



## 開放的研究資料儲存庫

# Towards An Open Repository for Research Data

2021 研究資料管理工作坊

Research Data Management Workshop 2021

2021-10-07

Cheng-Jen Lee 李承錱





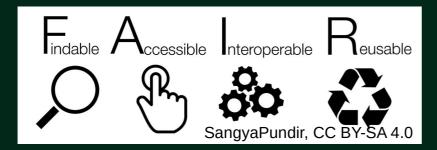




/depozi'tar/「寄存」之意

# 研究資料寄存所 (depositar)

- 儲存、尋找、分享
- 以開源資料平台 CKAN 為核心,輔以客製化套件
  - 部分修改亦回饋 CKAN 專案
- 通用型研究資料儲存庫
- 開放的寄存庫:開源軟體、自由註冊、開放內容
  - FAIR 資料原則的實踐
  - 盡可能都開放,視需要再保留 (as open as possible, as closed as necessary)





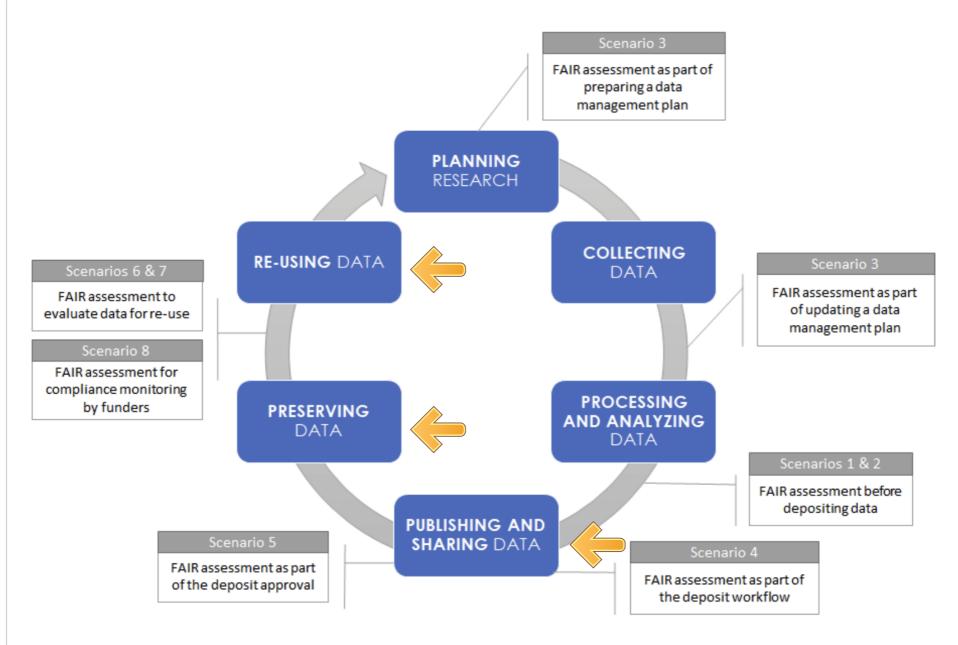


Figure 3. Research data lifecycle (figure adapted from (Mosconi et al., 2019) and scenarios of FAIR assessment of datasets therein.

3/23

## https://data.depositar.io/

d depositar

**1** What are Projects?

Projects are used to

create, manage and

publish collections of

datasets. Users can

have different roles

depending on their

level of authorisation to

within a Project,

create, edit and

publish.

Search projects...

高雄美濃雙溪橋上

下游疏濬工程溪流

(Monitoring the

environmental

changes caused

by the Dredging in the SHUANG XI

River, Meinong,

無人載具航拍監測紀

錄高雄美濃雙溪橋上

下游疏濬工程的環境

變化與衝擊 (UAV

mapping the

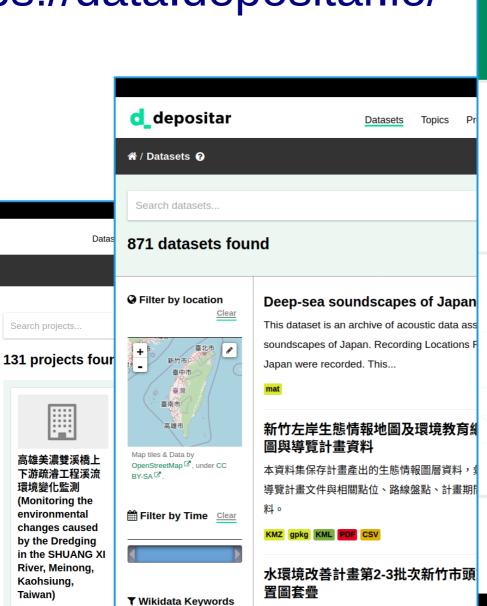
Taiiiang Inner Sea (51)

Kaohsiung,

Taiwan)

環境變化監測

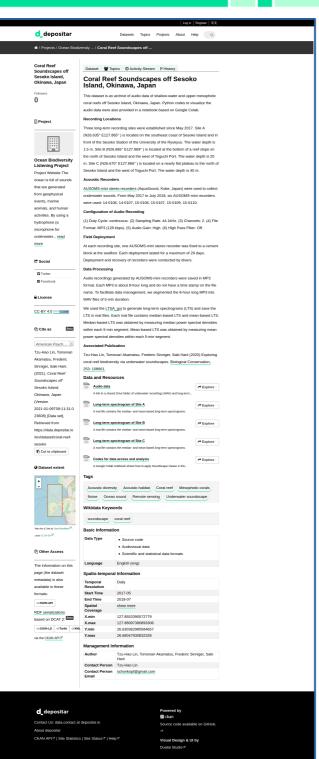
♠ / Projects



此資料集為新竹市環保局提供的水環境改善計劃

工程平面配置图,虚理成可使用Google Fath P





## 功能導覽:以資料集說明

https://data.depositar.io/en/dataset/coral-reef-sesoko

- 資料集與專案描述
- 資源 (實際檔案),可為外部連結
- 標籤與 Wikidata 關鍵字
- 基本資訊欄位
- 時空(間)資訊欄位
- 管理資訊欄位
- 授權
- 社群分享
- 引用工具
- 機器存取
  - JSON API
  - RDF Serializations

可作為搜尋條件

Metadata 詳細後設資料欄位說明:

https://docs.depositar.io /zh\_TW/stable/appendix /fields/index.html

## Coral Reef Soundscapes off Sesoko Island, Okinawa, Japan

Followers



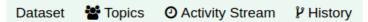
## Project



## Ocean Biodiversity Listening Project

Project Website The ocean is full of sounds that are generated from geophysical events, marine animals, and human activities. By using a hydrophone (a microphone for underwater... read

more



## Coral Reef Soundscapes off Sesoko Island, Okinawa, Japan



This dataset is an archive of audio data of shallow-water and upper-mesophotic coral reefs off Sesoko Island, Okinawa, Japan. Python codes to visualize the audio data were also provided in a notebook based on Google Colab.

#### **Recording Locations**

Three long-term recording sites were established since May 2017. Site A (N26.635° E127.865°) is located on the southeast coast of Sesoko Island and in front of the Sesoko Station of the University of the Ryukyus. The water depth is 1.5 m. Site B (N26.665° E127.869°) is located at the bottom of a reef slope on the north of Sesoko Island and the west of Toguchi Port. The water depth is 20 m. Site C (N26.670° E127.866°) is located on a nearly flat plateau to the north of Sesoko Island and the west of Toguchi Port. The water depth is 40 m.

#### **Acoustic Recorders**

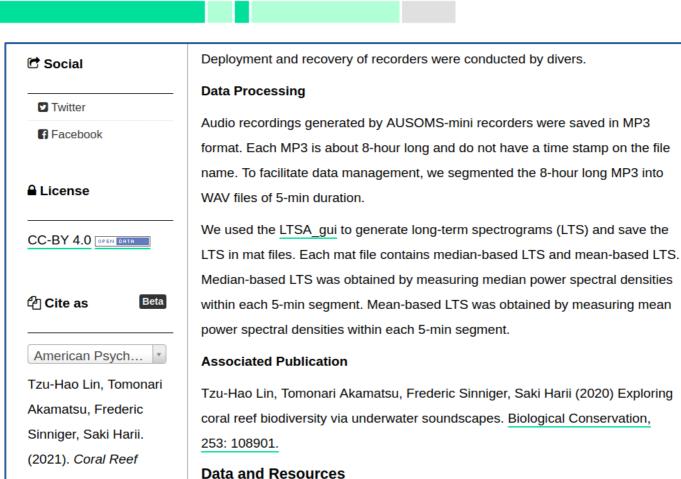
AUSOMS-mini stereo recorders (AquaSound, Kobe, Japan) were used to collect underwater sounds. From May 2017 to July 2018, six AUSOMS-mini recorders were used: 14-0106, 14-0107, 15-0106, 15-0107, 15-0109, 15-0110.

### **Configuration of Audio Recording**

(1) Duty Cycle: continuous. (2) Sampling Rate: 44.1kHz. (3) Channels: 2. (4) File Format: MP3 (128 kbps). (5) Audio Gain: High. (6) High Pass Filter: Off.

### **Field Deployment**

At each recording site, one AUSOMS-mini stereo recorder was fixed to a cement



**Associated Publication** Tzu-Hao Lin, Tomonari Akamatsu, Frederic Sinniger, Saki Harii (2020) Exploring coral reef biodiversity via underwater soundscapes. Biological Conservation, **Data and Resources** Soundscapes off Audio data Explore Sesoko Island, A link to a shared Drive folder of underwater recordings (WAV) and long-term... Okinawa, Japan (Version Long-term spectrogram of Site A **Explore** 2021-01-09T09:11:31.0 A mat file contains the median- and mean-based long-term spectrograms. 23608) [Data set]. Long-term spectrogram of Site B Retrieved from **Explore** https://data.depositar.io A mat file contains the median- and mean-based long-term spectrograms. /en/dataset/coral-reef-Long-term spectrogram of Site C Explore sesoko A mat file contains the median- and mean-based long-term spectrograms. Cut to clipboard







Map tiles & Data by  ${\sf OpenStreetMap}^{\, {\hbox{$ \Bar{\it C}$}}^n}, \, {\sf under} \, {\sf CC} \, {\sf BY-SA}^{\, {\hbox{$ \Bar{\it C}$}}^n}.$ 

#### 1 Other Access



The information on this page (the dataset metadata) is also available in these formats:

</>JSON-API

RDF serializations based on DCAT 2:



</>

<p

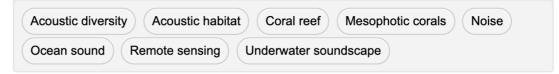
via the CKAN API



### Codes for data access and analysis

A Google Colab notebook shows how to apply Soundscape Viewer in the...

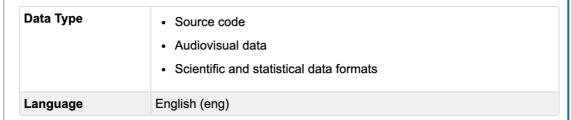
### Tags



## Wikidata Keywords

soundscape coral reef

#### **Basic Information**



### **Spatio-temporal Information**

Temporal Resolution	Daily
Start Time	2017-05
End Time	2018-07
Spatial Coverage	show more
X.min	127.8553390572779
X.max	127.88097380893306
Y.min	26.630362980584657
Y.max	26.68047930832328

## **Management Information**

Author	Tzu-Hao Lin, Tomonari Akamatsu, Frederic Sinniger, Saki Harii
<b>Contact Person</b>	Tzu-Hao Lin





Explore -









## Dataset extent



Map tiles & Data by OpenStreetMap <sup>☑</sup>, under CC BY-SA ☑.

## 🖒 其他存取方式



此頁面上的資訊 (資料集之 後設資料) 也提供以下格 式:

</>JSON-API

RDF 串列化輸出 (修改自 DCAT 2):



經由 CKAN API 🗗

## 標籤

Mesophotic corals Acoustic diversity Acoustic habitat Coral reef Noise Underwater soundscape Ocean sound Remote sensing

## Wikidata 關鍵字

珊瑚礁 聲景

## 基本資訊

資料類型	<ul><li>原始碼</li><li>影音資料</li><li>科學與統計資料</li></ul>
語言	英文 (eng)

### 時空資訊

時間解析度	日
起始時間	2017-05
結束時間	2018-07
空間範圍	顯示更多
空間範圍.X.min	127.8553390572779
空間範圍.X.max	127.88097380893306
空間範圍.Y.min	26.630362980584657
空間範圍.Y.max	26.68047930832328

## 管理資訊

產製者	Tzu-Hao Lin, Tomonari Akamatsu, Frederic Sinniger, Saki Harii
聯絡人	Tzu-Hao Lin

















Biological Conservation 253 (2021) 10890



Contents lists available at ScienceDirect

#### **Biological Conservation**

journal homepage: www.elsevier.com/locate/biocon



## Check for undates

#### Exploring coral reef biodiversity via underwater soundscapes

Tzu-Hao Lin a,\*, Tomonari Akamatsu b,\*\*, Frederic Sinniger , Saki Harii

- " Biodiversity Research Center, Academia Sinica, Taiwan
- b The Ocean Policy Research Institute, The Sasakawa Peace Foundation, Japan
- <sup>c</sup> Tropical Biosphere Research Center, University of Ryukyus, Japan

#### ARTICLE INFO

Keywords:
Ocean sound
Mesophotic corals
Remote sensing
Noise
Acoustic habitat
Acoustic diversity

#### ABSTRACT

Information on biodiversity is essential to evaluate the ecological status of coral reefs. Sounds produced by reefassociated organisms have been used as a biodiversity indicator. However, the interference from abiotic sounds and the lack of a comprehensive audio library have impeded effective evaluation. This study investigated the application of underwater soundscapes as a remote-sensing method to detect biological and anthropogenic activities. Using techniques including the visualization of long-duration recordings, source separation, and clustering, soundscapes were separated into sounds of anthropogenic and biological sources. Our results revealed the dynamics of biological sounds among coral reefs off Sesoko Island, Okinawa, Japan, Biological sounds were much more prominent in shallow-water reefs than in upper-mesophotic reefs, but their spectral features and compositions differed. The shallow-water reefs were dominated by broadband sounds of crustaceans and low-frequency transient fish calls, whereas the upper-mesophotic reefs were characterized by a diverse array of fish choruses and transient sounds. We also discovered that shipping noise beavily interfered with the soundscapes from the upper-mesophotic reefs and represented an invisible threat to life in the low-light habitat. The applied techniques of soundscape information retrieval revealed the distinct ecological status of coral reefs and the behavior change of sound-producing organisms in high temporal resolution. Implementation of soundscape monitoring can generate ecological information on habitat quality, reef biodiversity, human activities, and their interactions. Global collaboration on underwater soundscapes will establish a data-informed platform and help stakeholders assess the resilience of coral reefs to environmental and anthropogenic stressors.

#### 1. Introduction

Marine ecosystems provide irreplaceable services and currently face significant pressures due to climate change, human disturbance, and excessive use of marine resources. The United Nations has recognized these threats and placed the conservation of marine ecosystems as one of its sustainable development goals (UN General Assembly, 2015). Coral reefs support various social and economic activities, such as fisheries, coastal protection, and tourism, of many maritime tropical and subtropical nations (Moberg and Folke, 1999; Barbier, 2017; Spalding et al., 2017; Woodhead et al., 2019). These benefits rely on the abundant biodiversity in coral reefs. However, coral reefs have undergone recurrent high-frequency bleaching episodes over the past 20 years due to increased sea surface temperatures (Hughes et al., 2017, 2018). Therefore, detailed information on the spatiotemporal changing patterns of marine biodiversity and interactions with human activities is crucial for

the conservation management of coral reefs.

Biodiversity monitoring in coral reefs remains challenging, partially due to the distinct reef environments and their unique fish assemblages (Pearman et al., 2018; Dumalagan et al., 2019). A comprehensive and long-term assessment of reef biodiversity, environmental characterisms, and human activities may not be feasible because of limited resources for observation and survey opportunities, especially for developing regions or remote reefs. An underwater sensing system capable of monitoring the changing patterns of marine biodiversity, with the ability to diagnose potential risks due to environmental and anthropogenic stressors, is required for establishing management strategies of coral reefs and for providing alerts to the early-warning signs of ecosystem changes (Schmeller et al., 2017; Obura et al., 2019).

A potential solution for such an underwater sensing platform is through monitoring ocean sounds. One autonomous recorder can store long-duration audio recordings, with improved time resolution of

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s. However, the n shallow-water ound-producing Although basic

in mesophotic

ound-producing
Although basic
remains scant,
ill improve our
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surement of the n shallow-water horus may be which has been any be partly the coral reef in et al., 1999; water recording winter. These easily quanting the may influence the number of the number of

systems and ca er soundscapes larvae, listen to d settlement to (Vermeij et al the recruitmen hances the rec erfere with the d the acousti he resilience o Mooney, 2015

> to shipping ac uency sounds i ries only briefl photic reefs of of a bay and ar propagation c ctivities signifi esophotic reefs r the available soniferous aniocean temperteriorate due to on. Therefore, it silience of coral nagement plans ed here and the vstem functions

t from the longployment of an rk methods, and als. This study ous acoustic reref soundscapes. With the recent development of underwater technology and audio information retrieval techniques, a soundscape monitoring network can

Biological Conservation 253 (2021) 108901

generate numerous acoustic data that contain ecological information in multiple dimensions, including the quality of the acoustic habitat, community of sound-producing organisms, and potential effects due to human activities. The generated information will allow managers and stakeholders to conduct a more comprehensive assessment of ecosystem

## Data availability

The audio dataset used in preparing this paper are available from the corresponding authors on reasonable request. A dataset of the LTS is available on depositar (https://data.depositar.io/en/dataset/coral-reef-sesoko

integration of noise management into spatiotemporal planning and risk assessment of ecosystem-level consequences.

#### Data availability

The audio dataset used in preparing this paper are available from the corresponding authors on reasonable request. A dataset of the LTS is available on depositar (https://data.depositar.io/en/dataset/coral-ree [ss-sakn)

#### CRediT authorship contribution statement

Tzu-Hao Lin: Conceptualization, Methodology, Software, Validation, Data curation, Formal analysis, Resources, Writing—original draft. Tomonari Akamatsu: Conceptualization, Methodology, Resources, Data curation, Writing—reviewing and editing, Funding acquisition. Frederic Sinniger. Conceptualization, Visualization, Investigation, Data curation, Writing—reviewing and editing. Saki Harii: Conceptualization, Investigation, Writing—reviewing and editing, Funding



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<sup>\*</sup> Correspondence to: T.-H. Lin, Biodiversity Research Center, Academia Sinica, 128 Academia Road, Sec. 2, Nankang, Taipei 11529, Taiwan.

<sup>\*\*</sup> Correspondence to: T. Akamatsu, The Ocean Policy Research Institute, The Sasakawa Peace Foundation, 1-15-16 Toranomon, Minato, Tokyo 105-8524, Japan.

E-mail addresses lintzuhao@eate.sinica.edu.tw (T.-H. Lin). akamatsu.tom@email.com (T. Akamatsu).

# 機器存取 (1) : JSON Data API

☆ / Projects / 台江內海地區跨領域研究群 / Taijiang ... / Place Names in West ... / Place Name

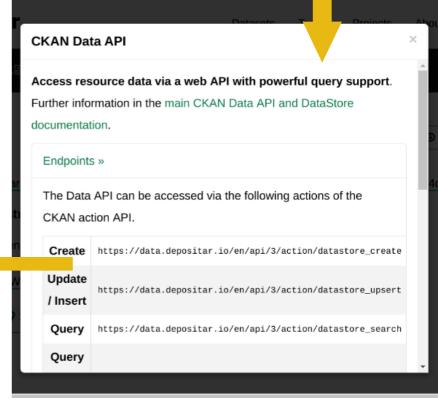
## **Place Name**

URL: https://data.depositar.io/dataset/663e06ce-904b-44e6-94fe-370a103f9587/resource/2bbe675c-67eb-4c91-8aef-e675fd160

#### From the dataset abstract

Place Names on Ancient Maps of West Central District of Tainan.





Opening the second s

□ Data API

## 資源描述框架

## 串列化輸出

# 機器存取 (2) – RDF Serializations

### Wikidata 關鍵字

聲景

珊瑚礁

### 基本資訊



資料類型	• 原始碼
	• 影音資料
	• 科學與統計資料
語言	英文 (eng)

### 時空資訊



時間解析度	日
起始時間	2017-05
結束時間	2018-07
空間範圍	顯示更多
空間範圍.X.min	127.8553390572779
空間範圍.X.max	127.88097380893306
空間範圍.Y.min	26.630362980584657
空間範圍.Y.max	26.68047930832328

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 "dc:creator": "Tzu-Hao Lin, Tomonari Akamatsu, Frederic Sinniger, Saki Harii",
"dcat:contactPoint": { ... }, // 1 item
 "dcat:distribution": [ ... ], // 5 items
 "dcat:keyword": [ ... ], // 8 items
 "dcat:temporalResolution": { ... }, // 2 items
 "dcat:theme": [
        "@id": "wd:011292"
                                以 JSON-LD 格式為例
    },
        "@id": "wd:Q1358257"
                                呈現 Linked Data
 ],
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 },
"dct:publisher": { ... }, // 1 item
"dct:spatial": { ... }, // 1 item
 "dct:title": "Coral Reef Soundscapes off Sesoko Island, Okinawa, Japan",
"dct:type": [
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    },
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 ],
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     "@value": "2017-05-01T00:00:00"
```

## 多元類型資料彙整

https://data.depositar.io/dataset/6ac93





#### **d**\_depositar

聯絡我們: data.contact at depositar.io 關於研究資料寄存所 (depositar) CKAN API 『 網站統計 | 網站統計 | 垣場 使用條款 | 籐私政策 ☑ ckan 程式碼可於 GitHub로 取得。 Visual Design & UI by

# 航拍規劃中心線 (KML 檔案)

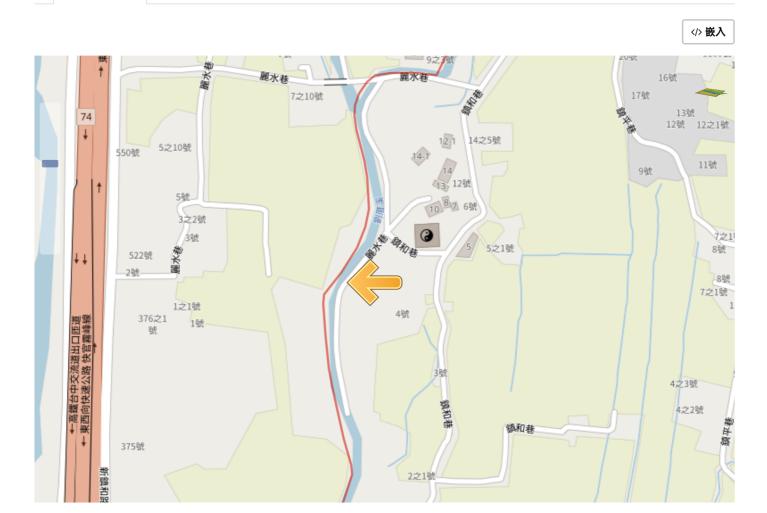
## 航拍規劃中心線

④ 下載

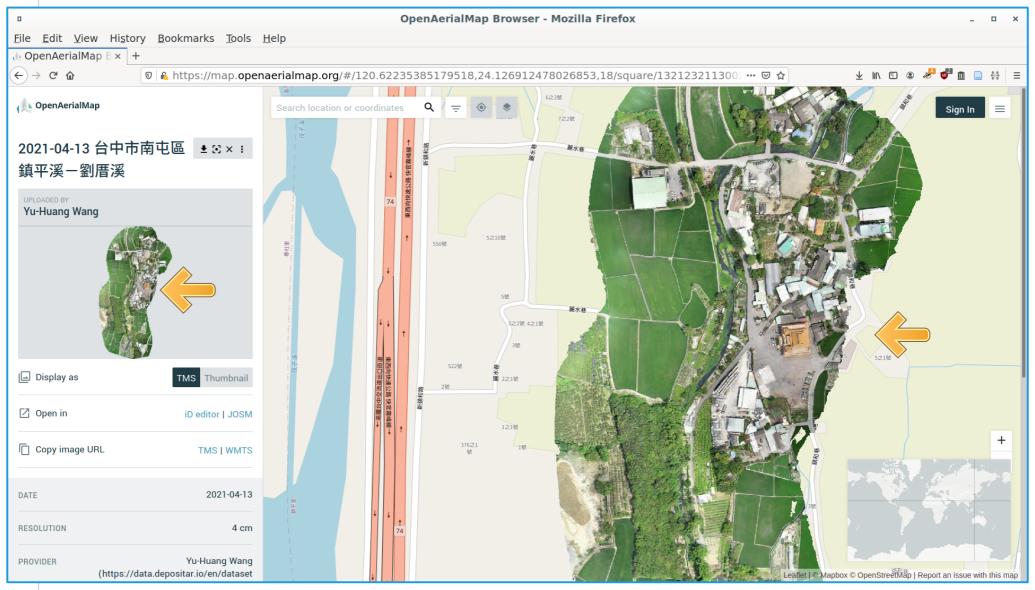
網址: https://data.depositar.io/dataset/3f539acc-9108-4ce7-83f9-b01c9670e3cb/resource/5fd0db72-e2aa-4b6a-8e3f-122136e025...

規劃航線中心線KML檔

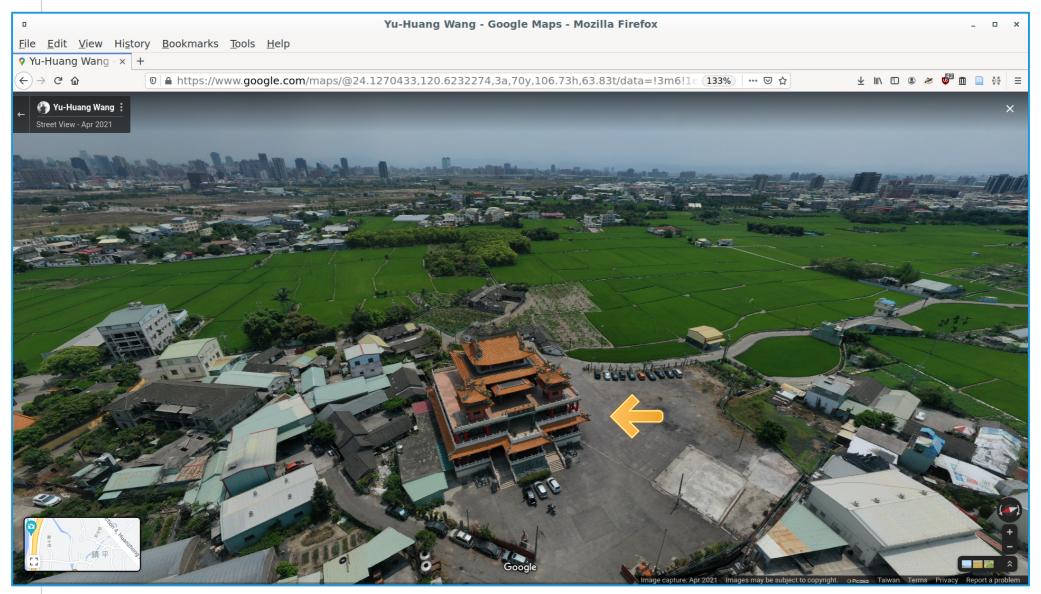
Map viewer



# 正射影像 (連結至 Open Aerial Map)



## 空中 360° 影像 (連結至 Google Street View)

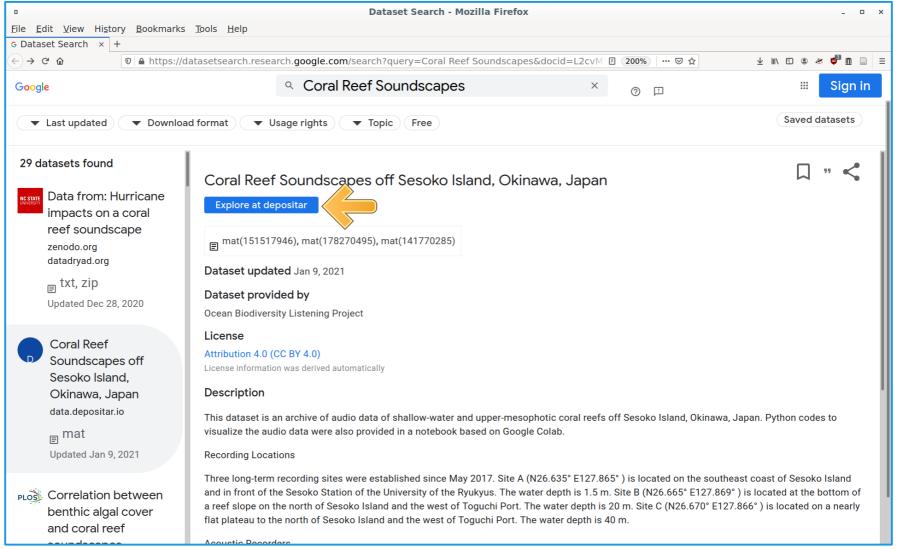


# depositar 近期更新

- Google Dataset Search 包含 depositar 資料集搜尋結果
- 資料集引用工具
- 與使用者社群接觸
  - 研究者、公民團體、政府單位等
- 使用條款、隱私政策
- 研究資料管理概念推廣
  - 研究資料管理工作坊 (2018 與 2021 年) 與研究資料推進室網站
  - 科技部三年期計畫支持 (2019 至 2022 年)
- @\_depositar 歡迎在 Twitter 上追蹤我們

## depositar @ Google Dataset Search

https://datasetsearch.research.google.com/search?query=Coral Reef Soundscapes



# **FAIRness of Research Data** on *depositar*

Assessed by F-UJI



F-UJI is based on a web service to programatically assess FAIRness of research data objects based on the FAIRsFAIR Data Object Assessment Metrics.

The tool allows to assess the FAIRness of research data at the dataset level. Typically, this is downloadable data that is linked to metadata and published over the Internet.

F-UJI was not designed to assess the FAIRness of data containers, collections or catalogues, data repositories or research projects.

F-UJI was developed by Anusuriya Devaraju & Robert Huber (PANGAEA) under the umbrella of the FAIRsFAIR project.

Click here to assess a dataset

**Privacy Policy** 

Terms of Use

Legal Notice

F-UJI is a result of the FAIRSFAIR "Fostering FAIR Data Practices In Europe" project which received funding from the European Union's Horizon 2020 project call H2020-INFRAEOSC-2018-2020 (grant agreement 831558).

南投中寮粗坑吊橋上游野溪整治二期工程溪流環境變化監測 (Monitoring the environmental changes caused by the river engineering in the Tsukeng River, Chongliao, Nantou, Taiwan) - depositar

	✓ Save JSON
FAIR level: ②	moderate
Resource PID/URL:	https://data.depositar.io/dataset/afd94
DataCite support:	enabled
Metric Version:	metrics_v0.4
Metric Specification:	https://doi.org/10.5281/zenodo.4081213
Software version:	v1.3.8
Download assessment results:	{JSON}
Save and share assessment results:	
Showing cached or saved response. Click here	to rerun the assessment

## Summary:

		Score earn	ed:	Fair level:	
Reusable R1.3 F1 Findable F2	Findable:	2.5 of 7	0	initial	
A7 F4	Accessible:	2 of 3	0	moderate	
13 % A1	Interoperable:	2 of 4	0	moderate	
Interoperable 11 Accessible	Reusable:	5 of 10	0	moderate	20

## Report:

## **Findable**

FsF-F1-01D - Data is assigned a globally unique identifier.



**\** 

FsF-F1-02D - Data is assigned a persistent identifier.



**/** 

FsF-F2-01M - Metadata includes descriptive core elements (creator, title, data identifier, publisher, publication date, summary and keywords) to support data findability.



**\** 

FsF-F3-01M - Metadata includes the identifier of the data it describes.



**\** 

FsF-F4-01M - Metadata is offered in such a way that it can be retrieved programmatically.



 $\vee$ 

# depositar 進行中工作

22/23

- Persistent Identifier (PID) 資源典藏碼
   持續識別碼: Archival Resource Keys (ARKs)
  - 由加州數位圖書館發起, 社群維護的 PID 系統
- 新首頁設計:著重「快速取用」與「功能引導」
- CoreTrustSeal 認證
- 影音上傳(附加平台)
- 持續探索研究資料管理概念
- 增進與已導入研究資料管理方案團隊之連結







https://data.depositar.io/

https://docs.depositar.io/ https://github.com/depositar/

data.contact@depositar.io

The *depositar* is a collaboration at the Institute of Information Science, the Research Center for Information Technology Innovation, and the Research Center for Humanities and Social Sciences (GIS Center) in Academia Sinica, Taiwan. The project has been supported, in part, by grants from Taiwan's Ministry of Science and Technology.

「研究資料寄存所」是中央研究院資訊科學研究所、資訊科技創新研究中心、人文社會科學研究中心 (地理資訊科學研究專題中心)的協作專案,部份經費來自台灣科技部的專題研究計畫。

