

Open Data Access and Harmonisation by Virtual Hub - ENERGIC OD solutions

OnoM@p / NoiseCapture european application

INSPIRE Conference 2017

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- Introduction to Noise pollution
- General overview
- Noise-Planet initiative
- OnoMap SDI
- NoiseCapture app
- Virtual Hub
- Conclusion



(Effect of) Noise in Europe



“Excessive noise seriously harms human health and interferes with people’s daily activities at school, at work, at home and during leisure time. It can disturb sleep, cause cardiovascular and psychophysiological effects, reduce performance and provoke annoyance responses and changes in social behaviour.”

European Environmental Noise directive 2002/49/EC

“define a common approach intended to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to the exposure to environmental noise”

Noise mapping

- To identify noise pollution
- To propose action plans to reduce noise
- To communicate with citizens



Methods

- **Modelling** of noise emission and propagation (NMPB, CNOSSOS, ISO 9613...)
- **Measuring** real noise in urban areas (noise observatories): need a large amount of “qualified” data.

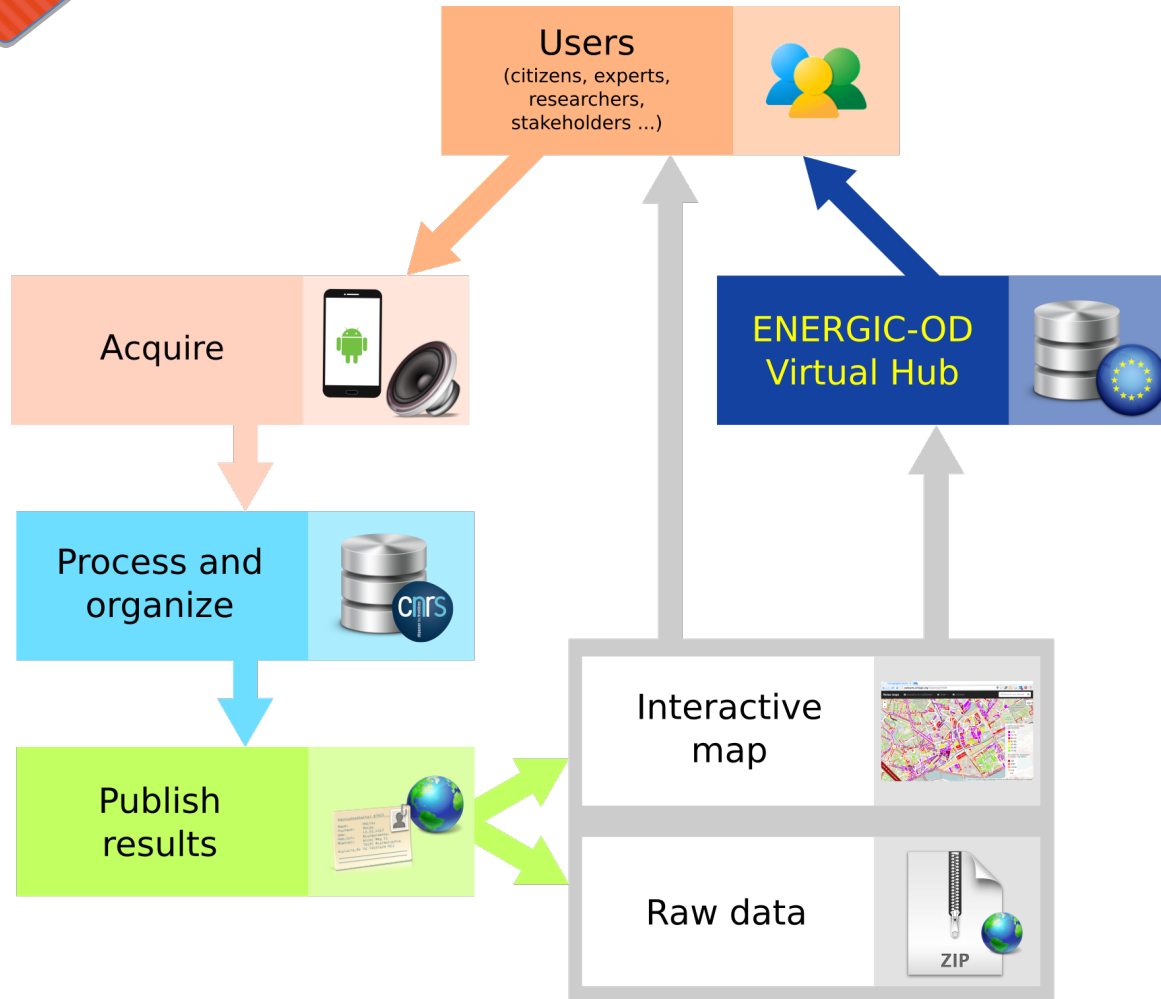
Alternative approach



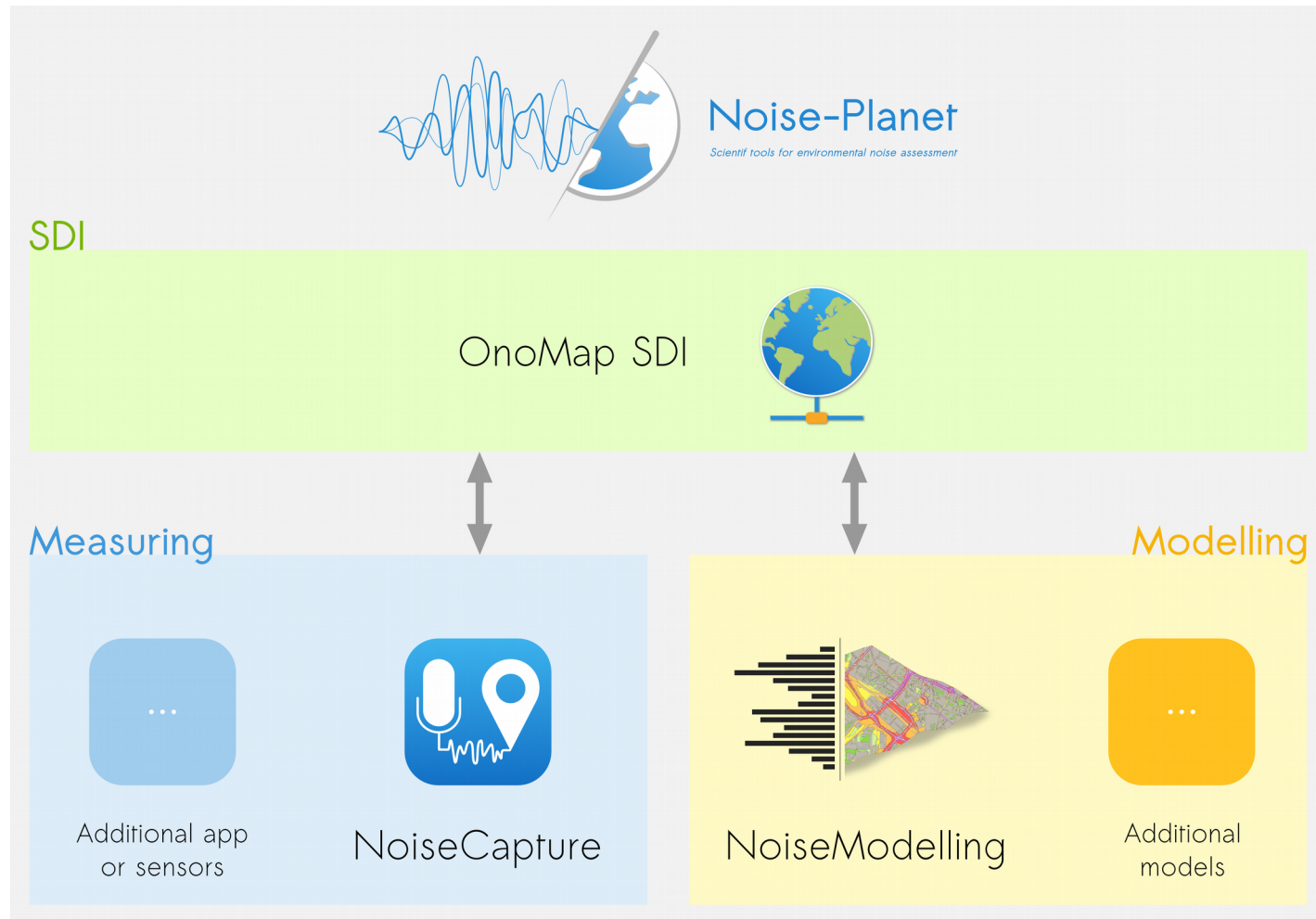
Develop a participative approach based on collaborative noise maps using smartphones (i.e. citizens) for a massive acquisition of noise data in urban environment.

→ G. Guillaume et al, « Noise mapping based on participative measurements ». Noise Mapping 3, no 1 (2016): 140-156. doi:10.1515/noise-2016-0011.

- Made by specialists in Geomatics and in Acoustics
- Following VGI and open/participative science concepts
- Citizen both producer and consumer of data
- Build a qualified noise database
- Produce “real” and relevant noise maps
- Share database and noise maps with communities



<http://noise-planet.org/>



A Spatial Data Infrastructure to :

- **Collect** data coming from acquisition (NoiseCapture, ...) and modelisation (NoiseModeling, ...) modules,
- **Organize** data in a single place
- **Describe** data in a common way
- **Publish & share**, to encourage data reuse

Based on (open) standards (ISO 19115, WMS, WFS, WPS, SFS-SQL, ...) and compliant with the european INSPIRE Directive



Metadata catalog



- Describe
- Organize
- Search

CSW

Spatial database



- Store
- Manage
- Query

SFS SQL

Processing



- Process data remotely

WPS / Groovy

ENERGIC-OD
Virtual Hub



Cartographic server



- Connect
- Style
- Transform
- Share

WMS / WFS

WebCarto library



- Display in an interactive way

HTML 5 / Javascript

Server side

OnoMap SDI (tools)

European Network for Redistributing Geospatial Information to user Communities - Open Data

OnoMap SDI



Metadata catalog



CSW

Spatial database



SFS SQL

Processing



WPS / Groovy

ENERGIC-OD
Virtual Hub



Cartographic server



WMS / WFS

WebCarto library



HTML 5 / Javascript

Server side

- Official release V1.0
- Android app (*at least 4.3*)
- Free (*... and no Adds*)
- Open-source (*GPLv3*)
- For any kind of users (citizens, professionals, ...)
- Need to calibrate the smartphone
- No background measure. Users decide when it starts and it ends



Privacy policy

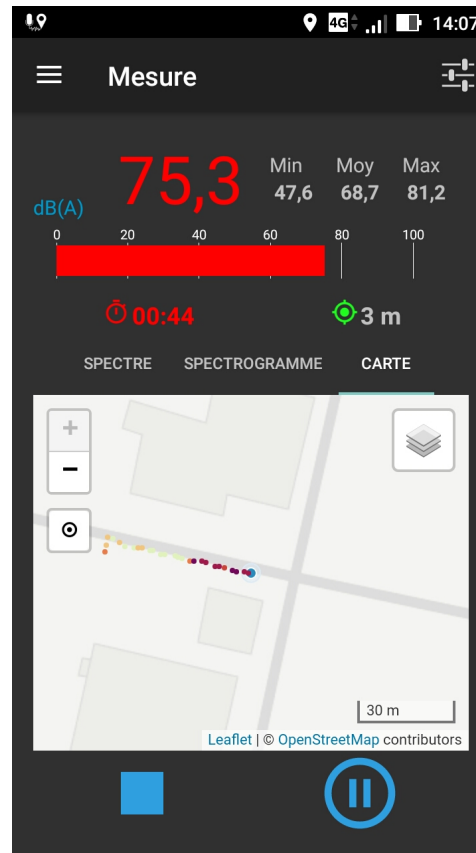
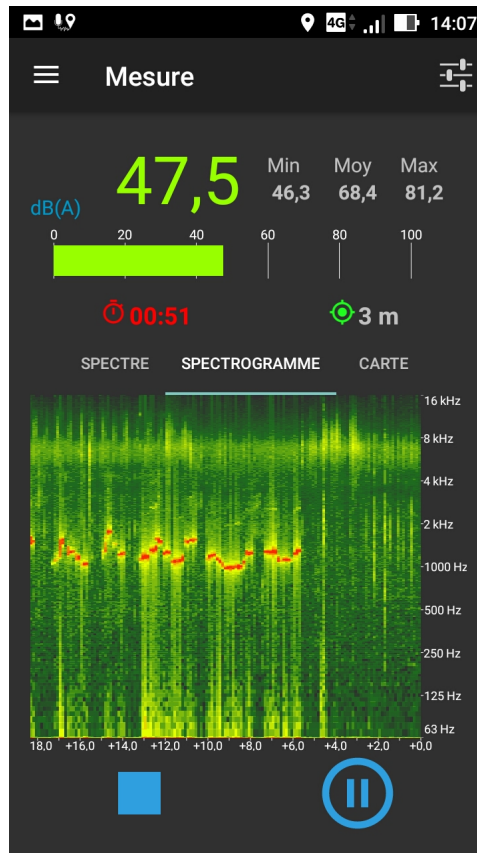
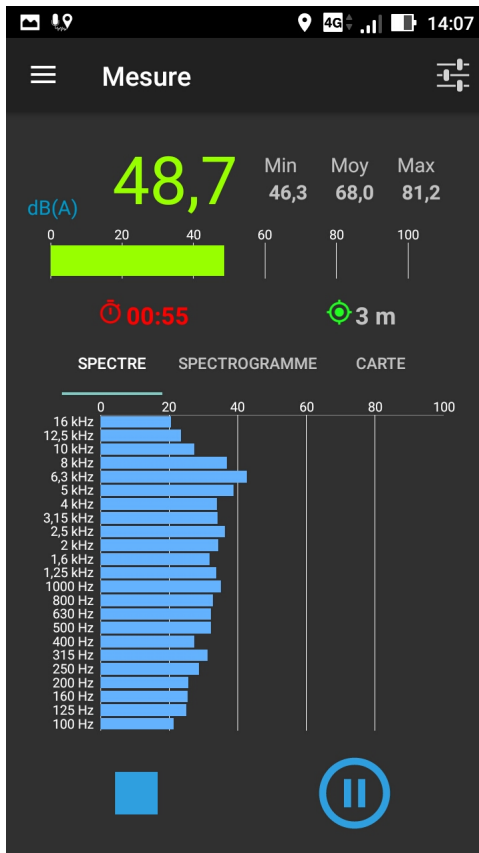
- No need to register
- Anonymised data. Only basic informations are collected :
 - Unique User ID (UUID) to link noise measures and a smartphone
 - Smartphone informations (OS version, Model)
- No audio recording → not possible to understand a conversation, ...

Read the full privacy policy :

http://noise-planet.org/NoiseCapture_privacy_policy.html



Measurement



- 3 possibilities :
- Spectre
 - Spectrogramme
 - Map

Description : Once the measure is done, users are invited (optionnaly) to add description

Text description →



Insérer une description ici

Désagréable Agréable

Conditions de mesures

TEST	INTERIEUR	PLUIE	VENT
------	-----------	-------	------

Sources prédominantes

VOIX	T. ROUTIER	EAU	TRAVAUX
ENFANTS	T. FERRÉ	ANIMAUX	ALARMES
PAS	T. AÉRIEN	VÉGÉTATION	INDUSTRIEL
MUSIQUE	T. MARITIME		

EFFACER VALIDER

← Take a photo (private information)

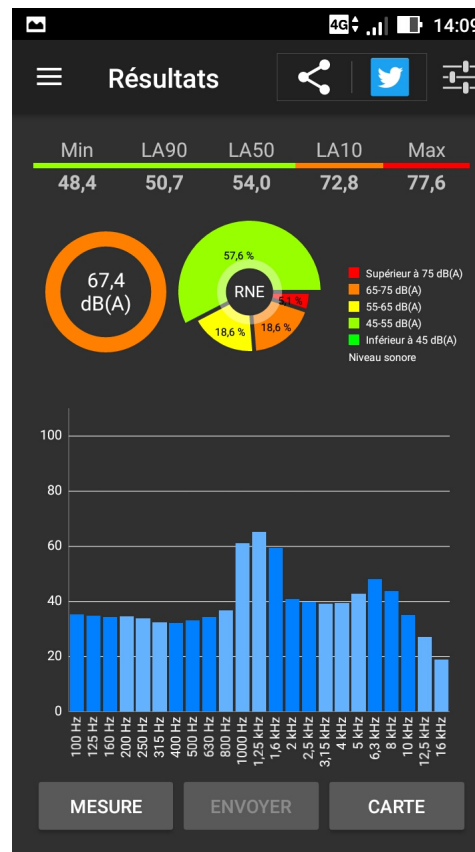
← Pleasantness

← Tag to qualify measure conditions

← Tag to qualify measure sources

Indicators : Consult indicators related to your measure

Mean db during the measure



Noise classes repartition during the measure



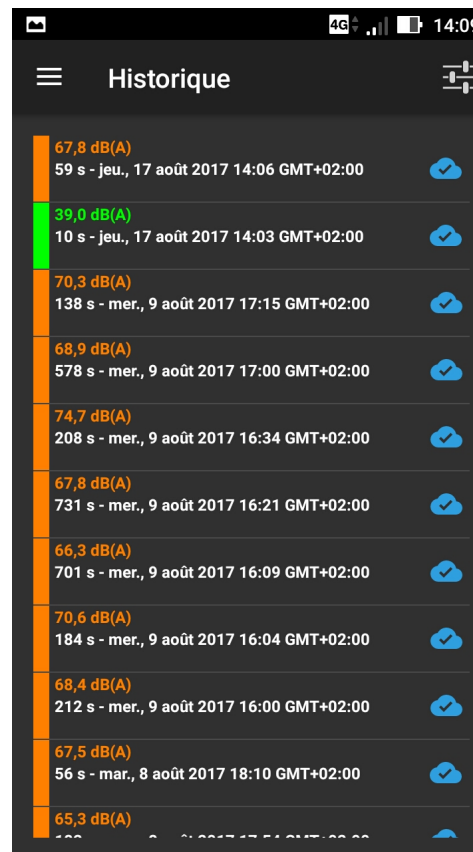
Frequencies histogram



Visualization : Visualize on the map the selected measure, all your past contributions and the community map



History : Consult and manage your measures



dB(A)	Duration	Date	Time	GMT+02:00	Upload Status
67,8	59 s	17 août 2017	14:06		Uploaded
39,0	10 s	17 août 2017	14:03		Uploaded
70,3	138 s	9 août 2017	17:15		Uploaded
68,9	578 s	9 août 2017	17:00		Uploaded
74,7	208 s	9 août 2017	16:34		Uploaded
67,8	731 s	9 août 2017	16:21		Uploaded
66,3	701 s	9 août 2017	16:09		Uploaded
70,6	184 s	9 août 2017	16:04		Uploaded
68,4	212 s	9 août 2017	16:00		Uploaded
67,5	56 s	8 août 2017	18:10		Uploaded
65,3					Uploaded

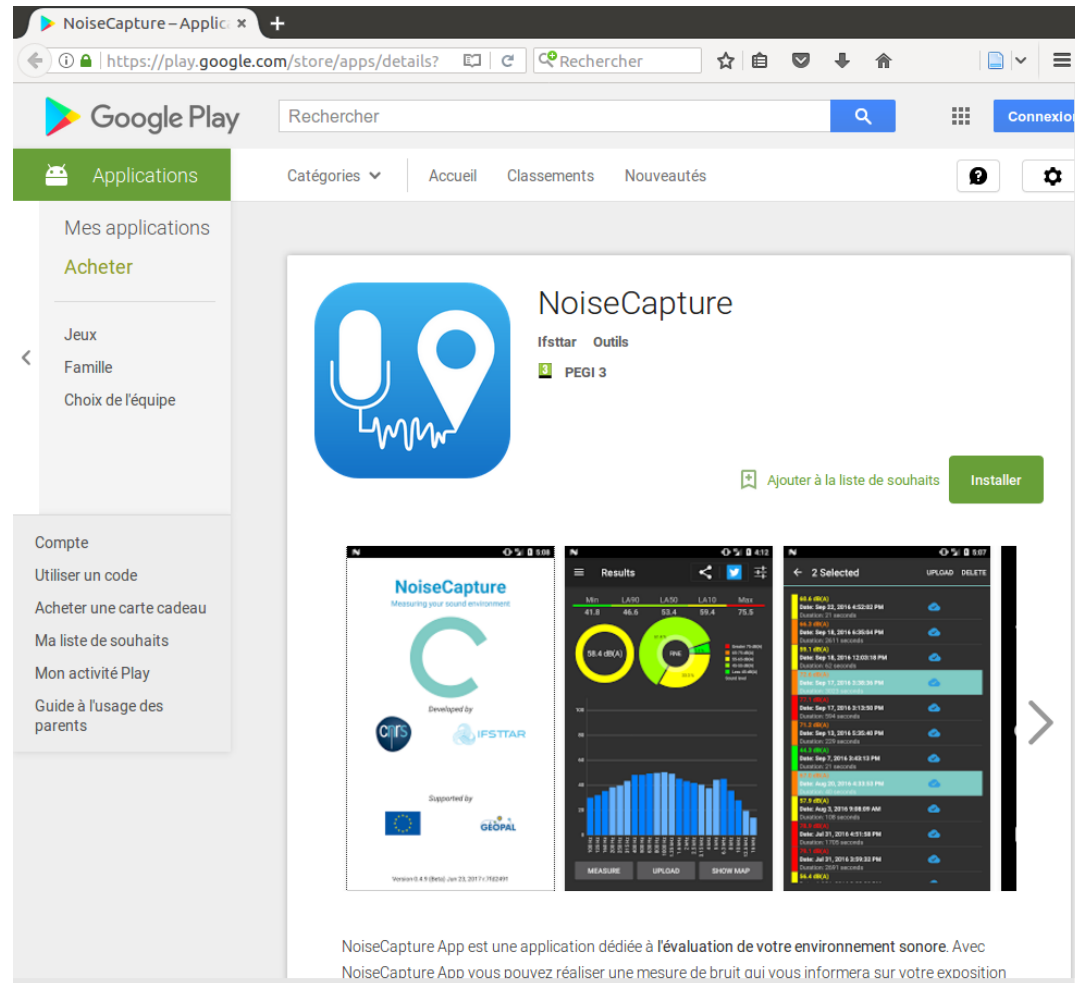
← Icon to indicates if the measure has been uploaded to our server

1. Install NoiseCapture (thanks to Google Play or QR Code)



2. Activate your GPS

3. Launch the app and start measuring noise



NoiseCapture App est une application dédiée à l'évaluation de votre environnement sonore. Avec NoiseCapture App vous pouvez réaliser une mesure de bruit qui vous informera sur votre exposition

- A ready-to-go protocol / tutorial
- Already available in French, English and Italian

→ http://noise-planet.org/noisecapture_protocol.html



"NoiseCapture" e il protocollo di misura

NoiseCapture è un'app sviluppata nell'ambito del progetto di ricerca europeo **ENERGIC-OD**, dal Laboratorio di ricerca sull'Acustica Ambientale di Ifsttar e dal team **DECIDE** del Lab-STICC (CNRS 6285).

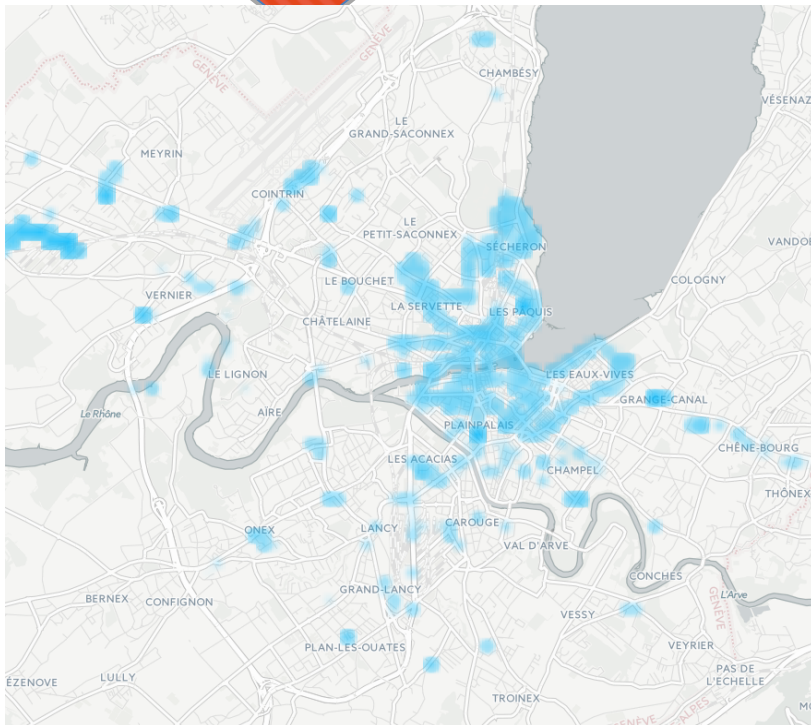
L'obiettivo del progetto è la **rappresentazione cartografica degli ambienti sonori, per mezzo di misurazioni collettive**. A tale scopo, i partecipanti hanno a disposizione **NoiseCapture**, un'app per smartphone Android che consente di misurare il livello di rumore circostante.

Le misurazioni fornite dalla comunità di partecipanti sono raccolte in forma anonima e trasformate in informazioni cartografiche consultabili attraverso un'interfaccia web. L'elaborazione dei dati si basa su metodologie di rilevazione acustica, statistica e geografica. Puoi vedere NoiseCapture in azione su questa mappa interattiva.

NoiseCapture: a chi è rivolto?

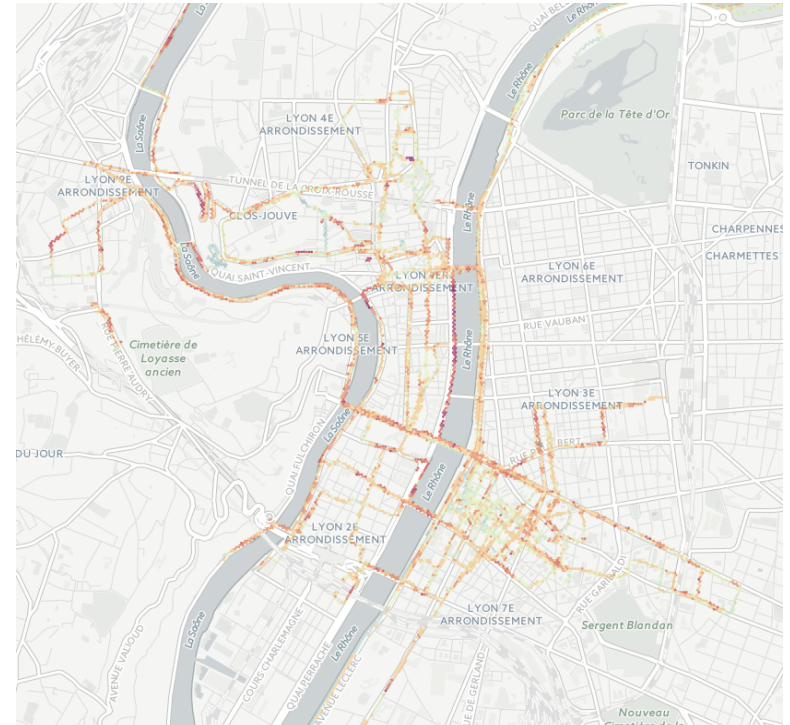
NoiseCapture è un'app rivolta a utenti con un livello di **competenza tecnica sufficiente** per fare misurazioni acustiche a regola d'arte e per guardare ai risultati in modo sufficientemente critico. Gli utenti possono avere profili molto diversi, ma dovrebbero comunque avere una certa sensibilità sul tema del rumore ambientale: ad esempio, fonici, tecnici o ingegneri appartenenti a una comunità o a una società di consulenza, professionisti con formazione tecnica, o persone qualsiasi che abbiano ricevuto una formazione preliminare sull'uso dell'app, ad esempio durante un NoiseCapture Party.

NoiseCapture può rivelarsi interessante anche per un pubblico più ampio, tenendo presente la necessità di



Geneva (CH)

(since February - EPFL project) *



Lyon (FR)

(since May - by <http://www.acoucite.org/>) *

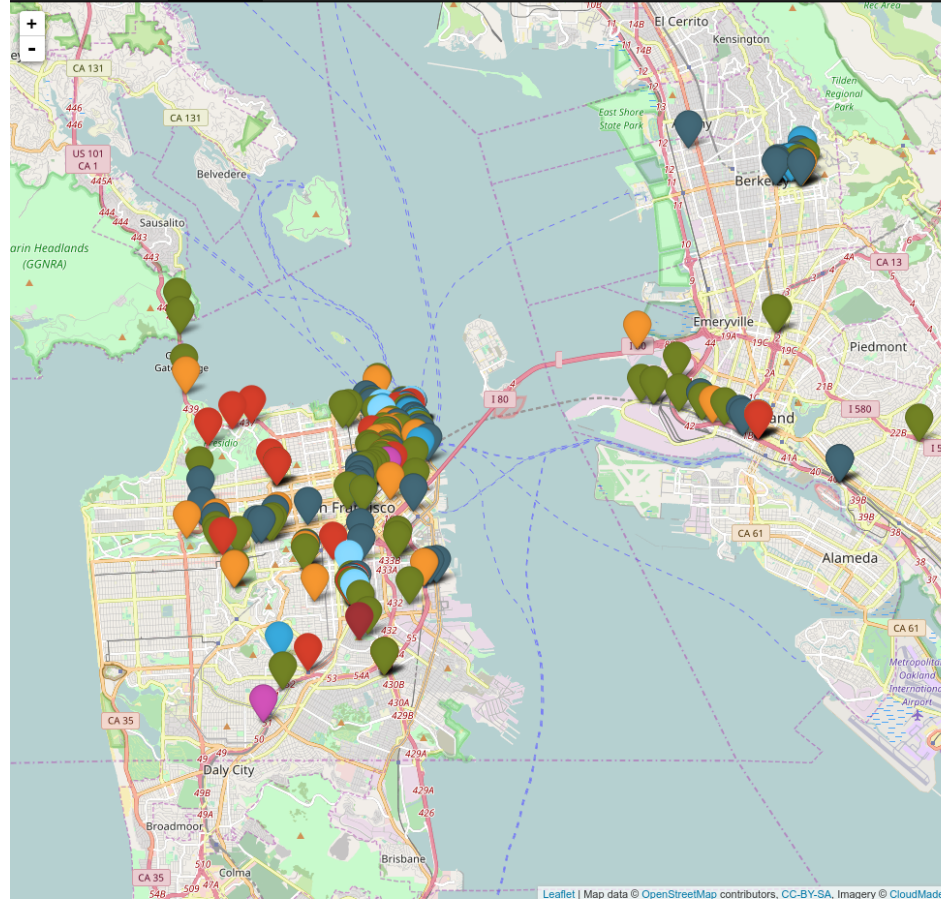
To
come

Firenze (IT) - Lorenzo Bigagli (CNR) project *

St-Nazaire (FR) - Digital Week, september 20th **

Paris (FR) - 8es Assises nationales de la qualité de l'environnement sonore (Nov. 2017) **

* *autonomous initiative*
** *supported by CNRS/IFSTTAR*



Reuse of NoiseCapture

- Researchers from Switzerland (<http://www.unige.ch/>)
- Noisebay app
- San Francisco (USA)
- May 1st to 18th

→ <https://crowd.unige.ch/noiseMapSF>

Noise level map of the Bay Area - created by smartphones.

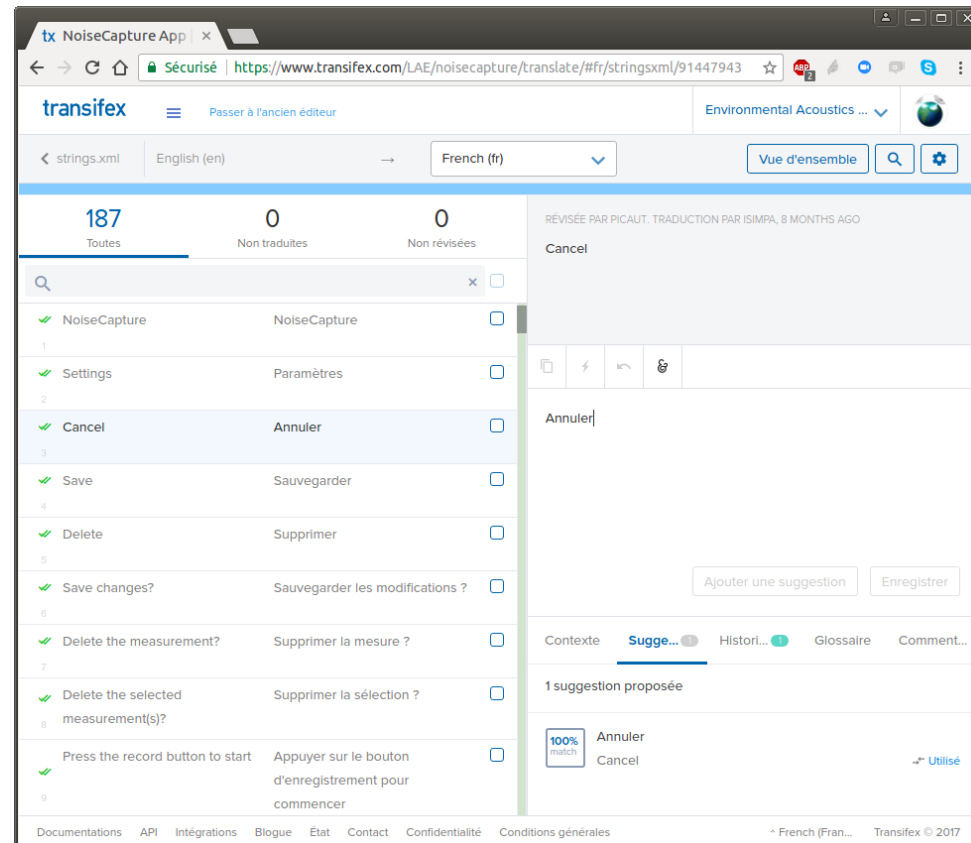
Translation with the Transifex platform:
<https://www.transifex.com/LAE/noisecapture/>

- Create a free account & start translate
- 187 character chains (*words or small sentences*)
- Can be done in half a day

Done →



Next ? →

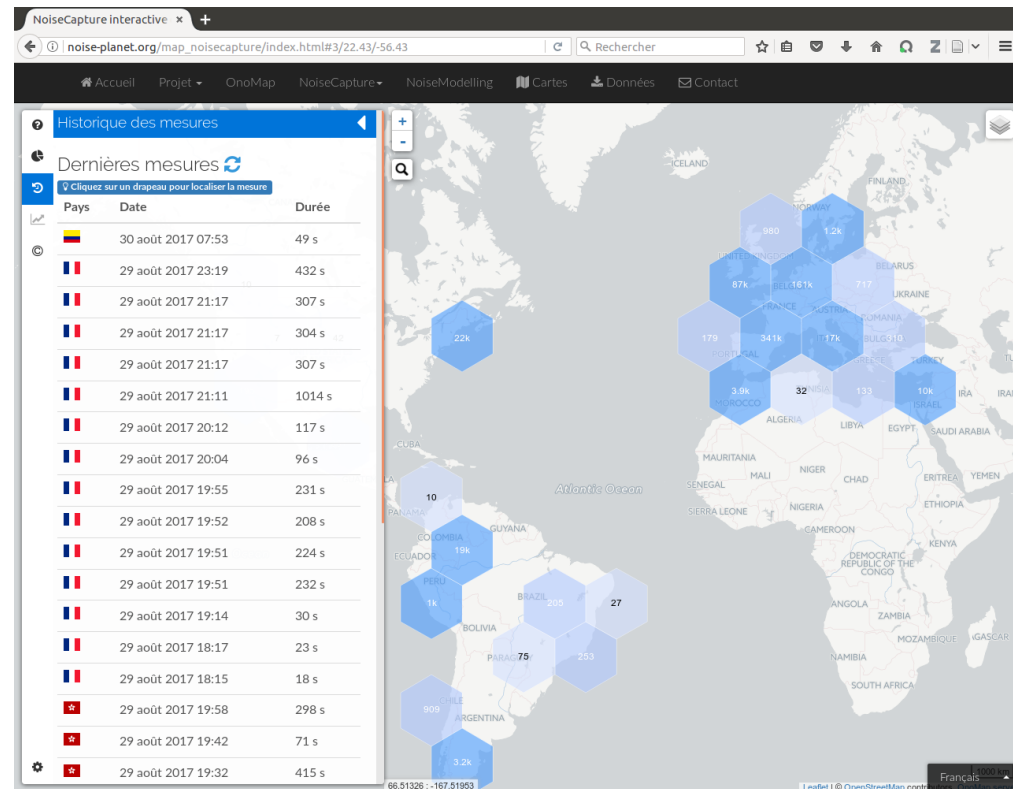
The screenshot shows the Transifex web interface for translating the NoiseCapture application. The browser address bar shows the URL: <https://www.transifex.com/LAE/noisecapture/translate/#fr/stringsxml/91447943>. The interface is in French and shows a list of 187 translation items. The current item is 'Cancel', which has been translated to 'Annuler'. The interface includes a search bar, a list of items with checkboxes, and a right-hand panel for editing the translation. The bottom of the page shows navigation links like 'Documentations', 'API', 'Intégrations', 'Blogue', 'Etat', 'Contact', 'Confidentialité', and 'Conditions générales'.

- Measures from NoiseCapture uploaded in quasi-realtime ($\pm 1mn$) and displayed in the interactive map:
<http://noise-planet.org/map.html>

- Mainly in Europe, but also coming from the all world.

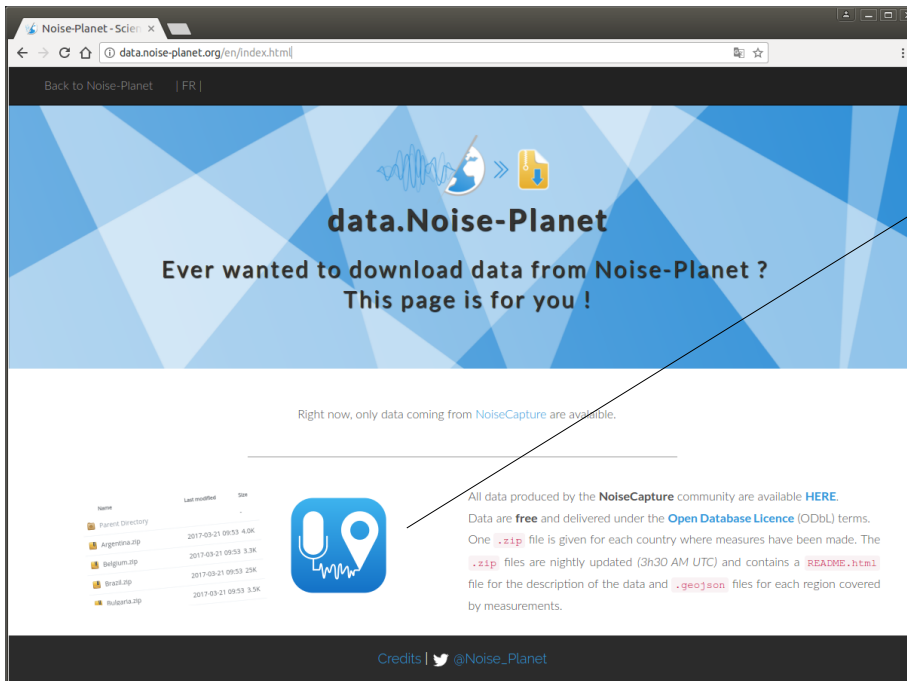
- 3 WMS (& WFS) layers
 - Sound levels
 - Density of measures (blue)
 - Location of measures

→ URLs can be found [here](#)



... and already visible in the pEU VH

- One entry point: data.noise-planet.org
- Under **ODbL** licence
- Measures in 49 countries (2017, Sept. 3rd)
- 1 zip file per country (3 geojson files per regions)



NoiseCapture

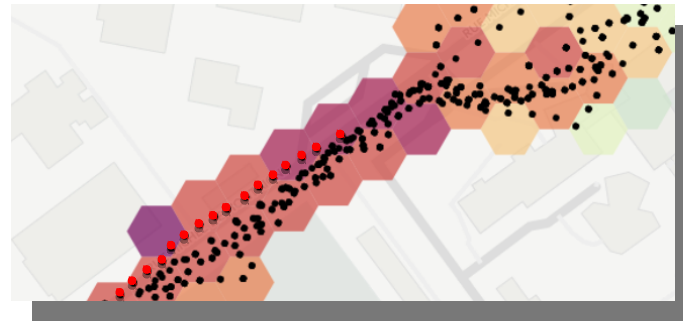
Name	Last modified	Size
Parent Directory	-	-
Algeria.zip	2017-06-09 04:45:3.6K	
Argentina.zip	2017-06-09 04:45:4.0K	
Azerbaijan.zip	2017-06-09 04:45:3.3K	
Belgium.zip	2017-06-09 04:45:346K	
Brazil.zip	2017-06-09 04:45:30K	
Bulgaria.zip	2017-06-09 04:45:9.5K	
Canada.zip	2017-06-09 04:45:16K	
Chile.zip	2017-06-09 04:45:42K	
Colombia.zip	2017-06-09 04:45:530K	
France.zip	2017-06-09 04:45:14M	
French Polynesia.zip	2017-06-09 04:45:2.9K	
Germany.zip	2017-06-09 04:45:208K	
Greece.zip	2017-06-09 04:45:12K	
India.zip	2017-06-09 04:45:8.3K	
Indonesia.zip	2017-06-09 04:45:5.2K	
Israel.zip	2017-06-09 04:45:359K	
Italy.zip	2017-06-09 04:45:507K	

Lithuania.zip	2017-06-09 04:45:2.6K
Luxembourg.zip	2017-06-09 04:45:403K
Malaysia.zip	2017-06-09 04:45:3.8K
Mexico.zip	2017-06-09 04:45:11K
Morocco.zip	2017-06-09 04:45:6.6K
Netherlands.zip	2017-06-09 04:45:563K
Northern Cyprus.zip	2017-06-09 04:45:5.7K
Norway.zip	2017-06-09 04:45:23K
Palestina.zip	2017-06-09 04:45:18K
Peru.zip	2017-06-09 04:45:15K
Portugal.zip	2017-06-09 04:45:143K
Reunion.zip	2017-06-09 04:45:33K
Slovakia.zip	2017-06-09 04:45:2.8K
Spain.zip	2017-06-09 04:45:64K
Sweden.zip	2017-06-09 04:45:31K
Switzerland.zip	2017-06-09 04:45:4.9M
Thailand.zip	2017-06-09 04:45:410K
Tunisia.zip	2017-06-09 04:45:13K
United Kingdom.zip	2017-06-09 04:45:220K
United States.zip	2017-06-09 04:45:9.8K
Vietnam.zip	2017-06-09 04:45:4.8K

3 GeoJSON files

```
{
  "type": "Feature",
  "geometry": {
    "type": "Point",
    "coordinates": [125.6, 10.1]
  },
  "properties": {
    "name": "Dinagat Islands"
  }
}
```

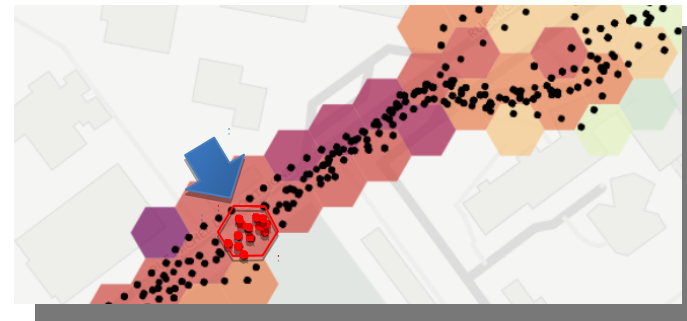
*.tracks.geojson

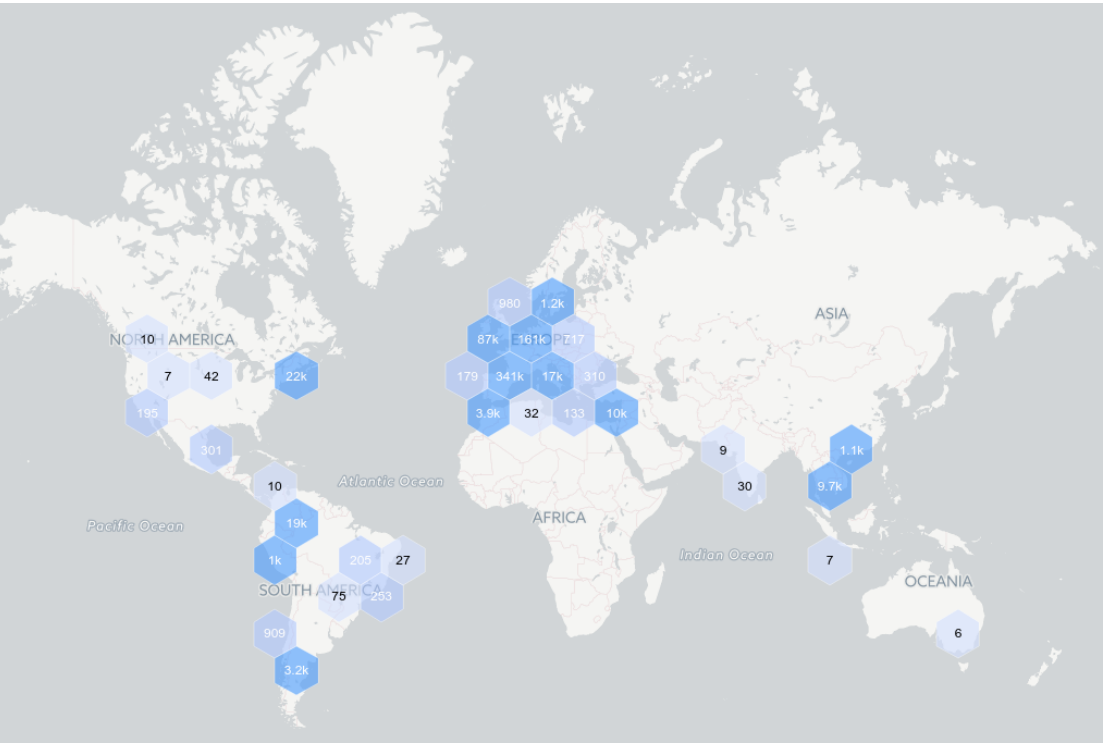


*.points.geojson



*.areas.geojson





Some stats (2017 Sept 3rd)

- 1 003 users (*at least 1 measure*)
- 1 000 730 points of measures
- 5 131 tracks
- Average track time: 195s
- Average track length : 486m
- Active installations : 941
- Installation per countries :

France : 781

Switzerland : 382

Italy : 55

Colombia: 48

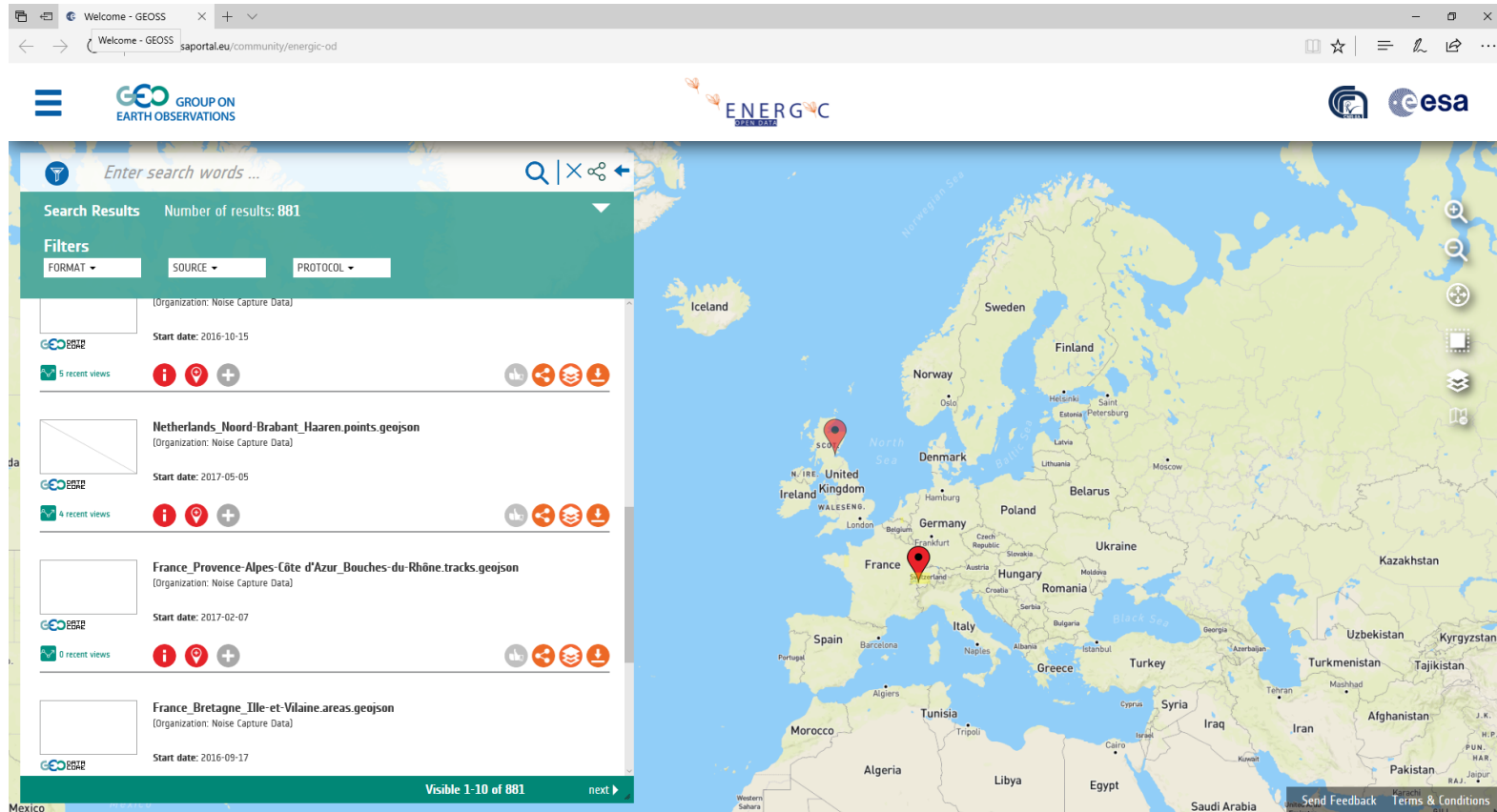
India : 47

USA : 33

...

Connection between the VH and NoiseCapture/Onomap data

→ 881
resources
collected



The screenshot shows a web browser window displaying the ENERGIc-OD portal. The search bar contains the text "Enter search words ...". Below the search bar, the search results are displayed, showing a total of 881 results. The results are filtered by "FORMAT", "SOURCE", and "PROTOCOL". The first four results are listed:

- [Organization: Noise Capture Data]
Start date: 2016-10-15
5 recent views
- Netherlands_Noord-Brabant_Haaren.points.geojson
(Organization: Noise Capture Data)
Start date: 2017-05-05
4 recent views
- France_Provence-Alpes-Côte d'Azur_Bouches-du-Rhône.tracks.geojson
(Organization: Noise Capture Data)
Start date: 2017-02-07
0 recent views
- France_Bretagne_Ile-et-Vilaine.areas.geojson
(Organization: Noise Capture Data)
Start date: 2016-09-17

The background of the page features a map of Europe with red location pins over the Netherlands and France. The bottom of the page shows "Visible 1-10 of 881" and a "next" button.



Main features

- A comprehensive and open infrastructure for producing noise data from smartphones, with a special attention to the audio-processing,
- A raw database for the need of the scientific community in order to produce a relevant evaluation of noise in the environment,
- All data accessible through the pEU VH



Future developments

- Improve the calibration and audio processes,
- Methodologies for Data Quality Assessment,
- Production of noise maps,
- Use data coming from pEU VH to improve noise maps
- Translate the application in other languages
- NoiseCapture for iOS (iPhone).

Thank you for your attention



Download NoiseCapture App on Google Play:

https://play.google.com/store/apps/details?id=org.noise_planet.noisecapture

Visualize community noise maps: <http://noise-planet.org/map.html>

Follow the development of NoiseCapture on GitHub platform:

<https://github.com/lfsttar/NoiseCapture>



@Noise_planet

Made by ...

... and partially funded by

