



# PgMetadata

A  **QGIS** plugin to manage metadata  
for your **PostgreSQL** data 

*Etienne Trimaille & Michaël Douchin*

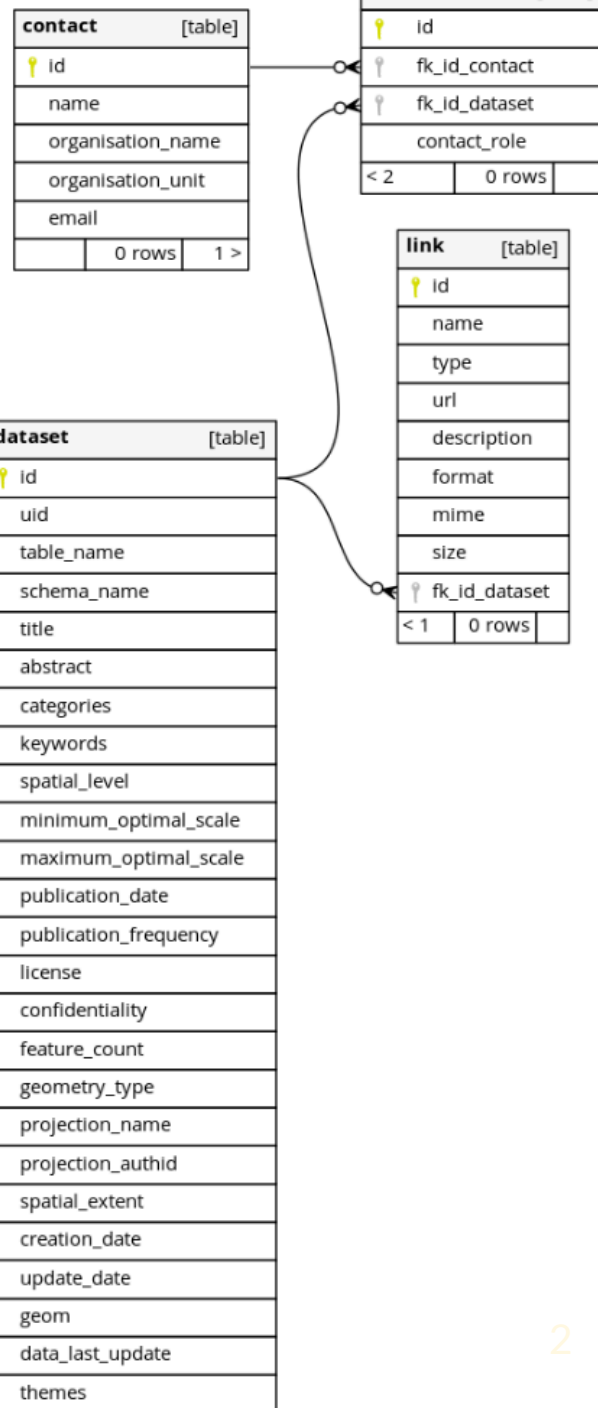




# What is Metadata ?

Help people to understand your data

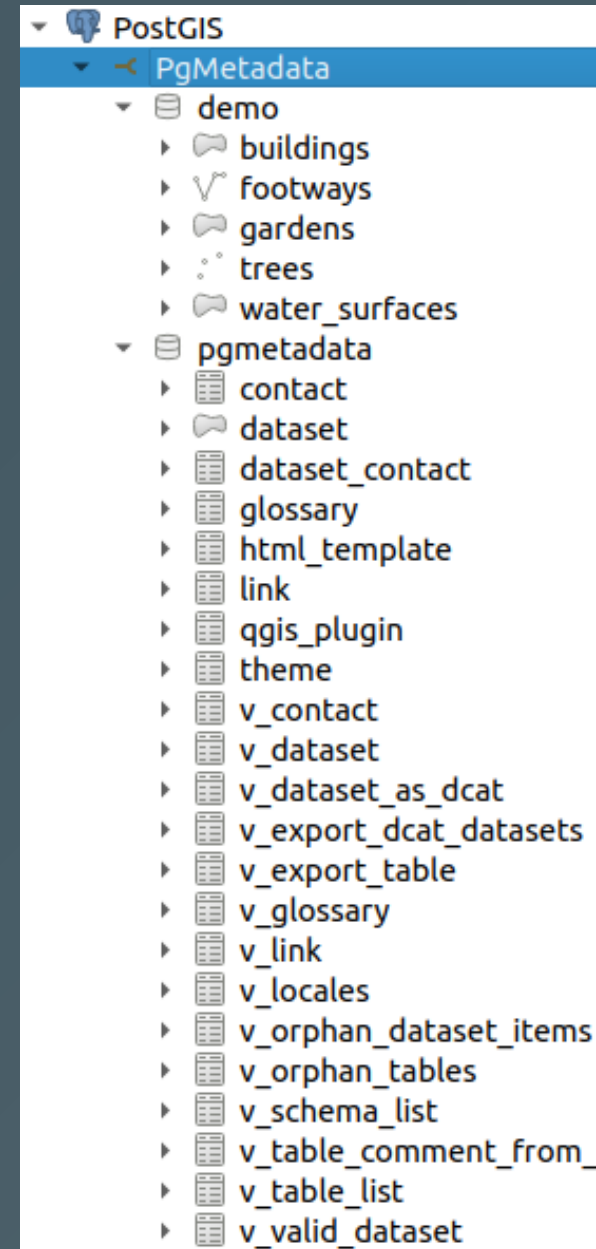
- **Identification:** Title, abstract, categories, themes, keywords, data last update,
- **Spatial properties:** spatial level, optimal scales,
- **Publication:** date, frequency, license, confidentiality
- **Computed:** feature count, geometry type, projection name & code, extent
- **Contact(s):** owner, publisher, custodian, etc.
- **Link(s)** to resources, web pages, documents



# Pg Metadata

Designed for people using **PostgreSQL** to store their vector (& raster) data.

- **Centralized:** data & metadata in the **same database**
- **Accessible:** a PostgreSQL connection to share the metadata
- **PostgreSQL** rich features:
  - **SQL powered:** relations, constraints, views, functions, triggers
  - **Rights** & access control: readers VS editors
- **See & Edit** with your preferred SQL client:
  - Libreoffice, PgAdmin, psql, DBeaver,
  - **QGIS** with its powerful forms !
- **Backup & restore** metadata with your data

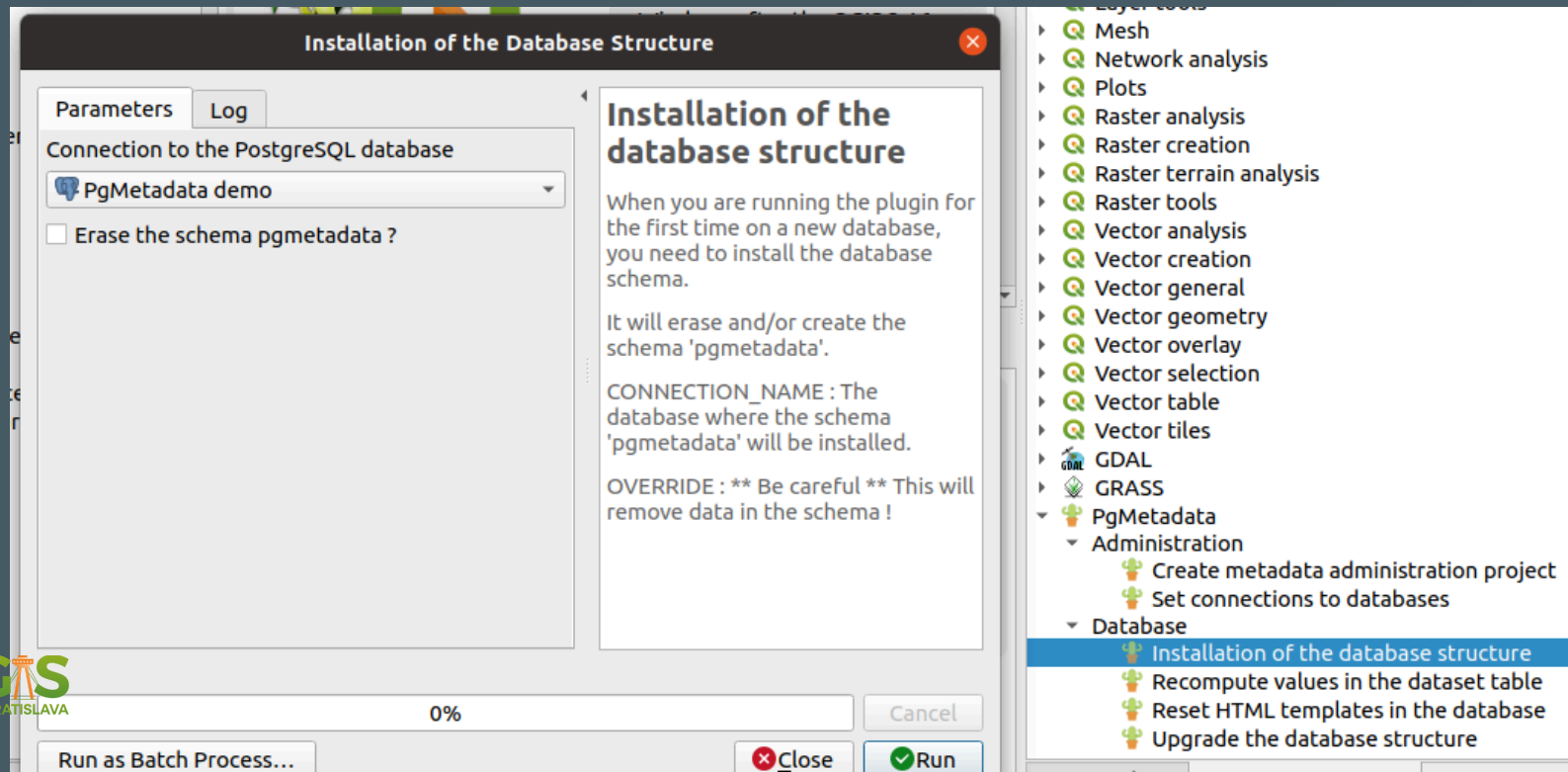


# PgMetadata for the GIS administrator

# Create the pgmetadata schema

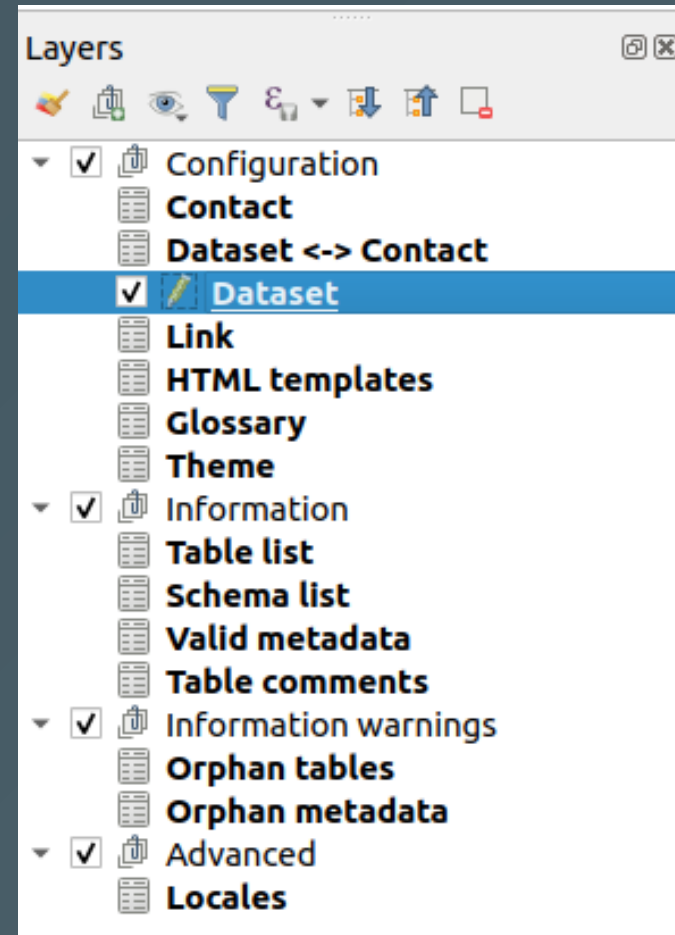
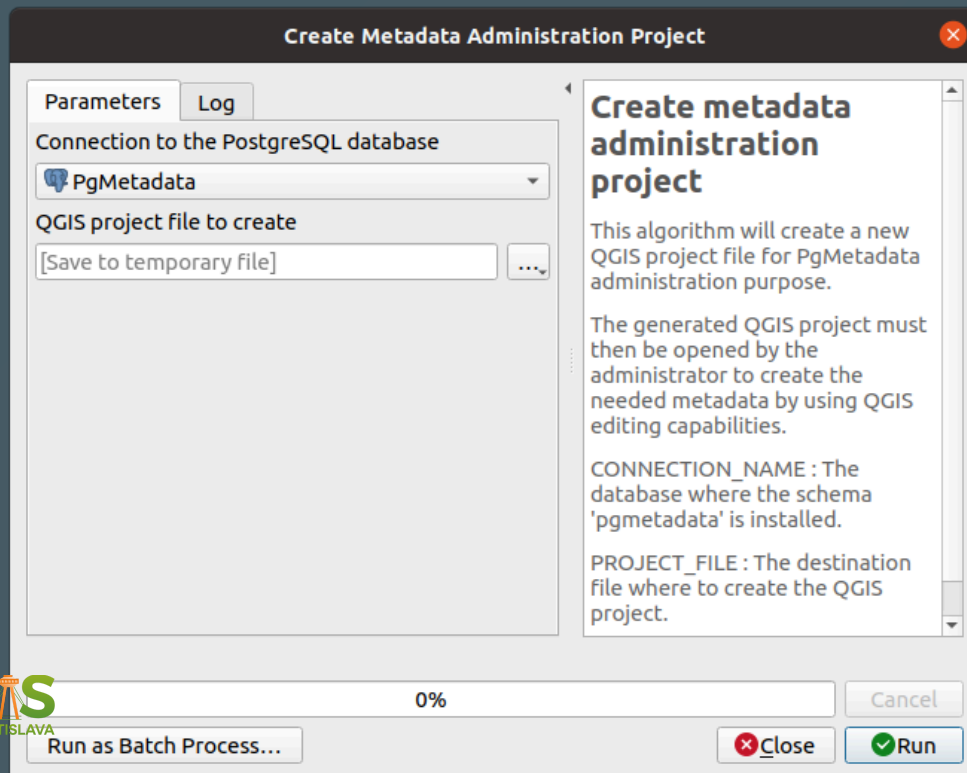
The plugin is using a **schema** `pgmetadata` in PostgreSQL.

A **QGIS processing algorithm** allows to create it in your database and fill it with the needed **tables, views and data** (glossary and translations)



# A QGIS admin project builder

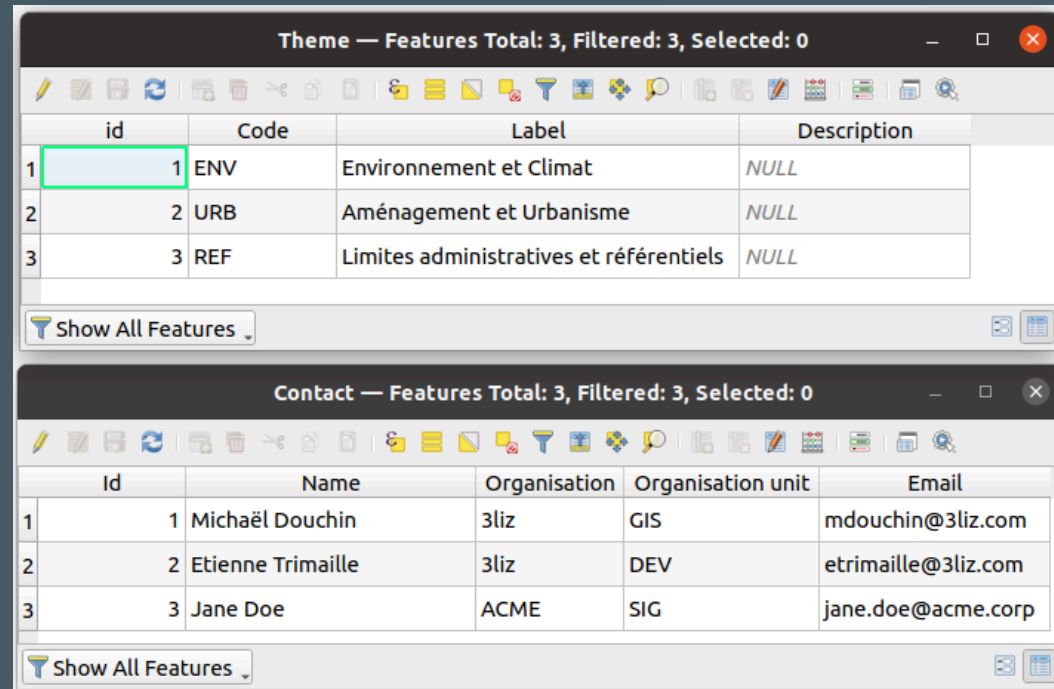
A QGIS processing algorithm to create a full featured **QGIS administration project** with rich forms:



# Prepare editing

Create the needed contextual data in the dedicated **tables**:

- User-defined **themes**
- **Contacts**: name, organisation, unit, email
- The existing **glossary** can be changed
- **Translations** can be added if missing



The screenshot shows two windows from the PgMetadata application. The top window is titled 'Theme — Features Total: 3, Filtered: 3, Selected: 0' and displays a table with 4 columns: id, Code, Label, and Description. The bottom window is titled 'Contact — Features Total: 3, Filtered: 3, Selected: 0' and displays a table with 5 columns: Id, Name, Organisation, Organisation unit, and Email. Both windows have a toolbar with various icons and a 'Show All Features' button at the bottom.

id	Code	Label	Description
1	ENV	Environnement et Climat	NULL
2	URB	Aménagement et Urbanisme	NULL
3	REF	Limites administratives et référentiels	NULL

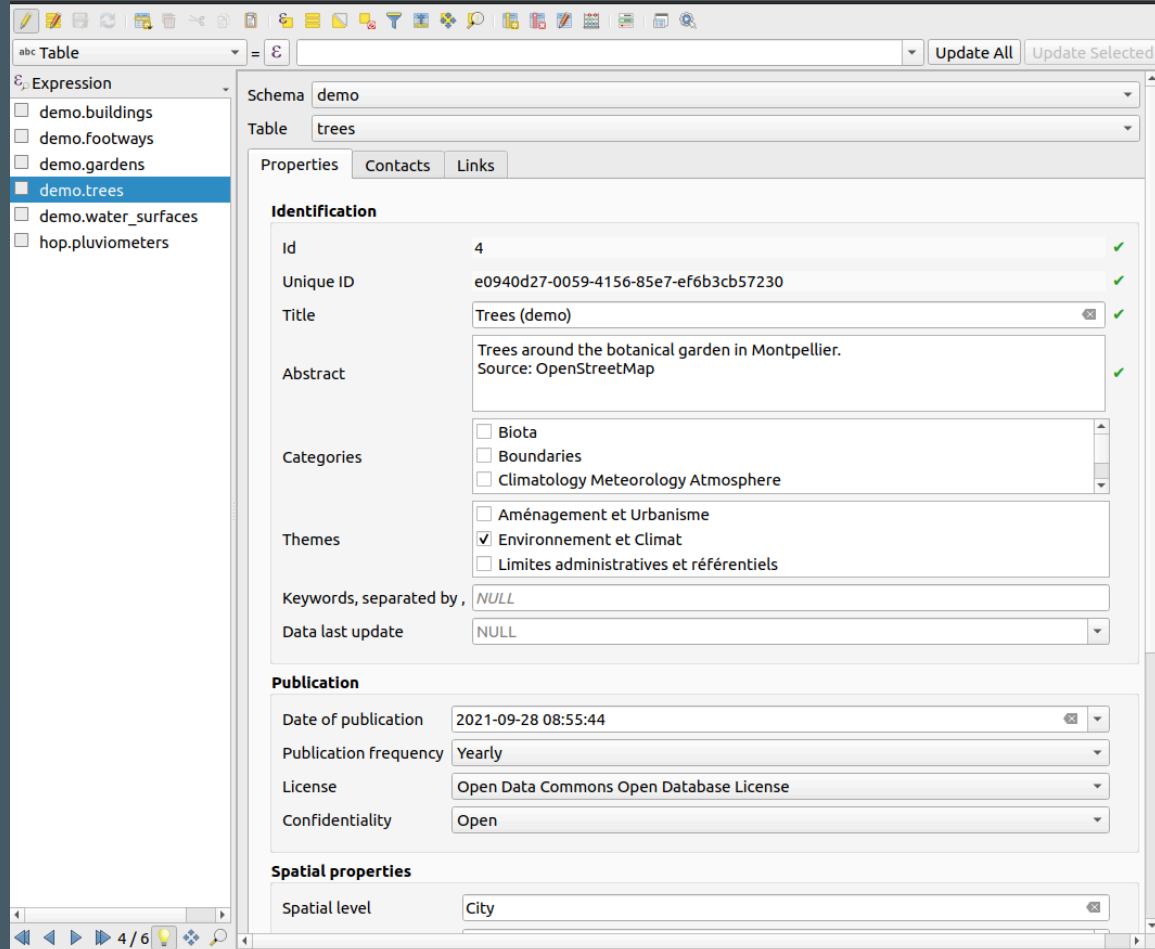
  

Id	Name	Organisation	Organisation unit	Email
1	1 Michaël Douchin	3liz	GIS	mdouchin@3liz.com
2	2 Etienne Trimaille	3liz	DEV	etrimaille@3liz.com
3	3 Jane Doe	ACME	SIG	jane.doe@acme.corp

# Edit your datasets with QGIS forms

Choose the **schema** and **table**, then edit:

- the main **fields**: title, abstract, keywords, etc.
- the **contacts** and their roles
- the **dataset** related links



The screenshot shows the QGIS PgMetadata interface. On the left, a tree view lists schemas and tables. The 'demo' schema is selected, and the 'trees' table is highlighted. The main panel displays the 'Properties' tab for the 'trees' table. The form is divided into several sections: Identification, Categories, Themes, Keywords, Publication, and Spatial properties. The 'Identification' section includes fields for Id (4), Unique ID (e0940d27-0059-4156-85e7-ef6b3cb57230), Title (Trees (demo)), Abstract (Trees around the botanical garden in Montpellier. Source: OpenStreetMap), Categories (Biota, Boundaries, Climatology Meteorology Atmosphere), Themes (Aménagement et Urbanisme, Environnement et Climat, Limites administratives et référentiels), Keywords, separated by (NULL), and Data last update (NULL). The 'Publication' section includes Date of publication (2021-09-28 08:55:44), Publication frequency (Yearly), License (Open Data Commons Open Database License), and Confidentiality (Open). The 'Spatial properties' section includes Spatial level (City).

abc Table

Expression

- ☐ demo.buildings
- ☐ demo.footways
- ☐ demo.gardens
- ☒ demo.trees
- ☐ demo.water\_surfaces
- ☐ hop.pluviometers

Schema demo

Table trees

Properties Contacts Links

**Identification**

Id 4 ✓

Unique ID e0940d27-0059-4156-85e7-ef6b3cb57230 ✓

Title Trees (demo) ✓

Abstract Trees around the botanical garden in Montpellier.  
Source: OpenStreetMap ✓

Categories

- ☐ Biota
- ☐ Boundaries
- ☐ Climatology Meteorology Atmosphere

Themes

- ☐ Aménagement et Urbanisme
- ☒ Environnement et Climat
- ☐ Limites administratives et référentiels

Keywords, separated by , NULL

Data last update NULL

**Publication**

Date of publication 2021-09-28 08:55:44

Publication frequency Yearly

License Open Data Commons Open Database License

Confidentiality Open

**Spatial properties**

Spatial level City





# Admin helpers

Some data are **calculated** from the table content:

- valid **unique id** for the dataset `e0940d27-0059-4156-85e7-ef6b3cb57230`
- layer extent, feature count, geometry type, projection id & name.
- creation and update timestamps, etc.

Some useful **views**:

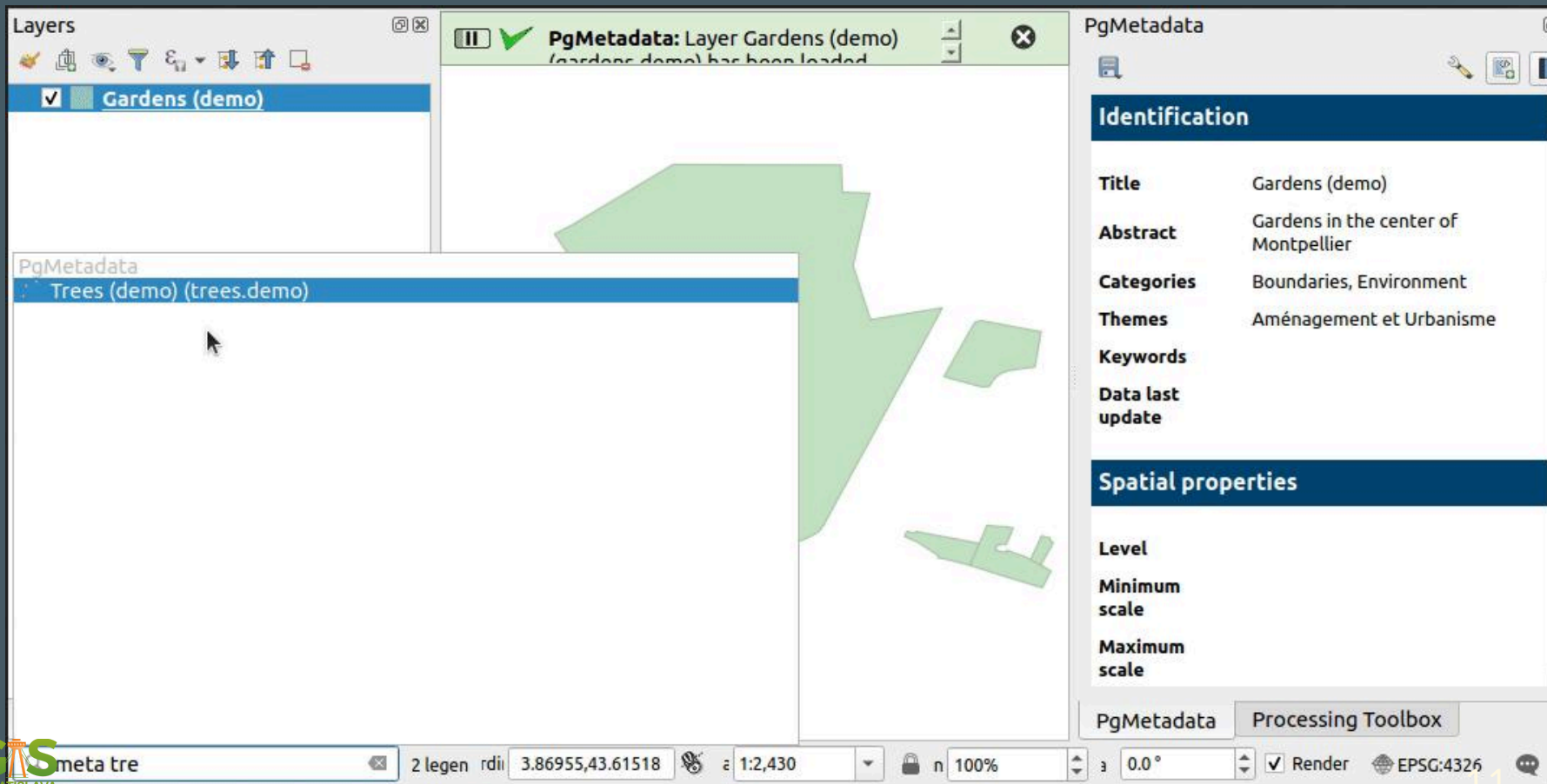
- **Orphan PostgreSQL tables**: no metadata exists in the dataset table for this tables
- **Orphan metadata**: a line exists in your dataset table, but no table corresponds in your database
- **Flat representation of the datasets**: lists the datasets with contacts and links aggregated

# PgMetadata for the GIS user in **QGIS**

# QGIS locator & Metadata panel

CTRL+K, type **meta**, find the table, add the layer & view metadata.

See [animated GIF](#)



The screenshot shows the QGIS interface with the PgMetadata panel open. The Layers panel on the left shows the 'Gardens (demo)' layer selected. The PgMetadata panel on the right displays the metadata for the 'Gardens (demo)' layer. The map area shows a green polygon representing the garden area.

**Layers**

- ✓ Gardens (demo)

**PgMetadata: Layer Gardens (demo)**  
(gardens\_demo) has been loaded

**PgMetadata**

**Identification**

<b>Title</b>	Gardens (demo)
<b>Abstract</b>	Gardens in the center of Montpellier
<b>Categories</b>	Boundaries, Environment
<b>Themes</b>	Aménagement et Urbanisme
<b>Keywords</b>	
<b>Data last update</b>	

**Spatial properties**

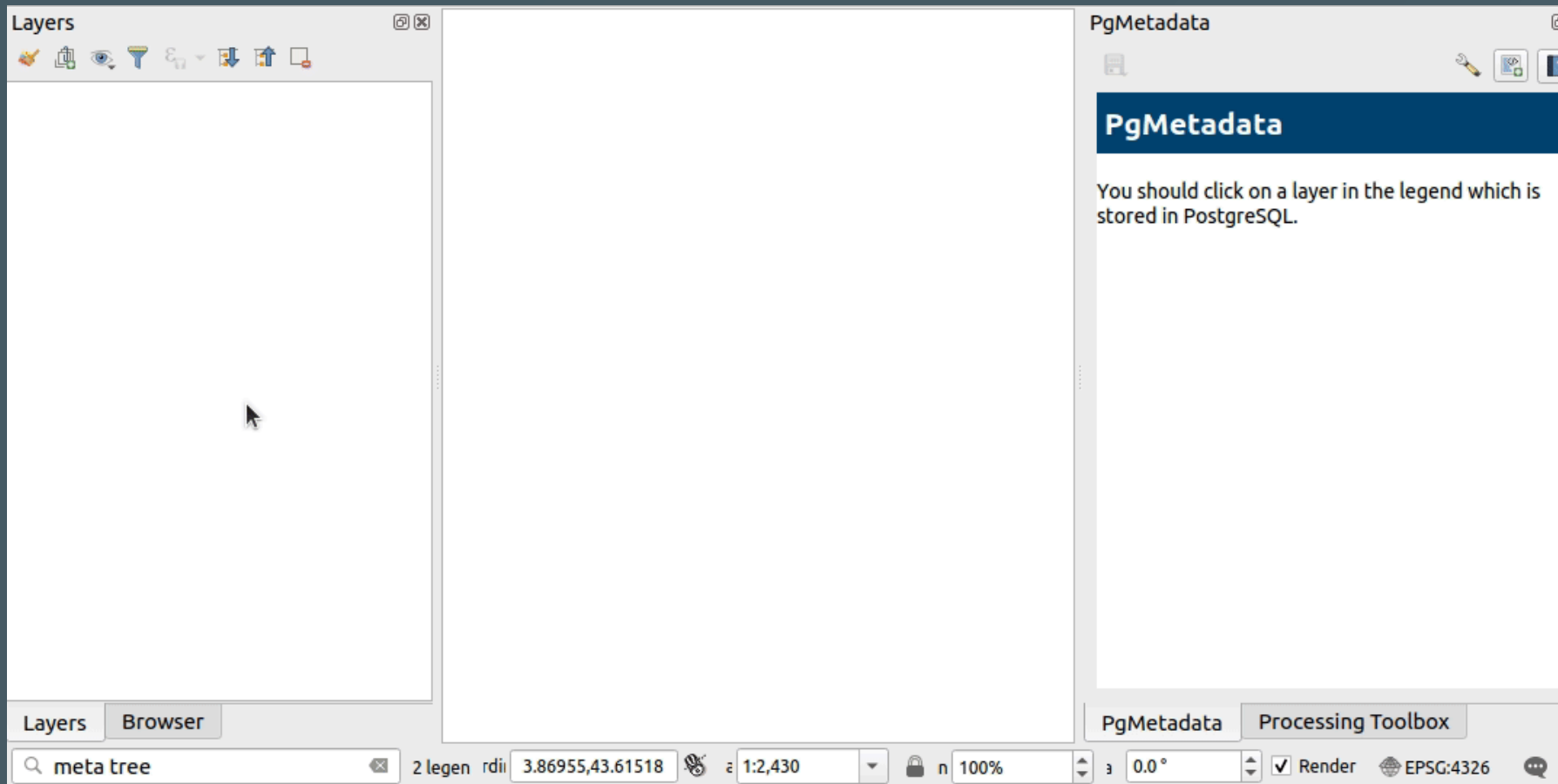
<b>Level</b>	
<b>Minimum scale</b>	
<b>Maximum scale</b>	

**PgMetadata** **Processing Toolbox**

meta tre 2 legen rdii 3.86955,43.61518 1:2,430 100% 0.0° Render EPSG:4326

# QGIS locator & Metadata panel

CTRL+K, type **meta**, find the table, add the layer & view metadata.





# Export

The user can export each dataset metadata to:

- HTML
- PDF
- DCAT <https://www.w3.org/TR/vocab-dcat-2/>

```
<dcat:dataset>
  <dcat:Dataset>
    < dct:identifier>e0940d27-0059-4156-85e7-ef6b3cb57230</dct:identifier>
    < dct:title>Trees (demo)</dct:title>
    < dct:description>Trees around the botanical garden in Montpellier.
Source: OpenStreetMap</dct:description>
    < dct:language>en</dct:language>
    < dct:license>Open Data Commons Open Database License</dct:license>
    < dct:rights>Open</dct:rights>
    < dct:accrualPeriodicity>Yearly</dct:accrualPeriodicity>
    < dct:spatial>{"type":"Polygon", "coordinates":[]}</dct:spatial>
    < dct:created rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2021-09-28T08:55:44.606067</dct:created>
    < dct:issued rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2021-09-28T08:55:44.606067</dct:issued>
    < dct:modified rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2021-09-28T08:55:44.606067</dct:modified>
    < dcat:contactPoint>
      < vcard:Organization>
        < vcard:fn>Jane Doe - ACME (SIG)</vcard:fn>
        < vcard:hasEmail rdf:resource="jane.doe@acme.corp">jane.doe@acme.corp</vcard:hasEmail>
      </vcard:Organization>
    </dcat:contactPoint>
```

# PgMetadata advanced features



# Advanced features

- Easily change the **templates** for the HTML content (visible in the panel): they are stored inside the `html_template` table
- Generate a dataset **HTML card** with **SQL**

```
SELECT pgmetadata.get_dataset_item_html_content('demo', 'trees', 'fr');
```

- Generate a **DCAT representation** with SQL for one or many tables

```
SELECT *  
FROM pgmetadata.get_datasets_as_dcat_xml('fr')  
WHERE True
```

- **Deploy easily in you organisation** with QGIS configuration file variables (hide admin tools, auto-activate plugin)

```
[pgmetadata]  
auto_open_dock=true  
end_user_only=true  
connection_names=Connection 1;Connection 2;Connection 3
```

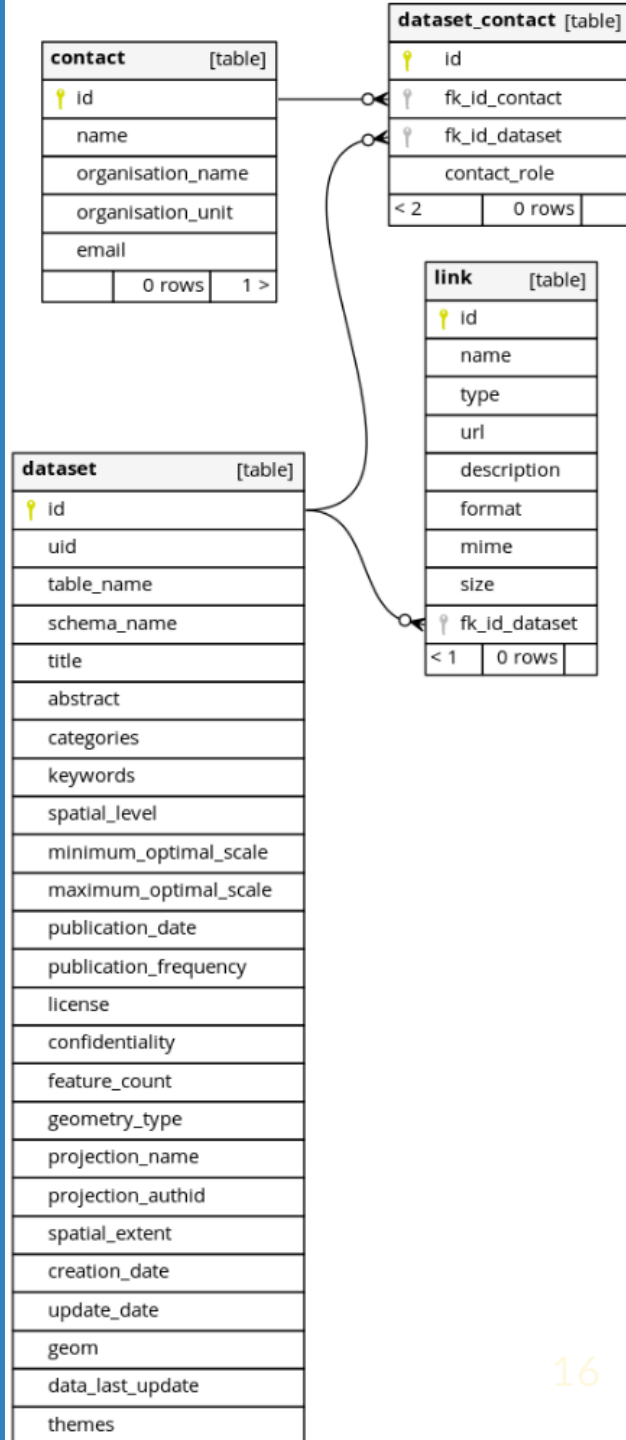
```
[Plugins]  
pg_metadata=true
```

# SQL "centric"

Most of the logic is done in the database **it self**.

Except for the initial schema installation, the Python plugin is not *"strictly"* necessary.

It's **mainly** 4 tables. Then it's a set of SQL functions and triggers.





# Share

(web) Applications can use the **SQL functions** to show the localized metadata in **HTML format** or **publish the full catalog** in **DCAT** (and be harvested by Third party Metadata portals).

Example of **Lizmap Web Client PgMetadata module**:

<https://github.com/3liz/lizmap-pgmetadata-module/>

*Lizmap Web Client conference tomorrow at 02:00 PM 🙏*



The screenshot displays the Lizmap Web Client interface. The top header shows 'GARD 3.0 Département' and 'Données ouvertes Données de référence'. A search bar and 'Connect' button are on the right. The left sidebar contains a 'Layers' panel with a 'Close' button and a 'Legend' panel. The 'Layers' panel lists various administrative and social development layers, including 'Mairies', 'Communes', 'Cantons électoraux', 'EPCI', 'PETR', 'Pays', 'SCOT', 'Circonscriptions législatives', 'Sites du département', 'Développement social', 'Etablissements pers. handicapés adultes', and 'Etablissements pers. âgées'. The 'Communes' layer is selected. The main map area shows a satellite view of Gard, France, with numerous pink icons representing daycares. The right panel displays the metadata for the selected layer, 'Les crèches gardoises'. The metadata includes a title, a detailed description, categories, themes, and keywords.

GARD 3.0 Département	
Département du Gard S.I.G 3.0	
► Identification	
Titre	Les crèches gardoises
Résumé	Localisation des crèches à l'adresse à partir d'un fichier transmis par la direction petite enfance - Reste une incertitude sur certaines localisation à préciser_ rajout en 2013 d'un ID carto commun afin de faciliter les mises à jour
Catégories	
Thèmes	Administration et action publique, Social, santé et sports
Mots clés	gard, social;équipement



# Documentation

<https://docs.3liz.org/qgis-pgmetadata-plugin/>

- For the **administrator**
- For the **end user**
- For the **system administrator**
- **Ressources**: Changelogs, videos, road map, database structure, etc.

The screenshot displays the PgMetadata documentation website. The top navigation bar is green with the PgMetadata logo and a search bar. Below the navigation bar, the 'User guide' section is highlighted in the left sidebar. The main content area shows the 'User guide' title and a list of sections: Index, End user, GIS admin, Sys admin, and Advanced. The 'End user' section is selected, showing a list of topics: a quick start guide, for end users, and for GIS administrator.

**PgMetadata** Search

docs.3liz.org Home User guide Lizmap Processing References Changelog Contributing Roadmap Database

**User guide**

Index  
End user  
GIS admin  
Sys admin  
Advanced  
Video tutorials

**User guide**

This user guide has been split into 4 sections mainly :

- a **quick start** guide showing how to install and use PgMetadata
- for **end users**, such as GIS technician who are not editing metadata or managing the PostGIS database
- for **GIS administrator** who are maintaining the PostGIS database, creating new metadata


# Conclusion



# Why another metadata tool ?

Many open-source tools already exist to store and share metadata.

Why **PgMetadata** ?

- See the previous slide about **PostgreSQL** 
- Keep the metadata **as close as possible to the data**
- Not a new application, but a set of tools for **QGIS** and your **existing PostgreSQL database**:
  - the GIS administrator already uses PostgreSQL and can understand easily how PgMetadata works,
  - the GIS users do not need to learn to use a new application
- **GIS user oriented**: as a user, search & get the metadata **from QGIS** *VERSUS* browse a web page and download the data
- It is **NOT designed to replace the existing metadata web portals**, but to be used as a **complementary** tool !



## Road map

We released a new version in last week, September 2024, mainly a maintenance version.

But earlier this year, some contributions from **@effjot Florian Jenn** and **@mixedbredie Ross McDonald**. They contributed adding more terms about INSPIRE and UK Open Government Licence.

Other ideas:

- Use the **QGIS native** "metadata panel", the SQL schema has been designed according to QGIS internal metadata schema.
- **Auto-fill** the dataset table from a selection of PostgreSQL tables/views
- **Import/Export** the QGIS native layer metadata properties
- Import metadata from **DCAT**



# Resources

- Documentation: <https://docs.3liz.org/qgis-pgmetadata-plugin/>
- Database structure: <https://docs.3liz.org/qgis-pgmetadata-plugin/database/>
- Source code: <https://github.com/3liz/qgis-pgmetadata-plugin/>
- Translations: <https://www.transifex.com/3liz-1/pgmetadata/>
- Twitter: [@3liz\\_news](https://twitter.com/3liz_news)
- Email: [info@3liz.com](mailto:info@3liz.com)



# Thanks



Thanks to the French **Gard province** for funding the first version of this extension !

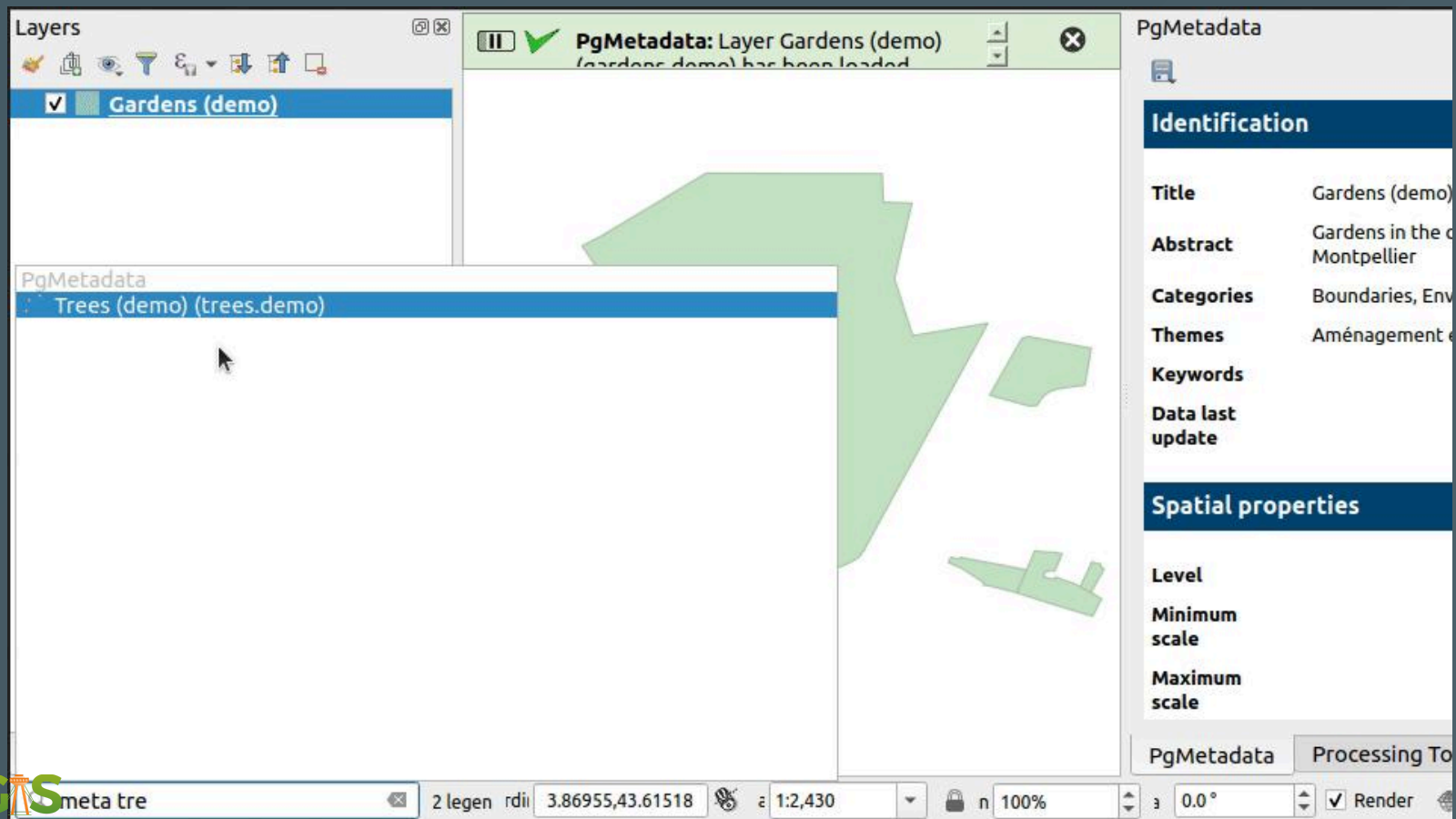
Many thanks to our external active **contributors**:

- **Florian Jenn** [@effjot](#) for ideas, fixes & improvements
- Our kind translators in Transifex for
  - **Finnish** (Santtu Majuri @BinkiBai, Santtu Pyykkönen @santtuvp),
  - **German** (Florian Jenn @effjot)
  - **Spanish** (Carlos López Quintanilla @carlos.psig)

# Thank you for your attention

Questions ?

I would love to hear feedback from any PgMetadata user !



The screenshot displays the PgMetadata web application. The main map area shows a green polygon representing a garden. The Layers panel on the left lists 'Gardens (demo)' and 'Trees (demo) (trees.demo)'. The right-hand sidebar provides metadata for the selected layer, including Identification, Spatial properties, and other details.

Identification	
Title	Gardens (demo)
Abstract	Gardens in the c Montpellier
Categories	Boundaries, Env
Themes	Aménagement e
Keywords	
Data last update	

Spatial properties	
Level	
Minimum scale	
Maximum scale	

The bottom status bar shows the map's extent (3.86955, 43.61518), scale (1:2,430), and other technical details.

