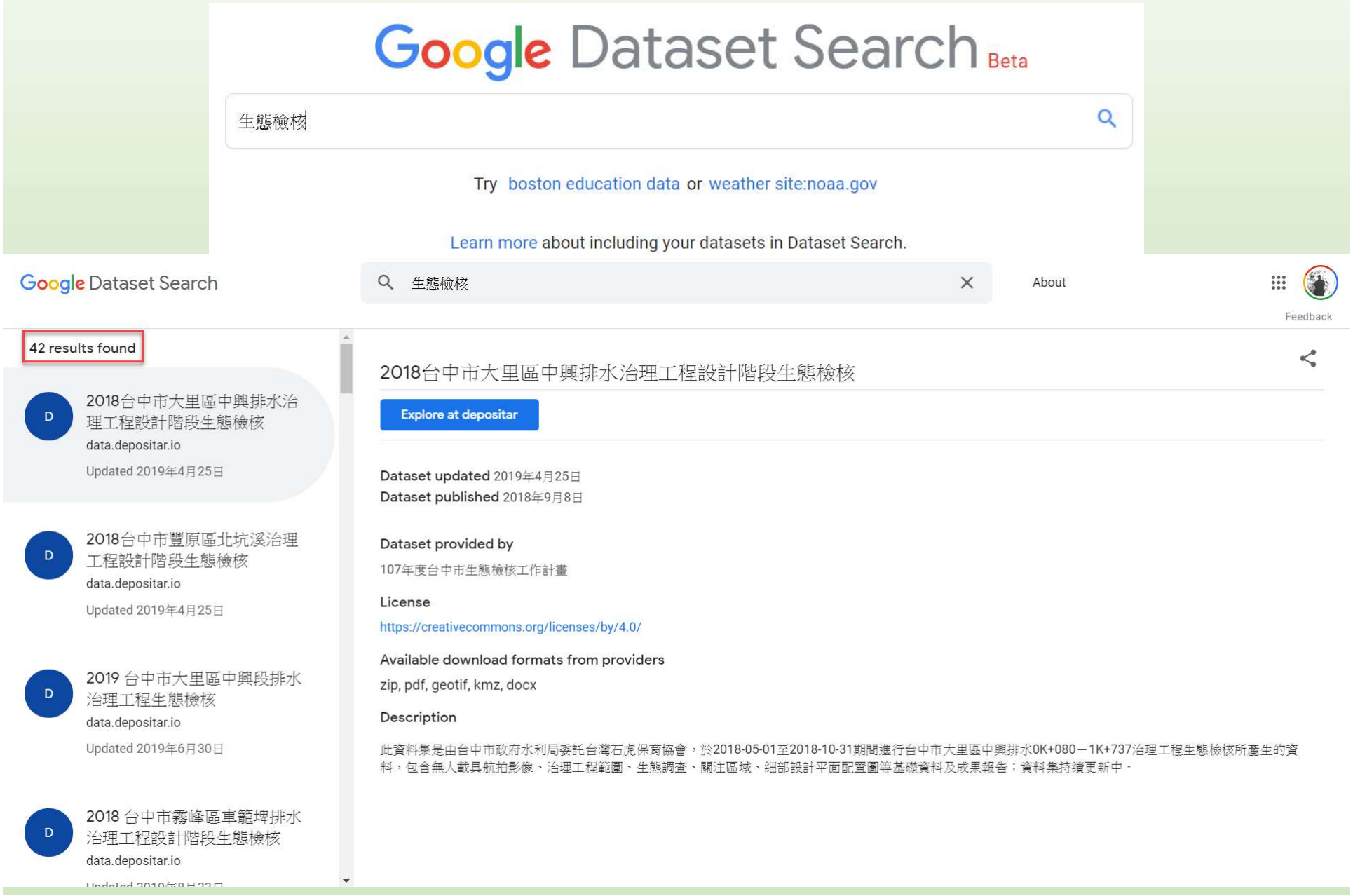
此資料集是由台中市政府水利局委託台灣石虎保育協會，於2018-05-01至2018-10-31期間進行台中市豐原區北坑溪0K+000 - 0K+741.4治理工程設計階段生態檢核所產生的資料，包含無人載具航拍影像、治理工程範圍、生態調查、關注區域、細部設計平面配置圖等基礎資料、成果報告。

KML KMZ ZIP geotif PDF DOCX

2018台中市大里區中興排水治理工程設計階段生態檢核

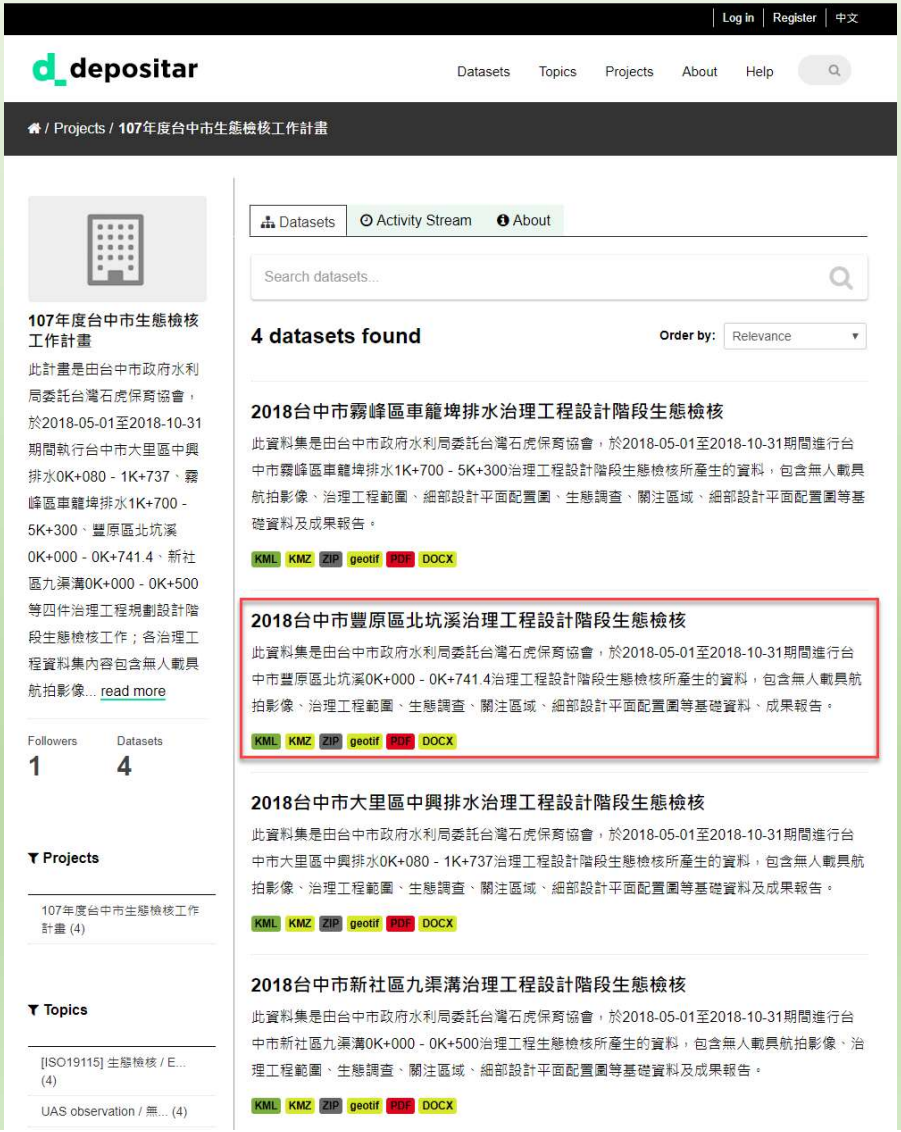
此資料集是由台中市政府水利局委託台灣石虎保育協會，於2018-05-01至2018-10-31期間進行台

Google Dataset Search



前瞻水環境建設公共工程
生態檢核開放資料

- 2018台中市區域排水治理工程生態檢核資料集為例



豐原北坑溪治理工程
設計階段生態檢核資料集

2018台中市豐原區北坑溪治理工程設計階段生態檢核

此資料集是由台中市政府水利局委託台灣石虎保育協會，於2018-05-01至2018-10-31期間進行台中市豐原區北坑溪0K+000 - 0K+741.4治理工程設計階段生態檢核所產生的資料，包含無人載具航拍影像、治理工程範圍、生態調查、關注區域、細部設計平面配置圖等基礎資料、成果報告。

Data and Resources

台中市豐原區北坑溪0K+000~0K+741.4治理工程範圍 — Explore

北坑溪0K+000~0K+741.4治理工程範圍KML檔

台中市豐原區北坑溪治理工程範圍圖層KMZ檔 — Explore

資料包含0K - 0K+741治理範圍、細部設計平面配置圖套疊等。 使用者可利用Google Earth...

正射影像Google圖磚 — Explore

Google圖磚壓縮檔。解壓縮後，點選開啟資料夾中的kml檔，即可使用Google...

正射影像 — Explore

2018-05-05拍攝，發布於OpenAerialMap的正射影像連結。

航攝影像資料品質報告 — Explore

Pix4Dmapper Pro影像處理資料品質報告。

植物名錄 — Explore

2018-06至2018-07期間，沿北坑溪治理工程範圍調查記錄的植物種類。

動物名錄 — Explore

2018-06至2018-07期間，沿北坑溪治理工程範圍調查記錄的動物種類。

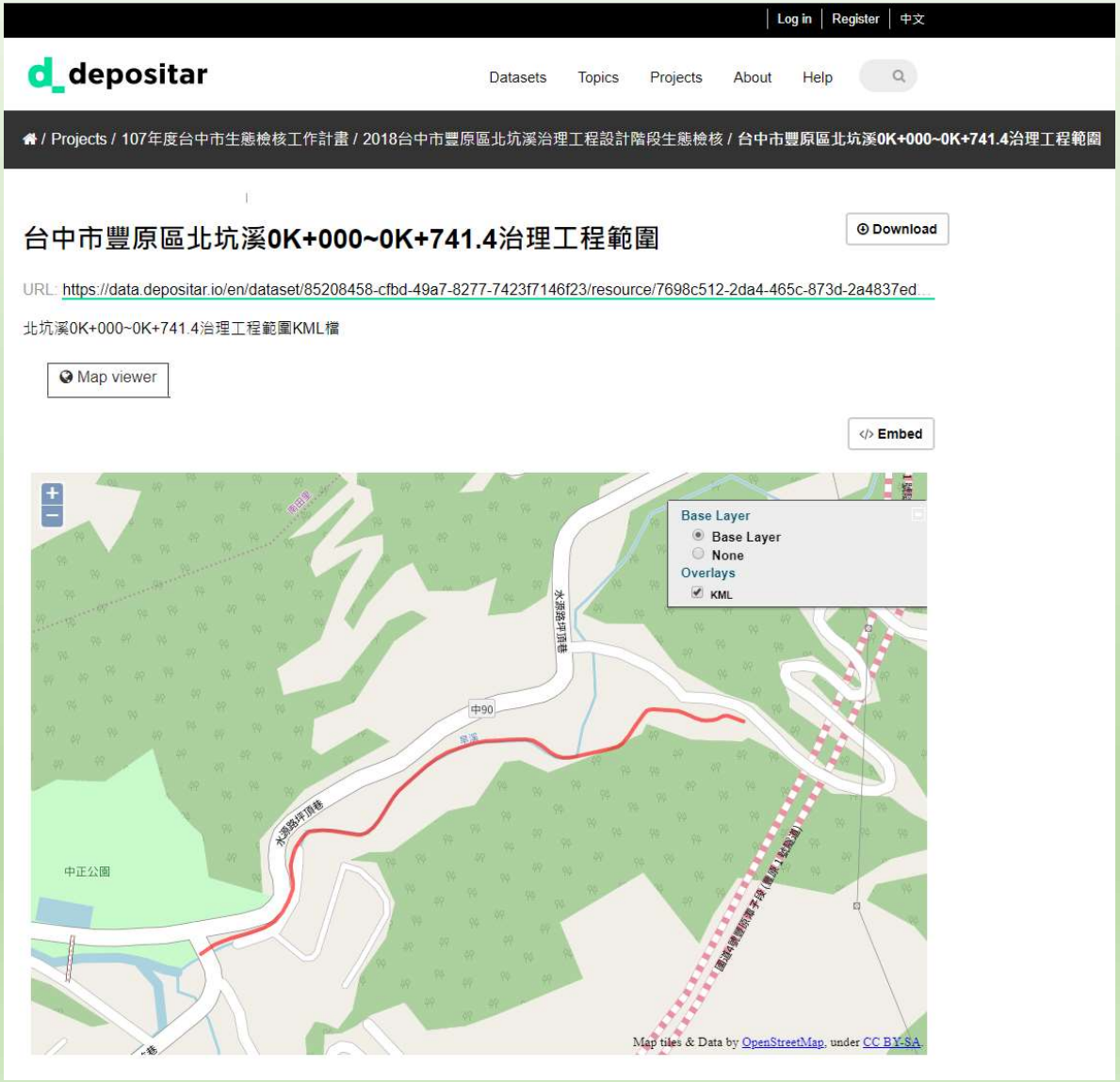
豐原北坑溪治理工程關注區域圖及保育措施自主檢查表 — Explore

關注區域圖讓施工廠商掌握施工範圍內的重要區域，施工過程必須注意，不可破壞。生態保育措施自主檢查表列出施工廠商必須遵守的作業規範，以確保各項保育措施能確實執行。

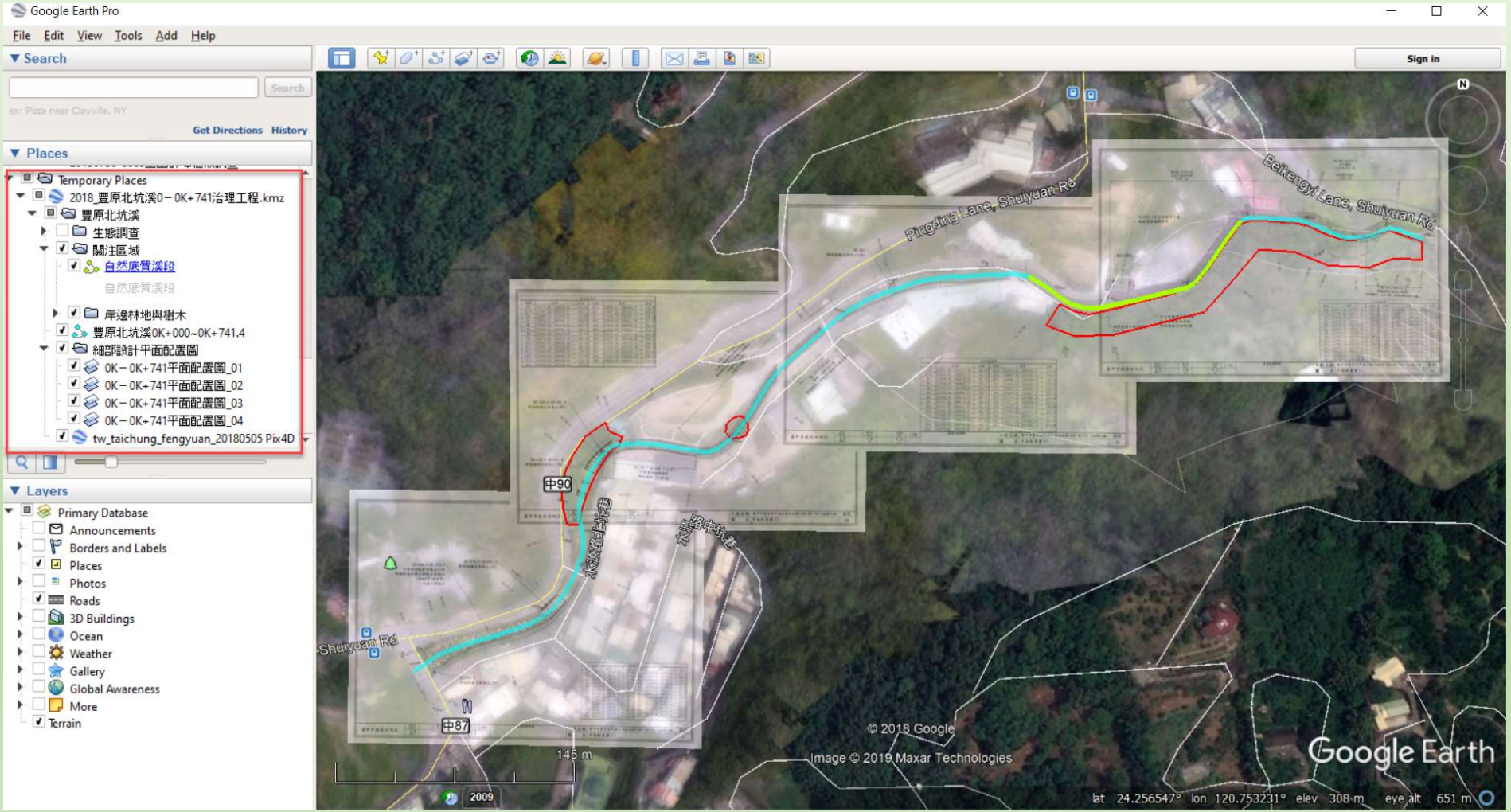
臺中市生態檢核工作計畫(107年度) 委託專業服務成果報告 — Explore

報告內容包含大里區中興排水0K+080 - 1K+737、霧峰區車籠埔排水1K+700 - 5K+300、豐原區北坑溪0K+000 - 0K+741.4、新社區九溝溝...

北坑溪治理工程範圍KML檔



Google Earth套疊北坑溪治理工程範圍、關注區域、平面配置圖、正射影像



資料管理開放協作平台

- 政府研究、專案、公民團體自主監測資料管理
- 公私協力管理與共享生態環境監測資料
- 長期支持開發與維運