

# Collaboration in Soundscape Monitoring: A Use Case for Research Data Management

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*depositor* is a collaboration at IIS, CITI, and GIS Center (RCHSS) in Academia Sinica, supported in part by MOST grants, Taiwan  
「研究資料寄存所」是中央研究院資訊所、資創中心、GIS 中心  
(人社中心) 的協作專案，部份經費來自台灣科技部計畫



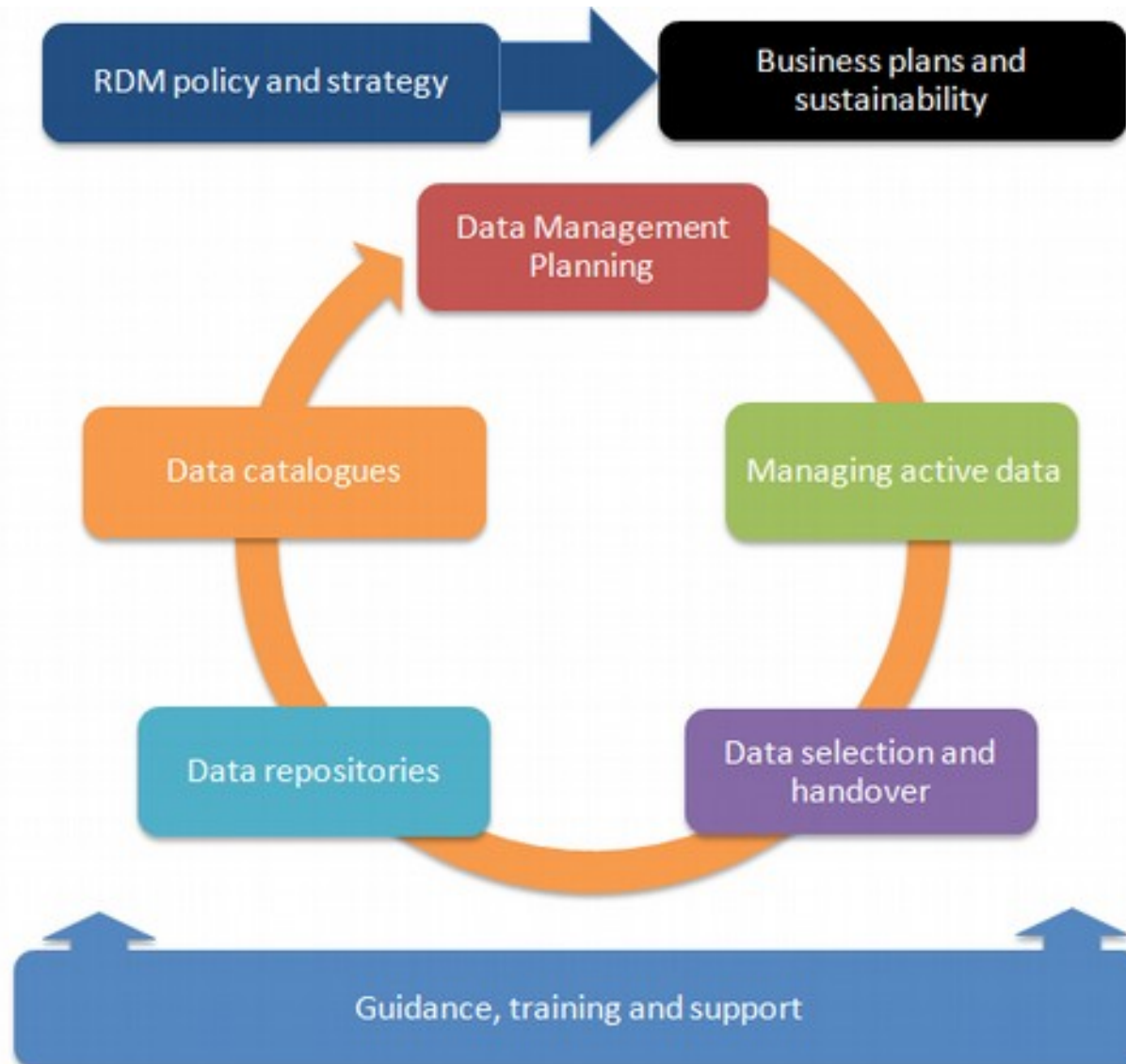


# Outline

- CKAN
- ***depositar*** – on the shoulder of CKAN
- Features and show cases
- Collaboration in soundscape monitoring
- Infrastructure from below

# Research Data Management (RDM)

<http://www.dcc.ac.uk/resources/how-guides/how-develop-rdm-services>





# CKAN

- **C**omprehensive **K**nowledge **A**rchive **N**etwork
- Software for powering hubs of open datasets
- Developed by the Open Knowledge International; supported by an active contributor community
- Widely used to manage open government data portals, e.g. [catalog.data.gov](https://catalog.data.gov)
- Written in Python, released under AGPL 3.0
- The CKAN API exposes all core features to clients



# *depositar* – on the shoulder of CKAN

- *depositar* – v. to deposit  
*depositario* – n. trustee, depository
- [data.depositar.io](https://data.depositar.io) – built on top of CKAN
- New in *depositar*
  - **open to academic user registration**
  - support spatiotemporal description and query
  - more data preview and base map
  - keywords sourced from [Wikidata](#)
  - simplified metadata authoring

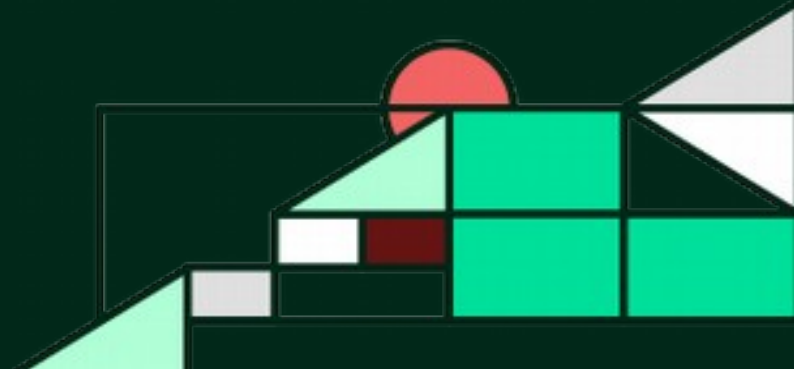


# Publisher vs. Depository

- CKAN – software for publishing open data
- *depositar* – a depository for research data
- publisher – engage in “acquisition, copy editing, production, (e-)printing, marketing and distribution”
- depository – “a place where something is deposited, as for storage, safekeeping or preservation”
- one-to-many vs. many-to-one; push vs. pull
- for polished products vs. for things still in progress

*depositar*

Features and Show Cases



# Search and Data Discovery

- full text search
- multiple filters
- spatial and temporal constraints

The screenshot displays a web application interface for data discovery. The header features the title "跨領域區域研究資料集" (Cross-domain Regional Research Data Collection) and navigation links for "Datasets", "Organizations", "Groups", and "Help". A search bar is located in the top right corner.

The main content area is titled "Datasets" and includes a "Filter by location" section with a "Clear" button. Below this is a map of Taiwan with a red hatched area indicating a selected region. The map is credited to "Map tiles & Data by OpenStreetMap, under CC BY-SA".

Below the map is a search bar labeled "Search datasets...". The results section shows "51 datasets found" and is ordered by "Relevance". The first two results are:

- 昭和年間灌漑地給水區分圖：麻豆  
1929年麻豆灌漑地給水區分圖  
TIF
- 昭和年間灌漑地給水區分圖：西港  
1929年西港灌漑地給水區分圖

On the left side of the results, there are filters for "Temporal Search" (with a "Clear" button and a date range selector) and "Organizations".



# Data Preview

## 臺南市里界圖

[Manage](#)[Go to resource](#)

URL: <https://data.depositar.io/dataset/76a232e5-a9c1-4dde-8d4c-6b58629f33ca/resource/c2bbe543-dc9d-41c2-82d5-d16a93b87835/do...>

屬性包含：「VILLAGE(里名)」、「TOWN(區名)」、「COUNTY(縣市名)」

📍 SHP

Embed



# Metadata for Datasets

- designed for cross-disciplinary research
- emphasizing spatiotemporal description
- nice user interface for metadata authoring

Language:

### Temporal Information (Time Period of Dataset)

Time Period Shortcut:

Temporal Resolution:


Start Time:

End Time:

**Temporal Information Help:**

- i** This shortcut provides some historical periods for filling temporal information of the dataset.
- i** Depend on the temporal resolution setting. Acceptable formats: 'YYYY', 'YYYY-MM', or 'YYYY-MM-DD'.
- i** Depend on the temporal resolution setting. Acceptable formats: 'YYYY', 'YYYY-MM', or 'YYYY-MM-DD'.

### Spatial Fields



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

**Spatial:** [{"type": "Polygon", "coordinates": [[[120.05825042724611, 22.969773432534776], [120.05825042724611, 23.09678621760499], [120.21068572998048, 23.09678621760499], [120.21068572998048, 22.969773432534776], [120.05825042724611, 22.969773432534776]]]]}]

This column is used for geo-indexing the dataset. [Click for details.](#)

- Bilingual
  - English
  - Chinese
- Metadata
- User interface

▼ Data Type
Books (455)
Vector (144)
Statistics (103)
Pictures (Spatial) (34)
Pictures (Non spatial) (25)
▼ Language
Chinese (730)
Dutch (22)
English (8)
Spanish (Castilian) (1)
▼ Historical Material
Local chronicles in Qing dynasty (36)
Maps (20)
Japan officials (19)
Newspapers (16)
Inscriptions (9)
Taiwanese Governor Office Files (9)
Dutch Formosa (5)
Officials in postwar period (1)

▼ 資料類型
文獻書籍 (455)
向量資料 (144)
統計資料 (103)
圖像 (空間類) (34)
圖像 (非空間類) (25)
▼ 語言
華語/中文 (730)
荷蘭語 (22)
英語 (8)
西班牙語 (1)
▼ 使用史料
清代方志 (36)
地圖 (20)
日治出版品與官方資料 (19)
報紙 (16)
碑文 (9)
台灣總督府檔案 (公文類纂、府報、調查報告、職員錄、衛生法規) (9)
荷治時期檔案 (5)
戰後官方資料與鄉鎮志 (1)



# Simplified Metadata Authoring

- One set of simple metadata for all datasets; three categories:
  - **Basic metadata:** title, description, data type, ...
  - **Descriptive metadata:** language, temporal, and spatial information, keywords, ...
  - **Management metadata:** license, author, created time, organization, maintainer, ...

# Wikidata-powered Keywords

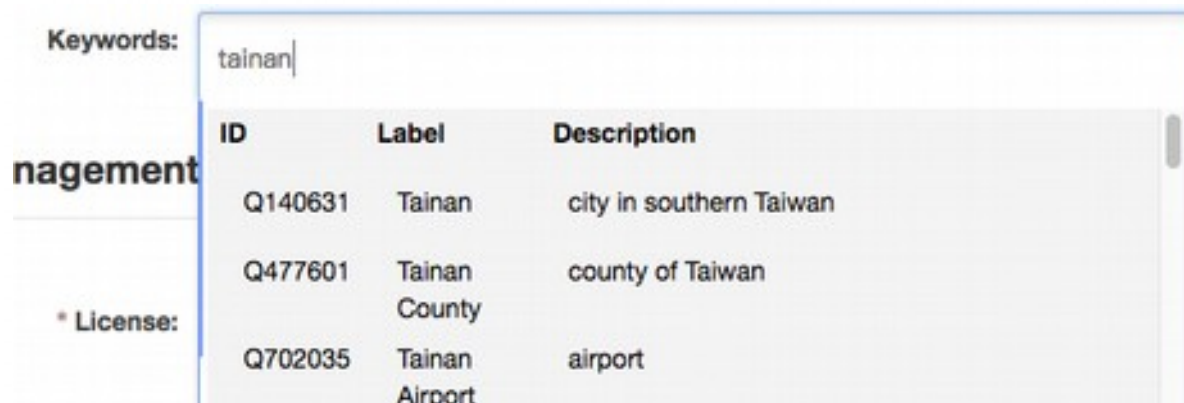
- Keywords
  - controlled vocabularies for tagging datasets
  - DIY vocabulary design: a never-ending story ...
- Use [Wikidata](#) as the source for keywords
  - 47M+ entries
  - multilingual
  - semantic relations enable data inference
    - e.g. Taipei is part of Taiwan





# Wikidata Entries as Keywords

Search and select keywords:

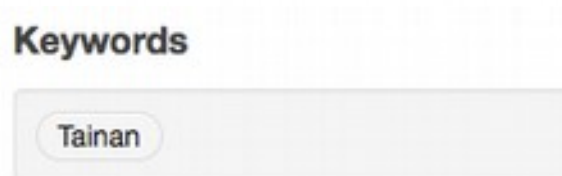


A screenshot of a Wikidata search interface. The search bar contains the text 'tainan'. Below the search bar, a table of results is displayed. The table has three columns: 'ID', 'Label', and 'Description'. The results are as follows:

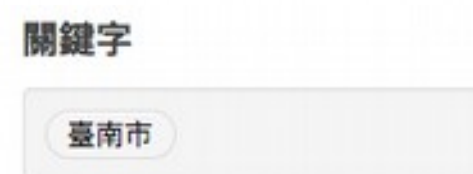
ID	Label	Description
Q140631	Tainan	city in southern Taiwan
Q477601	Tainan County	county of Taiwan
Q702035	Tainan Airport	airport

Keywords (as Wikidata IDs) are stored.

Viewed in English:



Viewed in Chinese:



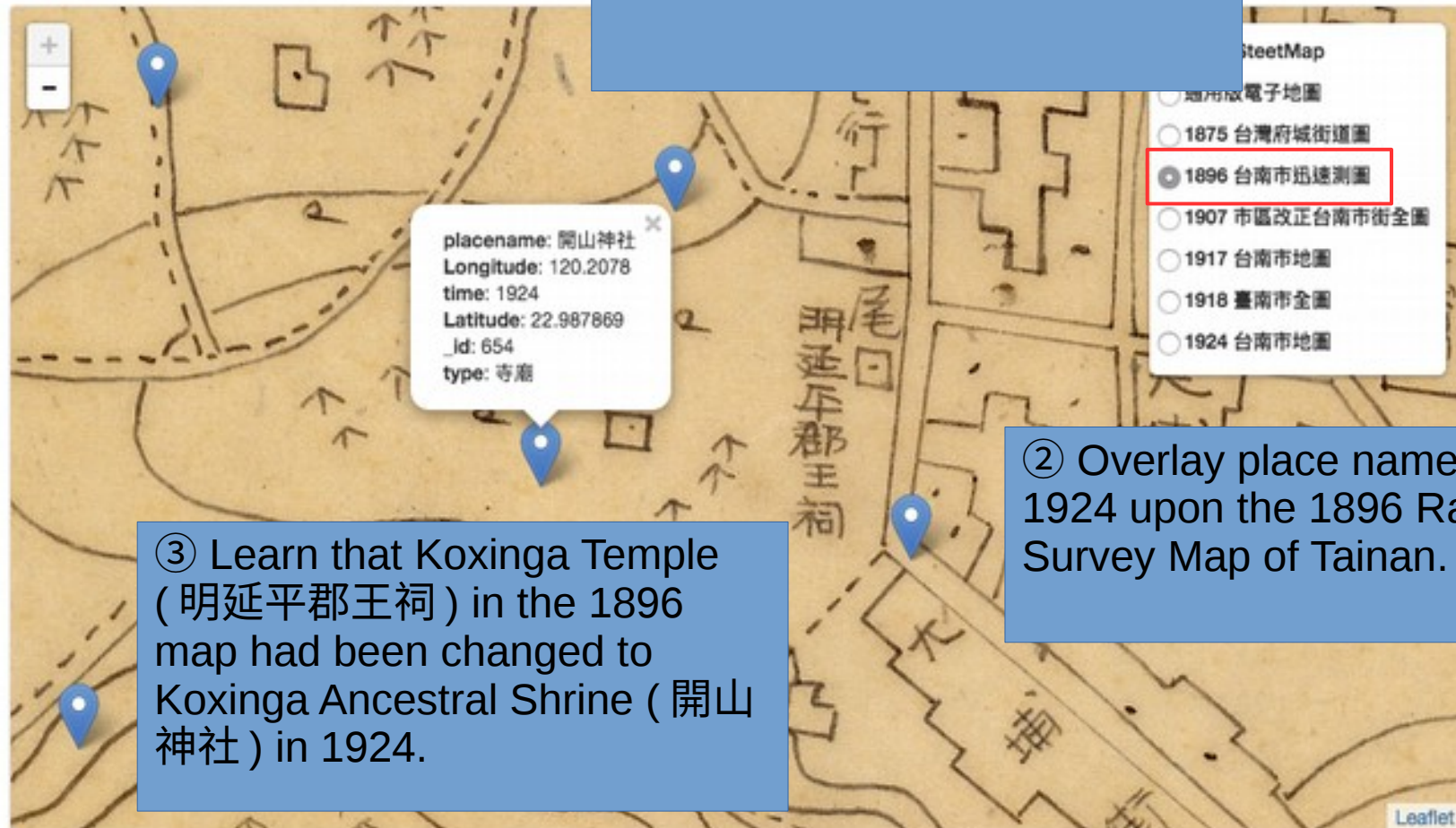
# Place Names & Maps – A Showcase

<https://data.depositar.io/dataset/place-names-in-west-central-district-of-tainan>

Source: Place Names in West Central District of Tainan

All 1875 1896 1907 1917 1924 資料瀏覽器

Add Filter



① Place names extracted from a map of Tainan in 1924 (displayed as blue place marks).

② Overlay place names from 1924 upon the 1896 Rapid Survey Map of Tainan.

③ Learn that Koxinga Temple (明延平郡王祠) in the 1896 map had been changed to Koxinga Ancestral Shrine (開山神社) in 1924.

# Roadkill Observations – A Showcase

<https://data.depositar.io/dataset/2016>

The screenshot shows the dataset page for 'Roadkill Observations 2016'. The page is in Chinese and includes a search bar, navigation links, and a sidebar with social media and license information. The main content area displays the dataset title, a brief description, and various metadata sections.

### 路殺社範例資料集-2016

路殺社範例資料集-2016

透過研究戶提供野外動物遭車輛撞擊紀錄之現象，並以結構化方式記錄相關資訊

#### Data and Resources

路殺社範例資料集

#### Tags

roadkill

#### Basic Information

Data Type: Statistics  
Language: Chinese

#### Temporal Information (Time Period of Dataset)

Start Time: 2016

#### Spatial Fields

Spatial: show more  
X.min: 118.35888862609865  
X.max: 122.68355369567873  
Y.min: 21.45913969962141  
Y.max: 26.4432480769561

#### Management Information

Author: 路殺社

Powered by **ckan**  
Source code available on [GitHub](#) |  
Language: English

The screenshot shows the dataset page for 'Roadkill Observations 2016' with a data table and additional information. The table lists 20 records with columns for ID, ID, Species, Species (Chinese), Species (English), Date, Location, and Count. The 'Additional Information' section provides details about the dataset's update and creation dates, format, encoding, and coordinate system.

### 路殺社範例資料集

From the dataset abstract

透過研究戶提供野外動物遭車輛撞擊紀錄之現象，並以結構化方式記錄相關資訊

Source: 路殺社範例資料集 2016

map

Embed

Add Filter

Grid Graph Map 3218 records - 1 - 20 - Search data... Go + Filters

ID	ID	科名	科名 (C)	物種名	物種名 (E)	紀錄時間	地點	數量	數量
1	24933	Butoridae	鰻鰻科	Rana sakoi	長腳赤蛙	2016-01	宜蘭縣員	121,636	24,754443
2	24934	Muscida	蠅科	Furcula p.	白邊飛	2016-01	臺南市	122,08166	25,62861
3	24935	Muridae	鼠科	Sandrat	海鼠	2016-01	臺南市	120,195	22,894976
4	24944	Tajidae	靈貓科	Mogera l.	台灣靈貓	2016-01	台中市	120,768	24,173821
5	24971	Colebridae	黃蝶科	Lycodon	山烙石蛇	2016-01	新竹縣	120,39417	24,886021
6	24972	Viperidae	蝮蛇科	Troxonez	臺灣滑竹蝮	2016-01	宜蘭縣	120,374	24,702621
7	25004	Butoridae	鰻鰻科	Bufo san.	黑斑蟾	2016-01	台北市	121,538	25,127258
8	25006	Potamidae	王鰻科	Gambusia	暹羅羅漢魚	2016-01	臺南市	120,408	22,726730
9	25008	Laniidae	鷹科	Lanius c.	紅尾伯勞	2016-01	台南市	120,349	22,291861
10	25009	Muridae	鼠科	Rattus n.	暹羅	2016-01	台中市	120,734	24,508996
11	25023	Rubidae	刺蝟科	Amaurus	台灣刺蝟	2016-01	金門縣	118,412	24,508996
12	25025	Columbidae	鳩科	Streptop.	珠頸斑鳩	2016-01	金門縣	118,319	24,471915
13	25026	Butoridae	鰻鰻科	Dutoghya	黑斑蟾	2016-01	台北市	121,538	25,08142
14	25027	Columbidae	鳩科	Columba	家鴿	2016-01	新北市	121,584	24,99522
15	25028	Rhacophoridae	樹蛙科	Rhacoph.	台北樹蛙	2016-01	臺南市	121,734	25,091321
16	25029	Rhacophoridae	樹蛙科	Rhacoph.	台北樹蛙	2016-01	臺南市	121,734	25,091321
17	25030	Rhacophoridae	樹蛙科	Rhacoph.	台北樹蛙	2016-01	臺南市	121,734	25,091321
18	25032	Colebridae	黃蝶科	Phyllorh.	透山刀	2016-01	台中市	120,7871	24,10225
19	25033	Singidae	鶯科	Singidex	鶯	2016-01	台北市	121,586	24,982227
20	25034	Struthidae	鸚鵡科	Acridothera	第八	2016-01	金門縣	118,413	24,507908

#### Resources

Additional Information

Last updated	June 4, 2016
Created	June 4, 2016
Format	CSV
Encoding	UTF-8
Coordinate Systems	EPSG: 4326
License	License Not Specified

Powered by **ckan**  
Source code available on [GitHub](#) |  
Language: English



# Roadkill Observations – A Showcase

<https://data.depositar.io/dataset/2016>

Add Filter

Grid Graph Map 3218 records « 1 – 20 » 🔍 Search data ... Go » Filters

_id	id	科名	科名 (...)	物種名	物種名...	紀錄時間	地點	經度	緯度
1	24933	Bufo	蟾蜍科	Rana lon...	長腳赤蛙	2016-01...	宜蘭縣員...	121.636...	24.754443
2	24934	Muscica...	鶺鴒科	Turdus p...	白腹鶺鴒	2016-01...	基隆市中...	122.08166	25.62861
3	24935	Muridae	鼠科	Bandicot...	鬼鼠	2016-01...	高雄市茄...	120.195...	22.894975
4	24944	Talpidae	鼯鼠科	Mogera i...	台灣鼯鼠	2016-01...	台中市北...	120.788...	24.173821
5	24971	Colubridae	黃頰蛇科	Lycodon...	白梅花蛇	2016-01...	新竹縣峨...	120.98417	24.698021
6	24972	Viperidae	蝮蛇科	Trimeres...	赤尾青竹絲	2016-01...	苗栗縣頭...	120.974...	24.702631
7	25004	Bufo	蟾蜍科	Bufo ban...	盤古蟾蜍	2016-01...	台北市士...	121.538...	25.127258
8	25006	Potamidae	溪蟹科	Geothel...	黃綠澤蟹	2016-01...	高雄市大...	120.408...	22.725732
9	25008	Laniidae	伯勞科	Lanius c...	紅尾伯勞	2016-01...	台南市柳...	120.349...	23.261861
10	25009	Muridae	鼠科	Rattus n...	溝鼠	2016-01...	台中市潭...	120.724...	24.231545
11	25023	Rallidae	秧雞科	Amauror...	白胸苦惡鳥	2016-01...	金門縣金...	118.412...	24.508996
12	25025	Columbi...	鳩鴿科	Streptop...	珠頸斑鳩	2016-01...	金門縣金...	118.319...	24.471015
13	25026	Bufo	蟾蜍科	Duttaphr...	黑眶蟾蜍	2016-01...	台北市文...	121.538...	25.008142
14	25027	Columbi...	鳩鴿科	Columba...	岩鴿	2016-01...	新北市貢...	121.984...	24.99522
15	25028	Rhacoph...	樹蛙科	Rhacoph...	台北樹蛙	2016-01...	基隆市暖...	121.734...	25.091321
16	25029	Rhacoph...	樹蛙科	Rhacoph...	台北樹蛙	2016-01...	基隆市暖...	121.734...	25.091321
17	25030	Rhacoph...	樹蛙科	Rhacoph...	台北樹蛙	2016-01...	基隆市暖...	121.734...	25.091321
18	25032	Colubridae	黃頰蛇科	Ptyas dh...	過山刀	2016-01...	台中市太...	120.7971	24.10225
19	25033	Strigidae	鴞鴞科	Strigidae	鴞鴞科	2016-01...	台北市文...	121.586...	24.982227
20	25034	Sturnidae	椋鳥科	Acridoth...	家八哥	2016-01...	金門縣金...	118.413...	24.507908



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

- Latitude / Longitude fields
- GeoJSON field

Latitude field

緯度

Longitude field

經度

Update

- Auto zoom to features
- Cluster markers

### Filters

Add filter

科名 (中文) ×

蟾蜍科

Update





- Latitude / Longitude fields
- GeoJSON field

Latitude field

緯度

Longitude field

經度

Update

- Auto zoom to features
- Cluster markers

### Filters

Add filter

科名 (中文) ×

蟾蜍科

Update

Grid

Graph

Map

3 records

«

1

- 3

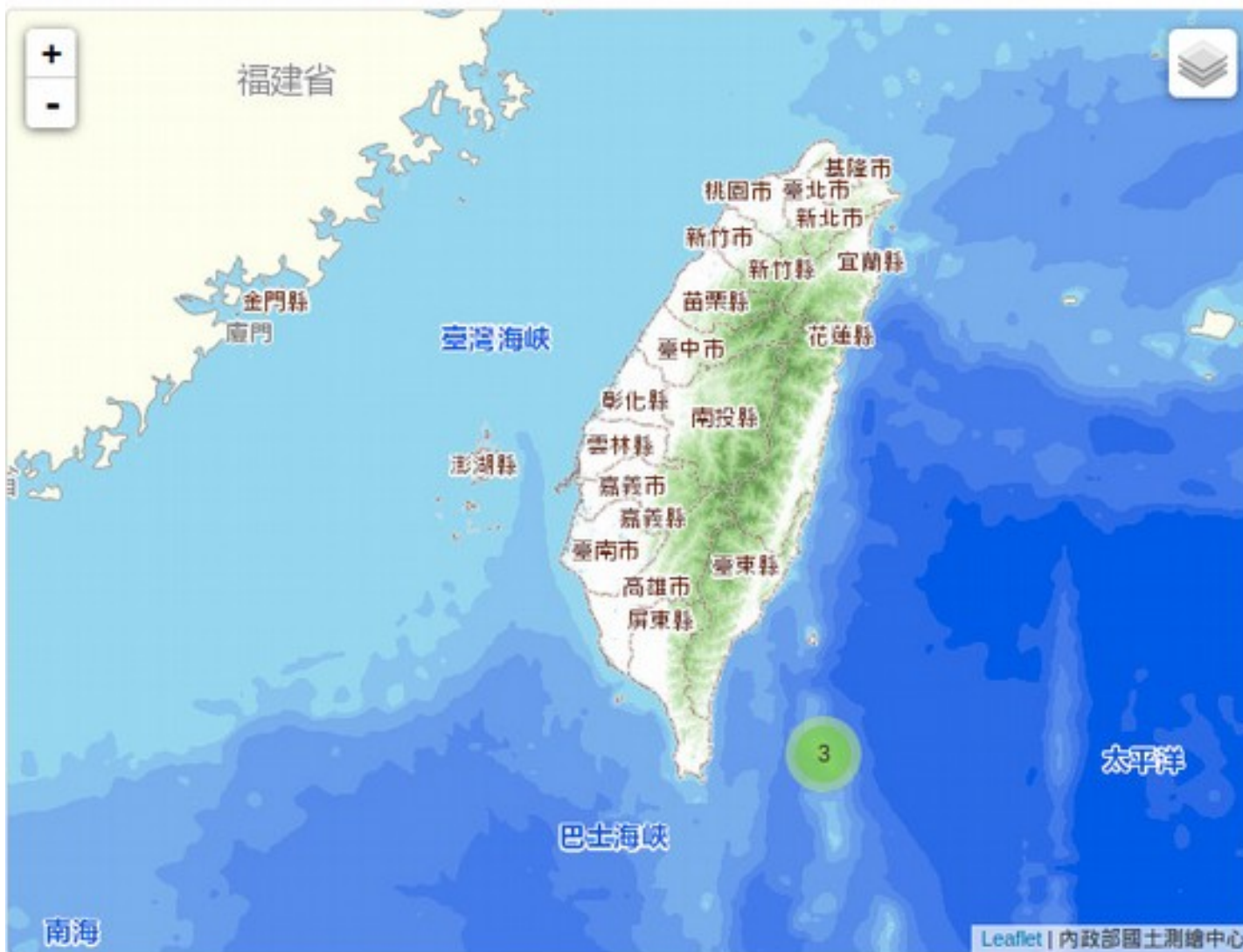
»

Q

Search data ...

Go »

Filters



Latitude / Longitude fields

GeoJSON field

Latitude field

緯度

Longitude field

經度

Update

Auto zoom to features

Cluster markers

## Filters

Add filter

科名 (中文) ×

陸寄居蟹科

Update



Latitude / Longitude fields  
 GeoJSON field

Latitude field

緯度

Longitude field

經度

Update

Auto zoom to features  
 Cluster markers

Filters

Add filter

科名 (中文) ×

陸寄居蟹科

Update



Grid

Graph

Map

3 records

«

1

- 3

»



Search data ...

Go »

Filters



經度: 121.510102  
 物種名 (中文): 短掌陸寄居蟹  
 緯度: 22.070254  
 地點: 台東縣蘭嶼鄉  
 科名 (中文): 陸寄居蟹科  
 紀錄時間: 2016-05-02T00:00:00  
 物種名: *Coenobita brevimanus*  
 \_id: 1795  
 科名: Coenobitidae  
 id: 27120



Latitude / Longitude fields

GeoJSON field

Latitude field

緯度

Longitude field

經度

Update

Auto zoom to features

Cluster markers

## Filters

Add filter

科名 (中文) ×

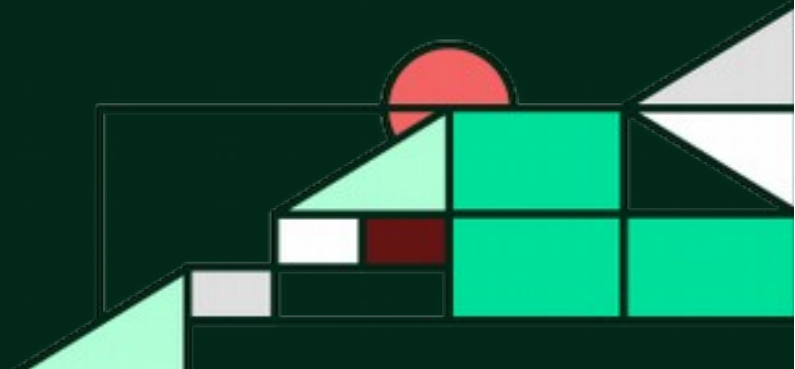
陸寄居蟹科

Update



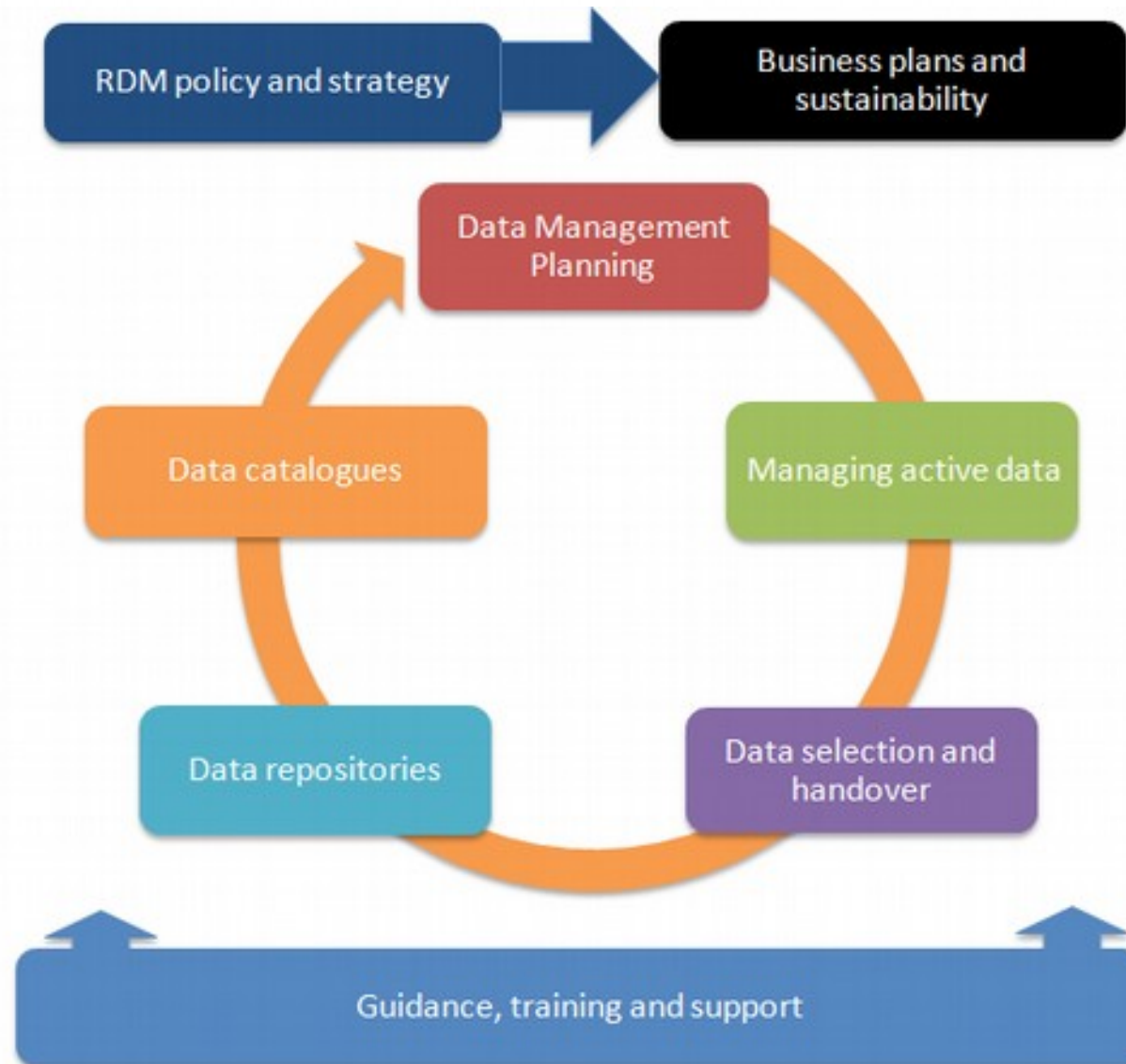
Leaflet | 內政部國土測繪中心

# Collaboration in Soundscape Monitoring



# Research Data Management (RDM)

<http://www.dcc.ac.uk/resources/how-guides/how-develop-rdm-services>





# Data Management Plan

- **Data Collection**
  - What data will you collect or create?
  - How will the data be collected or created?
- **Documentation and Metadata**
  - What documentation and metadata will accompany the data?
- **Ethics and Legal Compliance**
  - How will you manage any ethical issues?
  - How will you manage copyright and Intellectual Property Rights (IP/IPR) issues?
- **Storage and Backup**
  - How will the data be stored and backed up during the research?
  - How will you manage access and security?
- **Selection and Preservation**
  - Which data are of long-term value and should be retained, shared, and/or preserved?
  - What is the long-term preservation plan for the dataset?
- **Data Sharing**
  - How will you share the data?
  - Are any restrictions on data sharing required?
- **Responsibilities and Resources**
  - Who will be responsible for data management?
  - What resources will you require to deliver your plan?

# data.depositar.io

## Topics

- Asian Soundscape Monitoring Network
- Natural and physical sciences

### Project Asian Aquatic Soundscape

Dataset  
site1

Dataset  
site2

⋮

### Project Asian Forest Soundscape

Dataset  
site1

Dataset  
site2

⋮

### Project Ultrasoundscape in Taiwan

Dataset  
site1

Dataset  
site2

⋮

## Keywords

- biodiversity
- geophony
- biophony
- anthrophony
- Vietnam 、 Thailand
- Soundscape ...

## Tags

- biological sounds
- long-term monitoring
- Chiroptera ...

## Formats

- csv 、 mat ...

# Data on *depositar*

## Asian Soundscape Monitoring Network

<https://data.depositario.io/group/asian-soundscape-monitoring-network>

### Asian Soundscape Monitoring Network

Followers  
**0**

Datasets  
**4**

#### Projects

Asian Forest Sound... (2)

Asian Aquatic Sound... (1)

Ultrasoundscape in ... (1)

#### Topics

08. 自然與物理科學 / Natur... (4)

Asian Soundscape Mo... (4)

#### Keywords

soundscape (4)

#### Tags

biological sounds (2)

Soundscape (2)

algae reef (1)

### 4 datasets found

#### The soundscape of Lienhuachih Rese

Habitat of the monitoring site The monitoring site local dominated by tree species of Lauraceae and Fagaceae

WAV

#### 自然谷聲景監測

與台灣環境資訊協會共同合作新竹縣芎林鄉自然谷環境

CSV MAT

#### Ultrasoundscape in Dongyanshan For

Basic information Site code : TW\_BRCAS\_TYDY Lati Altitude : 854 Habitat : Mixed broadleaf forest Device Serial...

CSV

#### Algae Reef Soundscape

Underwater soundscapes of algae reefs at Taoyuan, 1300STD recorders were used to collect underwater re

CSV mat

## Algae Reef Soundscape

Followers

0

Follow

Project



## Asian Aquatic Soundscape

There is no description for this project.

Social

Google+

Twitter

Facebook

License

CC-BY 4.0

Dataset extent



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

Dataset

Topics

Activity Stream

History

Manage

## Algae Reef Soundscape

Underwater soundscapes of algae reefs at Taoyuan, Taiwan.

**Acoustic Recorders.** SoundTrap 300STD recorders were used to collect underwater recordings. Two SoundTrap recorders were used in three surveys: SoundTrap 300STD #1 SN1208004643; SoundTrap 300STD #2 SN805347354.

**Configuration of Audio Recording.** (1) Duration: 5 min. (2) Sampling Rate: 96kHz. (3) Channels: 1. (4) File Format: WAV (converted by SUD). (5) Audio Gain: High. (6) High Pass Filter: Off.

**Field Deployment.** Each SoundTrap recorder was fixed vertically on an angle steel at the bottom. The recorder was exposed in the air during low tide, so the collection of underwater recordings were only possible 3 hours before and after the high water.

**Data Processing.** We used the LTSA\_gui (<https://github.com/schonkopf/long-term-spectrogram>) to visualize the spectral-temporal change of long-duration recordings. By the median-based long-term spectrogram, we employed the periodicity-coded non-negative matrix factorization (<https://github.com/schonkopf/soundscape-viewer>) to separate the audio data into two components: (1) high-frequency biological chorus, and (2) low-frequency ambient noise. The relative intensities of the two components were analyzed.

### Data and Resources

#### Spatiotemporal change of soundscape

This csv describes the Location, Latitude, Longitude, Survey Number, Tide...

Explore

#### Field recordings at BY

Audio archive on Asian Soundscape

Explore

#### Field recordings at G1

Audio archive on Asian Soundscape

Explore

#### Field recordings at G2

Audio archive on Asian Soundscape

Explore

#### Field recordings at YX

Audio archive on Asian Soundscape

Explore

#### Field recordings at YA

Audio archive on Asian Soundscape

Explore

#### Long-term spectrogram of the Survey 1 at BY

Please use Soundscape\_Viewer (<https://github.com/schonkopf/soundscape-viewer>)...

Explore

#### Long-term spectrogram of the Survey 1 at G1

Please use Soundscape\_Viewer (<https://github.com/schonkopf/soundscape-viewer>)...

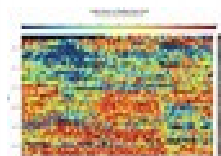
Explore

Basic site information

Spatiotemporal change of soundscape (.csv)

Audio archive (Pumilio)

Visualization of acoustic data (.mat)





# Lessons Learned

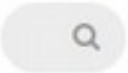
- Communication is always important
- Plan early for integration and cooperation
- Adequate training and support is essential
- Patience and understanding



# *depositar* – An Experiment in Progress

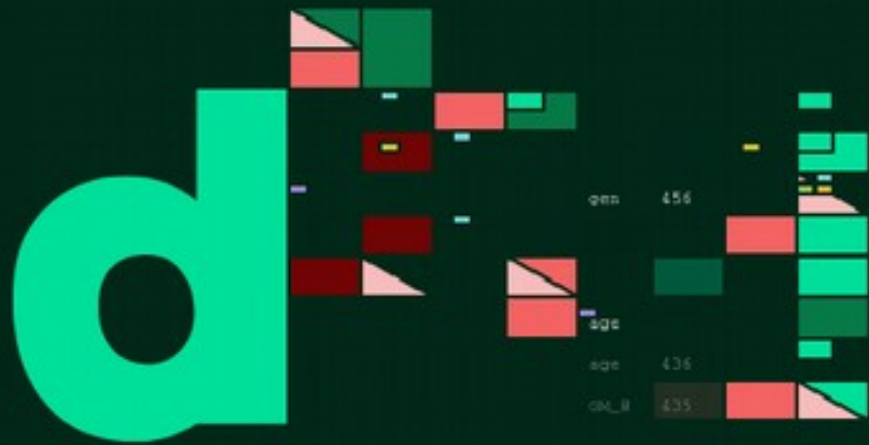
- Challenge: Transition from a tool to a service
  - maintaining a stable service by and for resource-poor academic institutes, projects, and individuals
- Understand and respond to user needs
  - serving small projects and emerging topics
  - multilingual support, batch dataset upload
  - data preview and analysis; links to/from external resources
- Toward a collaborative infrastructure from below

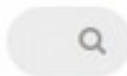




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# Topics

Roadkill



General reference



Culture and the arts



Geography and places



Health and fitness



History and events



Human activities



Mathematics and logic



Natural and physical sciences



People and self



Philosophy and thinking



Religion and belief systems

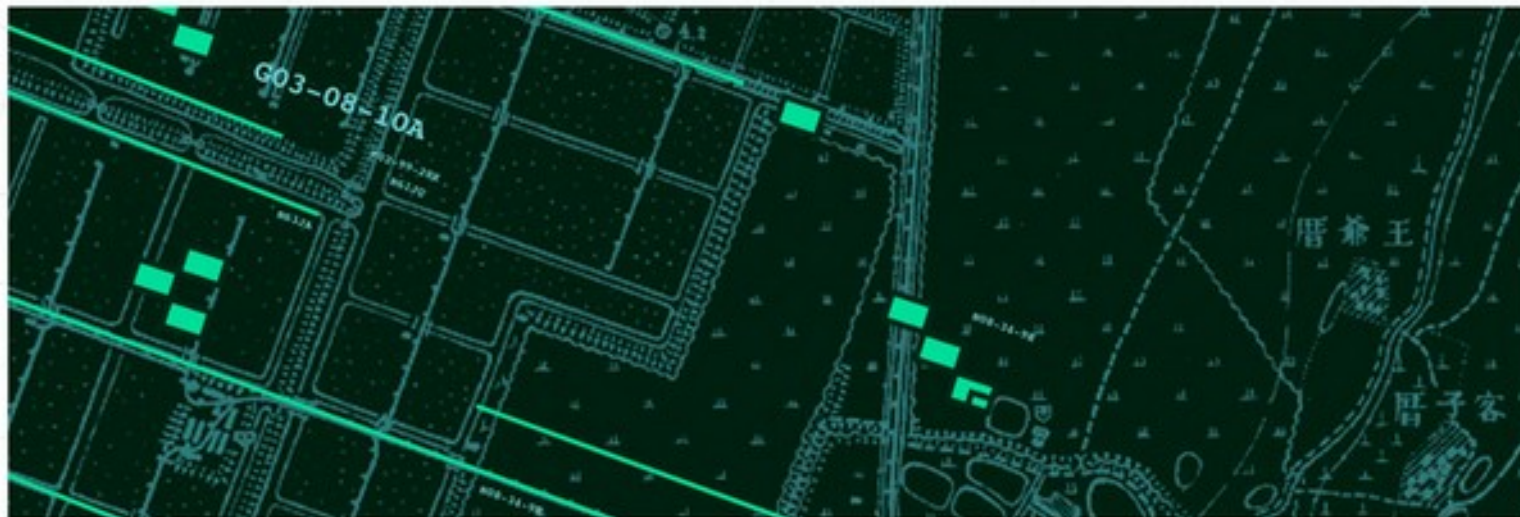


Society and social sciences



Technology and applied sciences

## Selected Datasets



### Taiwan History and Culture in Time and Space

Do you know that there are ancient waterway routes around Taiwan?

Have you heard about the routes for gold prospecting in Eastern Taiwan during the Dutch Formosa period?

# Partners

[Center for GIS, RCHSS, Academia Sinica](#)

[Electronic Cultural Atlas Initiative \(ECAI\)](#)

[Chia-nan Interdisciplinary Project](#)

[Collaborative Zuojhen Project](#)

[Asian Soundscape Monitoring Network](#)

[Taiwan Roadkill Observation Network](#)

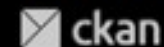


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[Source code available on GitHub](#)

Visual Design & UI by

[Dualai Studio](#)





# Infrastructure from Below

- Research data management is infrastructure work
  - basic but not sexy; mismatch in needs and resources
  - culture of collaboration; priority in coordination
  - need to be a community of practices
- Infrastructure with small pieces from below
  - common licenses, vocabularies, formats, protocols, etc.
  - reusable tools (e.g. CKAN) and references (Wikidata)
  - resource pooling: people, CPU, storage, bandwidth, etc.
- engaging in communication: code, data, experience, etc.

# WIKIPEDIA

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*The Free Encyclopedia*  
4 000 000+ articles

## 日本語

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500 000+ 條目



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contents 内容

工具 tools

users 用户

服務 services



**WIKIMEDIA**  
FOUNDATION



Thank You!

<http://data.depositar.io/>

<http://demo.depositar.io/>

[data.contact@depositar.io](mailto:data.contact@depositar.io)

