

Webinar on Citizen Science for Environmental Monitoring in the UK

July 21st 2020

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Founded by the Horizon
2020 programme of the
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Grant Agreement No
789315



What comes to your mind when you think about Citizen Science?



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bottom-up
participation
engagement
data



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AGENDA

1. Environmental monitoring
2. What is citizen science
3. How is citizen science being used to monitor air quality, noise and odour
4. How could this be incorporated in your council
5. Tools available for environmental monitoring (OdourCollect, Community Maps)

A hand is pointing to a map of an urban area. The map features several colored circular markers: red, green, and blue. The markers are placed on various streets and buildings. The map is overlaid with a semi-transparent dark grey layer. The text 'Environmental monitoring' is written in large white font across the center of the map.

Environmental monitoring

**What's the current
procedure for
environmental monitoring
applied in your
council/area?**

Citizen science



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xAire, Barcelona

What is Citizen Science?

Engaging non professional scientists in producing new knowledge or understanding



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- Principle 10 of Rio Declaration (1992)
- UN SDGs
- 10 principles of Citizen Science (ECSA, 2015)



**EUROPEAN
CITIZEN SCIENCE
ASSOCIATION**

Ten principles of citizen science



Ten principles of citizen science

Citizen science is a flexible concept which can be adapted and applied within diverse situations and disciplines. The statements below were developed by the 'Sharing best practice and building capacity' working group of the European Citizen Science Association led by the Natural History Museum London with input from many members of the Association. To set out some of the key principles which as a community we believe underlie good practice in citizen science.

1. Citizen science projects actively involve citizens in scientific endeavour that generates new knowledge or understanding. Citizens may act as contributors, collaborators, or as project leader and have a meaningful role in the project.
2. Citizen science projects have a positive science outcome. For example, providing a research question or informing conservation action, management decisions or environmental policy.
3. Both the professional scientists and the citizen scientists benefit from taking part. Benefits may include the publication of research outputs, learning opportunities, personal enjoyment, social benefits, satisfaction through contributing to scientific outcomes e.g. to address local, national and international issues, and through that, the potential to influence policy.
4. Citizen scientists may, if they wish, participate in multiple stages of the scientific process. This may include developing the research question, designing the method, gathering and analysing data, and communicating the results.
5. Citizen scientists receive feedback from the project. For example, how their data are being used and what the research, policy or societal outcomes are.
6. Citizen science is considered a research approach in any cities, with limitations and biases that should be considered and controlled for. However unlike traditional research approaches, citizen science provides opportunity for greater public engagement and democratisation of science.
7. Citizen science projects' data and other data are made publicly available and where possible, results are published in an open access format. Data sharing may occur during or after the project, unless there are security or privacy concerns that prevent this.
8. Citizen scientists are acknowledged in project results and publications.
9. Citizen science programmes are evaluated for their scientific output, data quality, participant experience and wider societal or policy impact.
10. The leaders of citizen science projects take into consideration legal and ethical issues surrounding copyright, intellectual property, data sharing agreements, confidentiality, attribution, and the environmental impact of any activities.

September 2015, London

Levels of engagement

Collaborative science

EXTREME

Problem definition and data collection

PARTICIPATIVE SCIENCE

Interpreters

DISTRIBUTED INTELLIGENCE

Citizens as “sensors”

CROWDSOURCING

Citizen Science in Environmental monitoring



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Citizen Science in Air Quality monitoring

SPRINGS TOWN COMMUNITY
AIR QUALITY MONITORING
T: 07940 567576



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Air quality monitoring

- High grade static sensors provide real time continuous monitoring but costs limit the scale to deploy
- Low grade sensors have issues in data quality



Science in the City - Barbican



~ 100 directly | ~ 4,500 indirectly



12 months data collection



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Spatial distribution designed to capture variation across perceived ‘hotspots’, pedestrian walkways and elevated locations for both NO₂ (using diffusion tubes) and particulates using a portable aerosol monitor



Air Quality Monitoring

Added 5 years ago

[Add contribution](#)

Categories

Toggle all

- NO² (<40) Below EU Limits
- NO² (40-60) Above EU Limits
- NO² (60-80) 50% Above EU Limits
- NO² (80-100) 100% Above EU Limits
- NO² (100+) 150% Above EU Limits

Contributions

No subset selected ▾

Find contributions

All contributions

My contributions

- Active
- Pending
- Review
- Draft

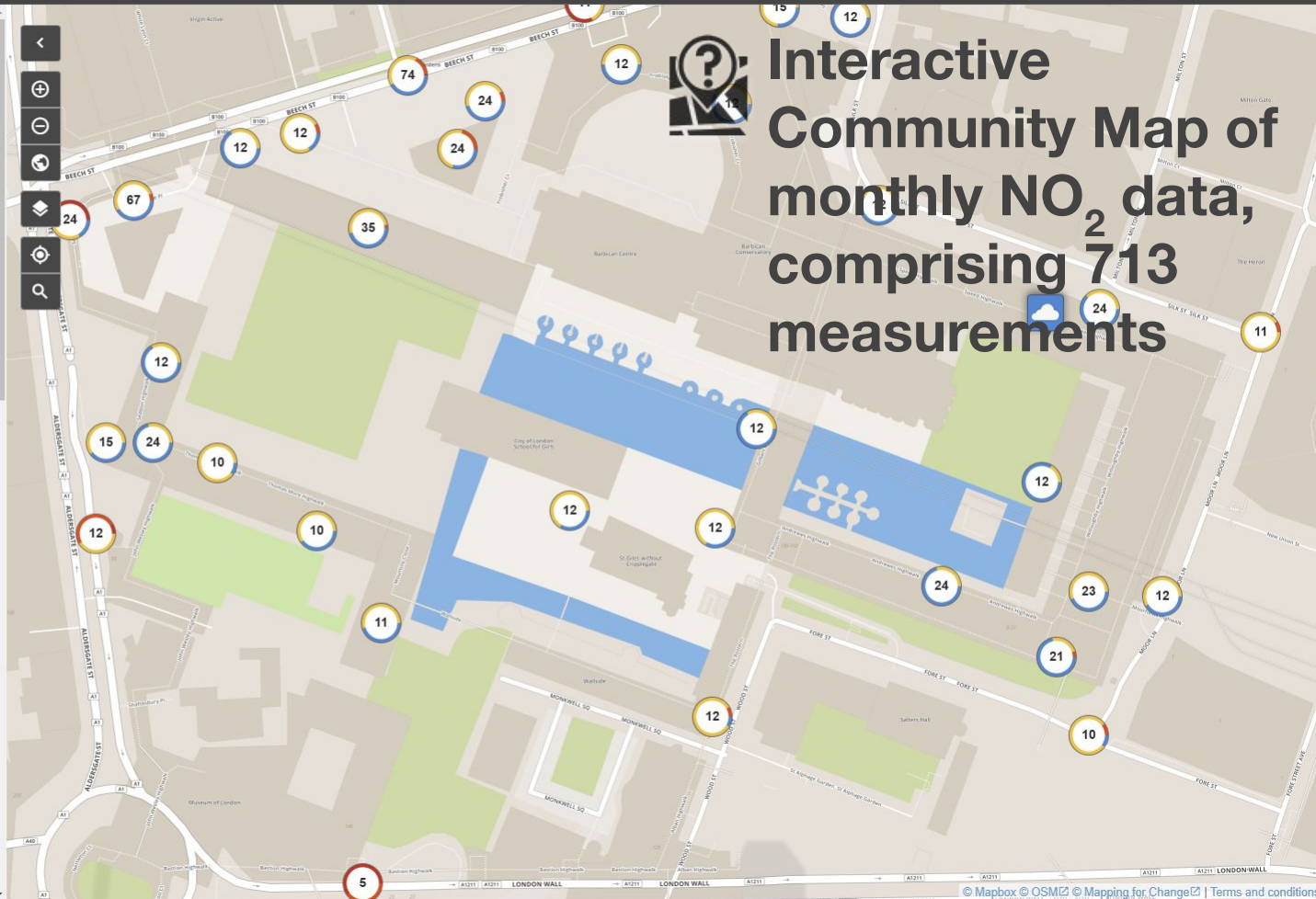
Sort by: **Date updated** ▾

Listing 8 out of 2492

µg/m³
20.79

NO² (<40) Below EU Limits

Garnethill Climate Working Group added 15 days ago | Hannah Stockwell updated 14 days ago

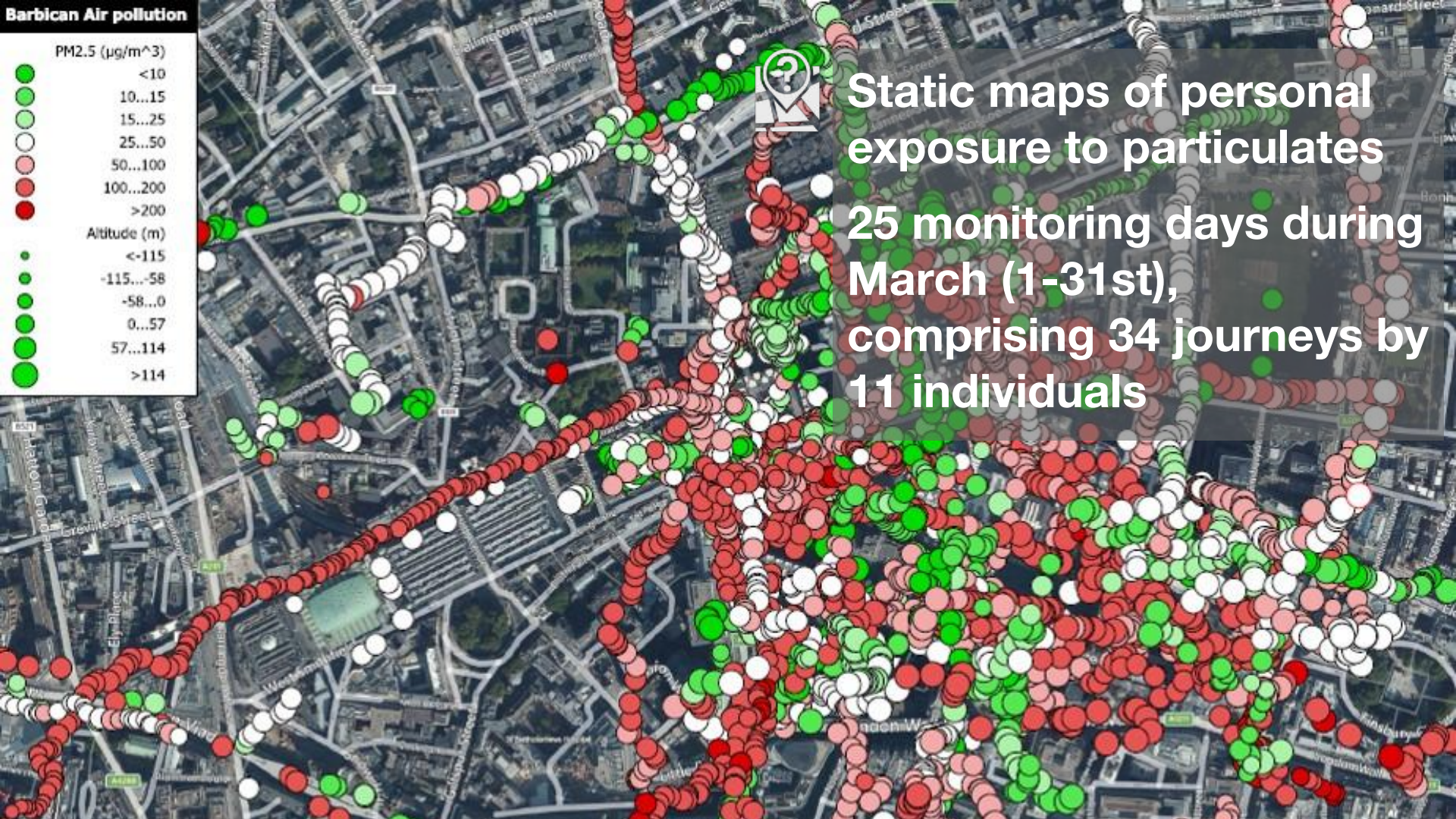


Interactive Community Map of monthly NO₂ data, comprising 713 measurements

Barbican Air pollution



Static maps of personal exposure to particulates
25 monitoring days during March (1-31st),
comprising 34 journeys by 11 individuals



Residents' wish list and outcome

- Traffic restriction and control of polluting vehicles
- Control of emissions from construction sites
- Green infrastructure
- Low Emission Neighbourhood
- The City of London Air Quality Strategy 2015 - 2020.
- Idling engine action days
- Greening the area

Scalability and Replicability



Monitoratge de la qualitat de l'aire a Barcelona | Monitoreo de calidad del aire en Barcelona
Afegit fa 3 anys

Afegir aportació

Categories

Mostra tots

- NO² (<40) sota els límits | debajo de límites UE
- NO² (40-60) per sobre dels límits | por encima de límites UE
- NO² (60-80) 50% per sobre dels límits | por encima de límites UE
- NO² (80-100) 100% per sobre dels límits | por encima de límites UE
- NO² (100+) 150% per sobre dels límits | por encima de límites UE

Aportacions

Trobar aportacions

[Netejar](#)

- Totes les aportacions
- Les meves aportacions

- Actives
- En revisió
- Pendents
- Esborrany

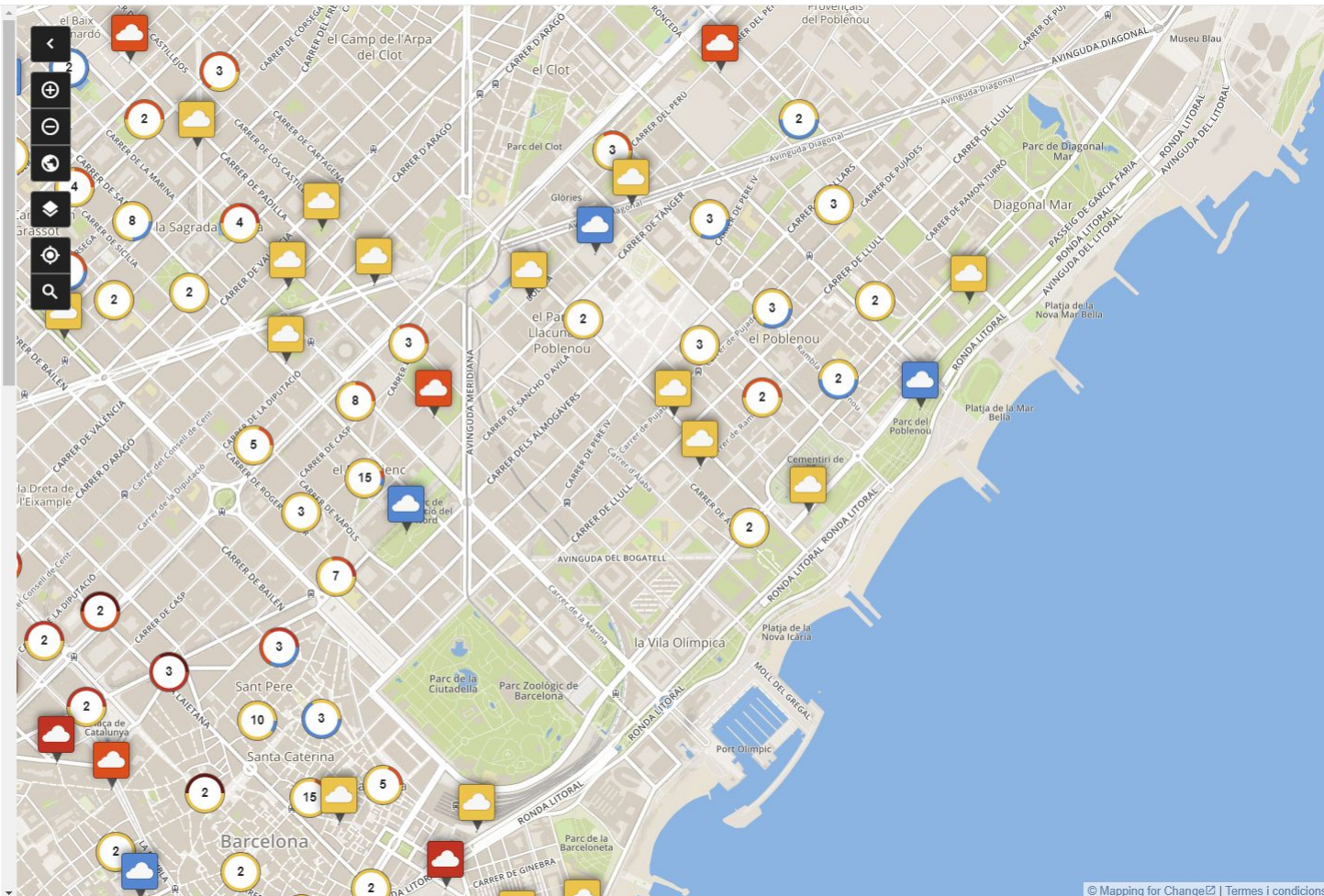
Ordenar per: Data d'actualització -

Llistat 8 de 725

µg/m³ (NO² dada obtinguda | dato obtenido)

102.4291351

NO² (100+) 150% per sobre dels límits | por encima de límites UE



Citizen Science in noise pollution



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Noise pollution monitoring

- High grade static sensors provide real time continuous monitoring but are sparsely distributed
- Trained acoustic engineers required
- Strategic noise maps modelled on transport network and around agglomerates but ignore the cumulative impact of noise



Pepys estate

NO UNAUTHORISED
PERSONNEL
BEYOND THIS POINT

NO
PARKING

GATES IN
CONSTANT USE
KEEP CLEAR
AT ALL TIMES

ALL VIS
MUST R
TO REC

CAR BREAKERS
DEPTFORD LTD

NO
PARKING

CUSTOMERS
MUST REPORT TO
RECEPTION
THANK YOU

CUSTOMERS
MUST REPORT
TO RECEPTION



~20 directly | ~100 indirectly



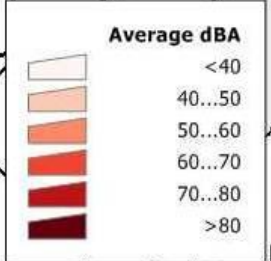
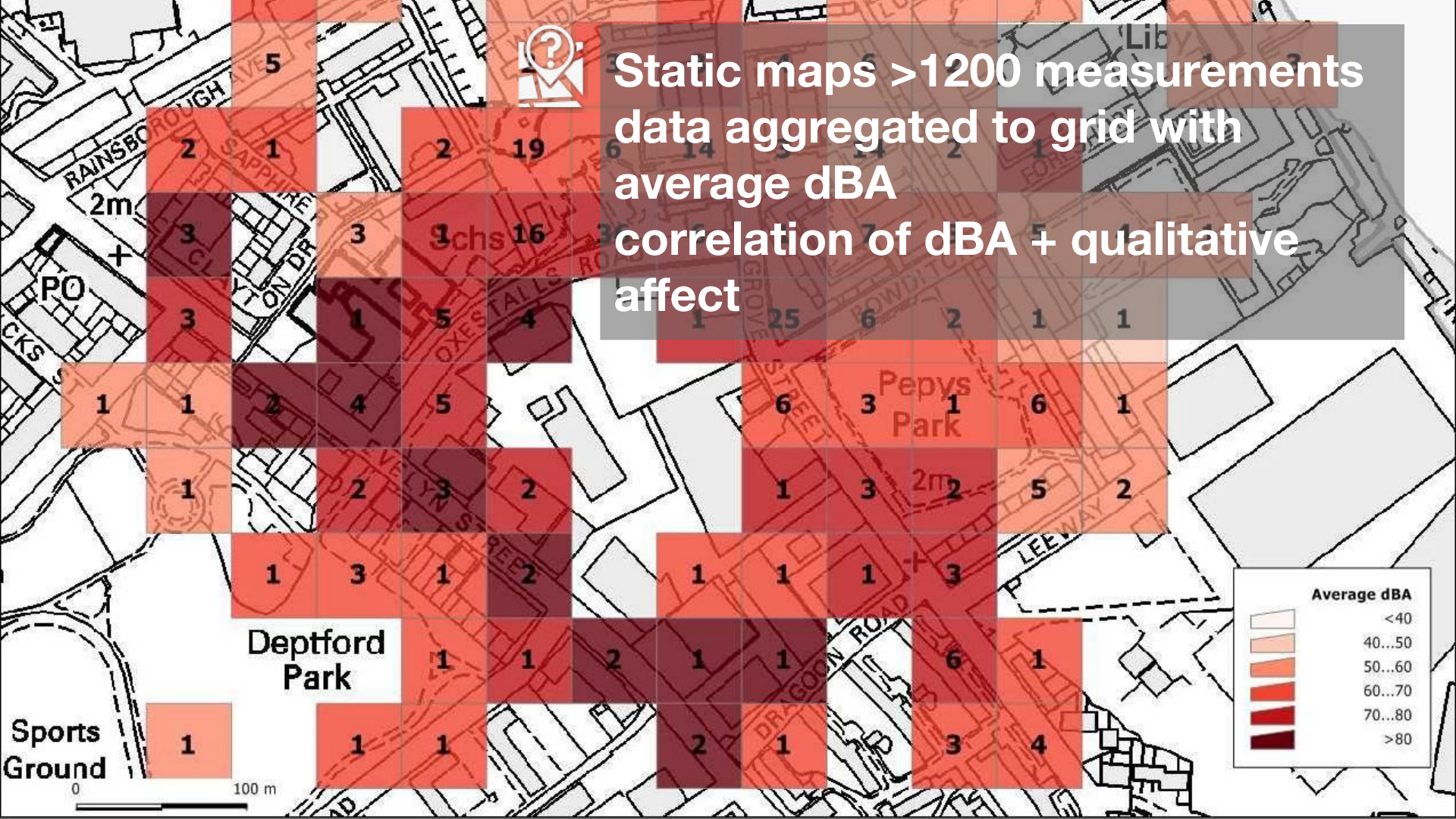
2 months data collection



50m² grid across area
Grade 2 handheld
meters
Measurement in
triplicate / 24hr periods
dBA sound levels +
qualitative data ‘affects’



Static maps >1200 measurements
data aggregated to grid with
average dBA
correlation of dBA + qualitative
affect





Environment Agency appointed an acoustic consultant to carry out a detailed analysis of noise in and from the scrapyard -> scrapyard licence revoked

Royal Docks
Added 5 years ago



Add contribution

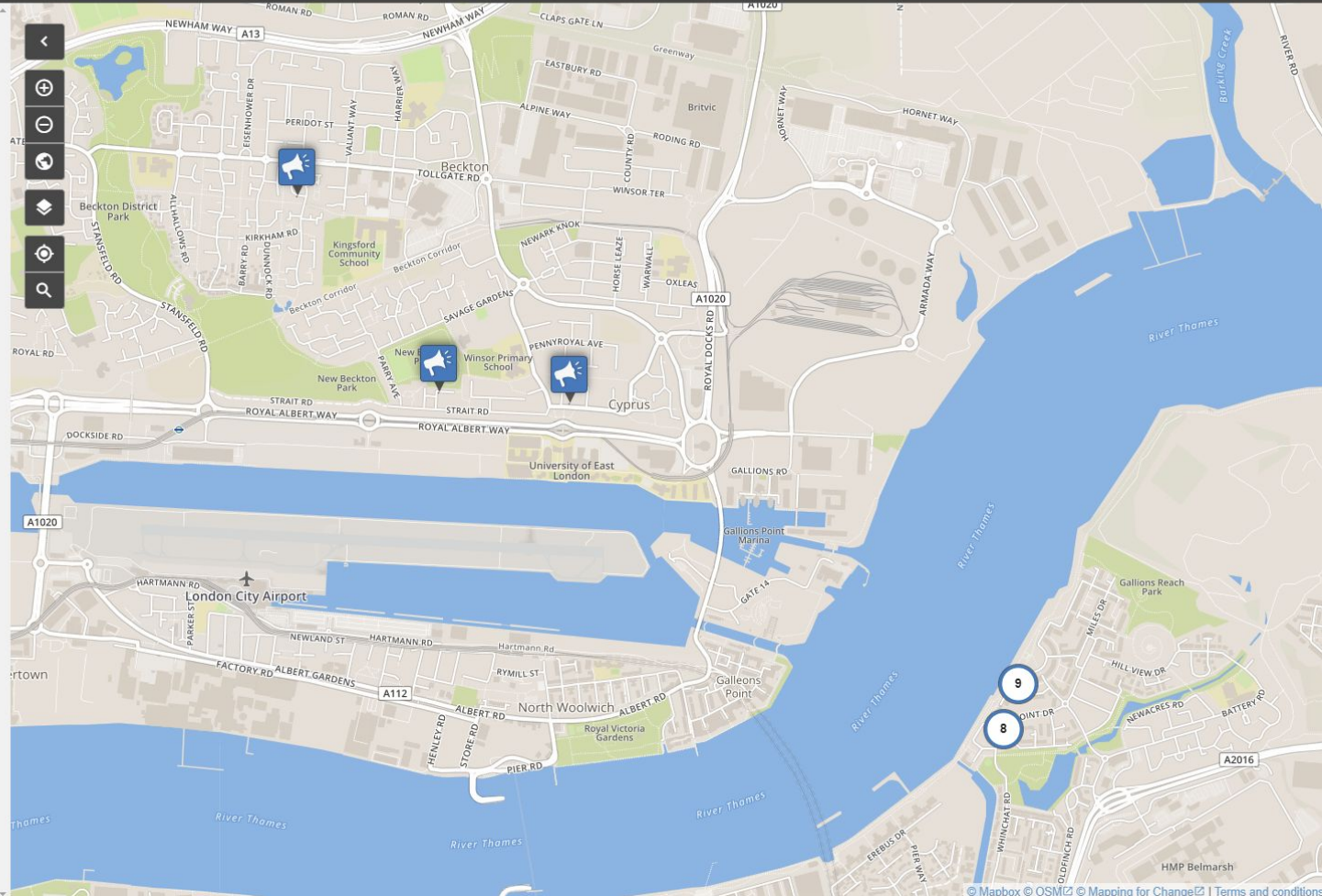
Contribution

Anne-Marie Griffin added 5 years ago

Noise Data

Data Media Comments

Describe the sources of noise taken during your reading
Background, faint distant traffic noise. Extremely quiet, relaxing and peaceful, the quietest for 5 years since jets increased at LCY. Flight ban in place - no Heathrow or London City Airport flights.



EveryAware - Heathrow & Ryl Borough of Windsor



~200 directly | ~1200 indirectly

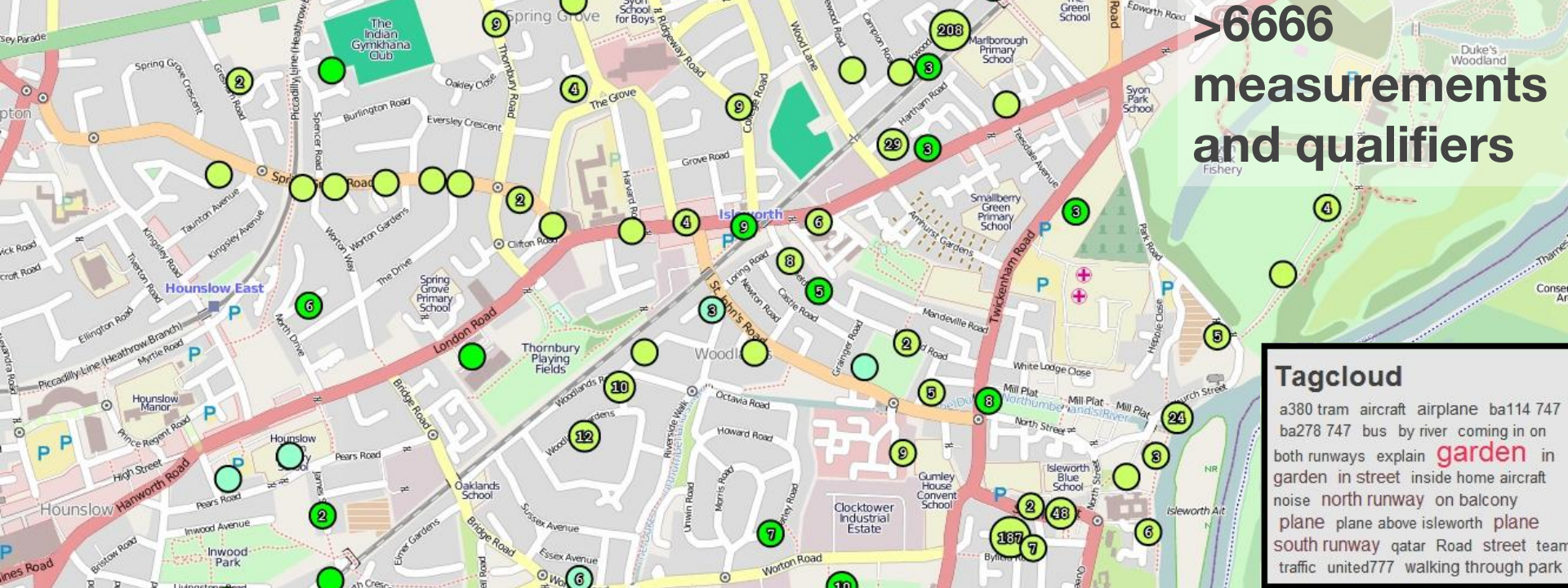


2x6 months data collection



Use the mobile phone app to take noise sample, qualify noise (describe the sound sampled, add tags & include description)





Interactive map
visualising
>6666
measurements
and qualifiers

Tagcloud
 a380 tram aircraft airplane ba114 747
 ba278 747 bus by river coming in on
 both runways explain garden in
 garden in street inside home aircraft
 noise north runway on balcony
 plane plane above isleworth plane
 south runway qatar Road street team
 traffic united777 walking through park

EveryAware - Heathrow & Ryl Borough of Windsor

- Results legitimised the concerns of local residents regarding noise.
- Highlighted the importance of taking into account the community experience and impact of aviation noise on local residents.
- The data was used to submit a response to the Davies Commission

Citizen Science in odour pollution



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Odour pollution management

Traditional odour measuring methods

<https://odourobbservatory.org/>

- Expensive
- Do not give information about odour **NUISANCE**

D-NOSES approach



D-NOSES pilot in Barcelona (FORUM area)



D-NOSES pilot in Barcelona



Two-phase strategy



~95 directly & ~430 indirectly



12 months data collection



596 odour observations

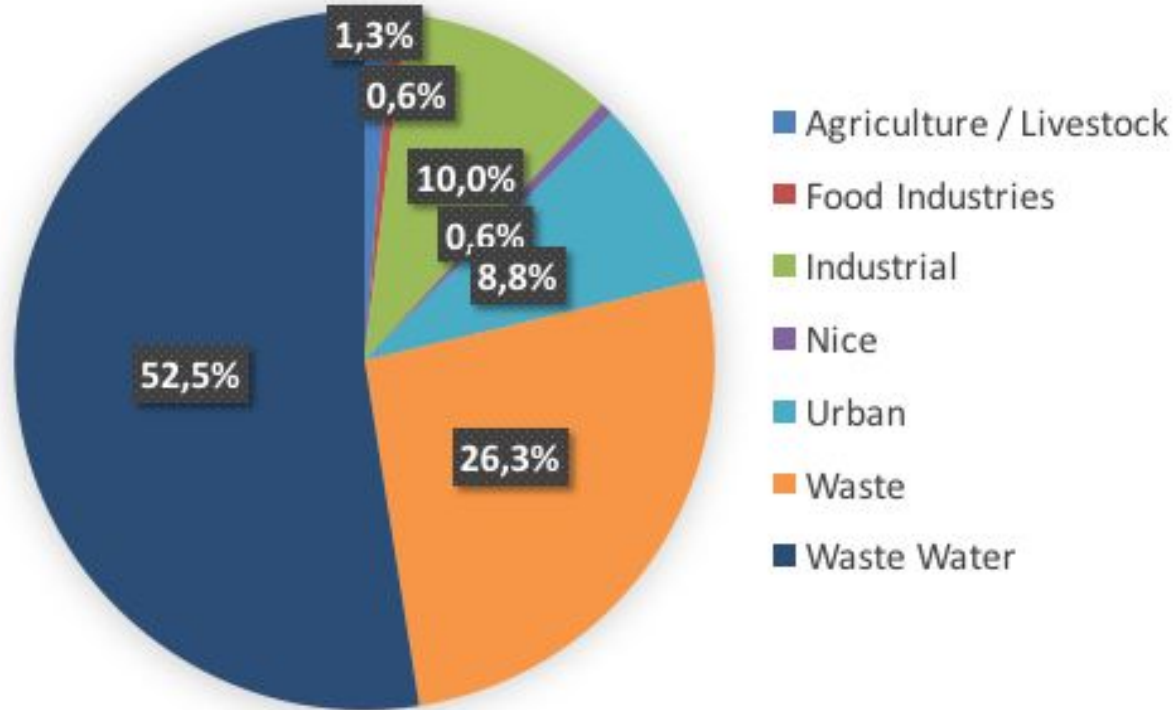


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Types of odours



Next steps...

A hand is pointing to a map of an urban area. The map features several colored circular markers: red, green, and blue. The text 'Tools for environmental monitoring' is overlaid in large white font. The map background shows street names like 'Avenue Field (Recreation Ground)', 'Powder Road', and 'M. The Road'.

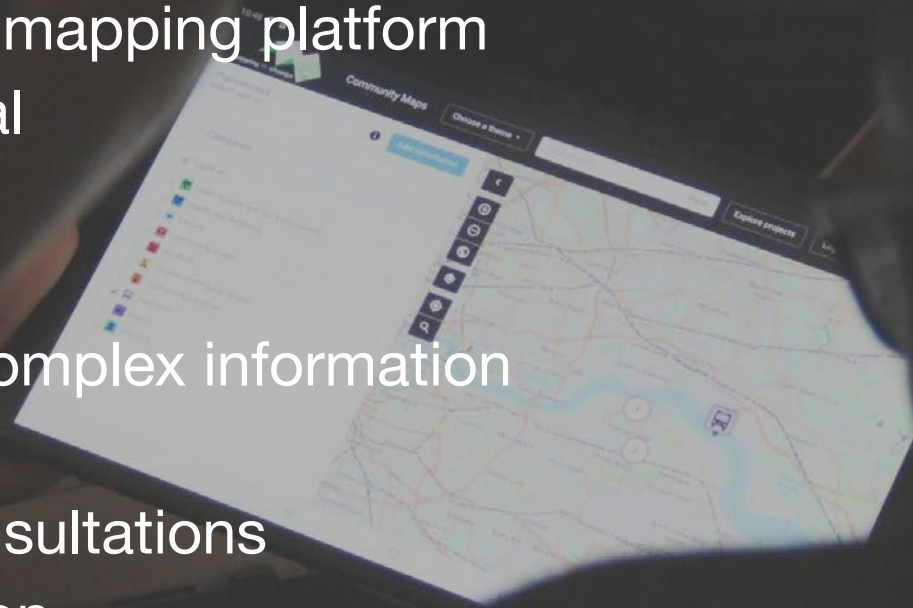
Tools for environmental monitoring

Community Maps

Web based, interactive mapping platform
Responsive, multilingual

Uses

- Visualise and share complex information
- Elicit local knowledge
- Allow transparent consultations
- Inspire collective action
- Gather public perceptions





Odours Affecting Communities

Added 2 years ago

[Add contribution](#)

Categories

Toggle all

- Waste Management
- Waste Water Treatment
- Agriculture/Livestock
- Food Industries
- Industrial
- Urban Odours
- Unknown
- Other

Contributions

Find contributions

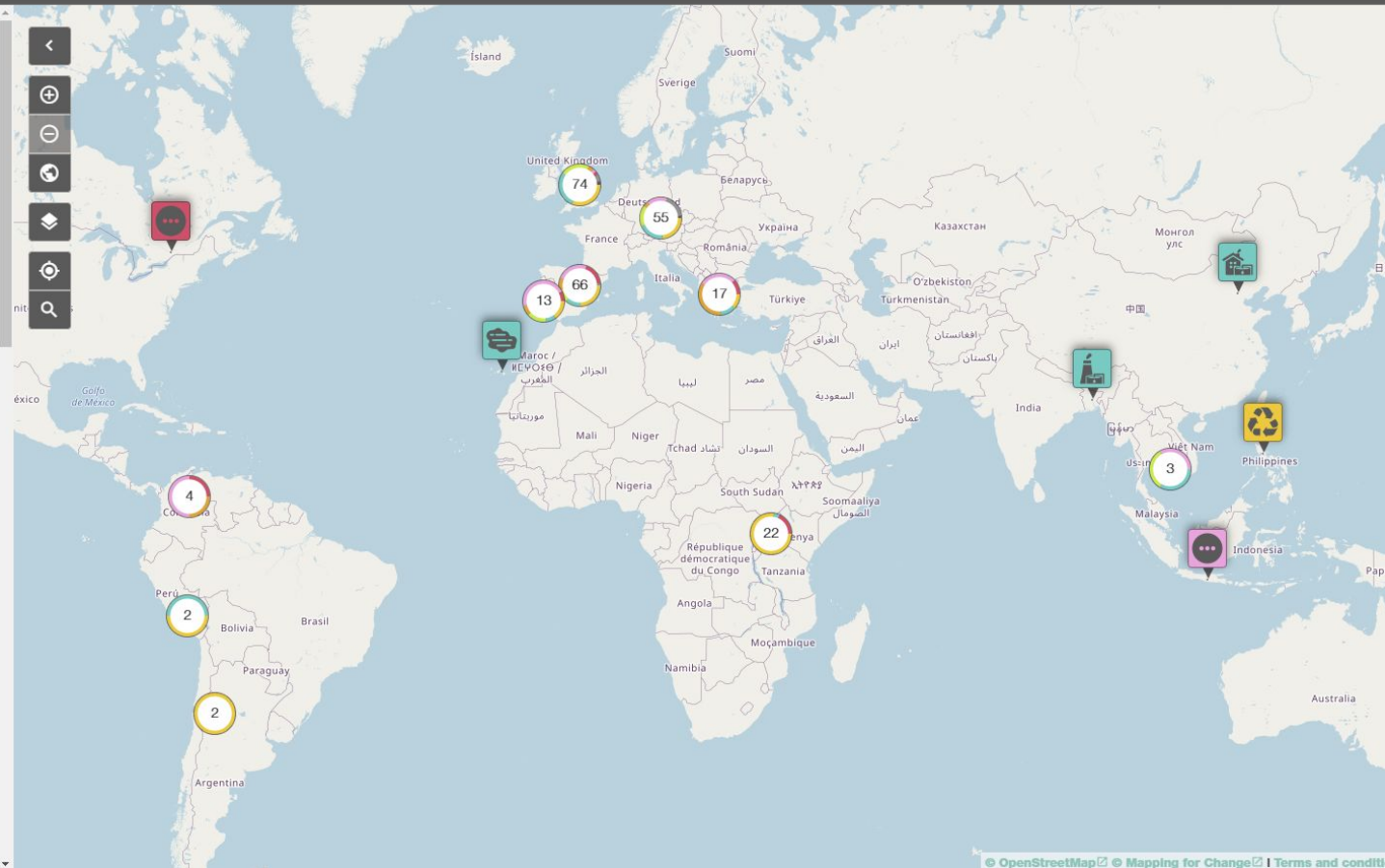
[Clear](#)

- All contributions
- My contributions

- Active
- Review
- Pending
- Draft

Sort by: Date updated

Listing 8 out of 264



Geokey

Odours Affecting Communities

Overview

Categories 8

Subsets 0

User groups 2

Themes 0

Twitter 0

History

Geographic extent

Settings

Overview

[Click here for help](#)

Categories

8

Waste Management
11 fields

Waste Water Treatment
11 fields

Agriculture/Livestock
11 fields

Food Industries
11 fields

Industrial
11 fields

Show 3 more categories

Create category

Subsets

0

No subsets have been created yet.

Create subset

User groups

2

Administrators
5 members

Moderators
15 members

Create user group

Statistics

265

CONTRIBUTIONS

13

COMMENTS

34

MEDIA FILES



Home

Odours Affecting Communities

Added 2 years ago



Add contribution

Categories

Toggle all

- Waste Management
- Waste Water Treatment
- Agriculture/Livestock
- Food Industries
- Industrial
- Urban Odours
- Unknown
- Other

Contributions

Find contributions

Clear

- All contributions
- My contributions

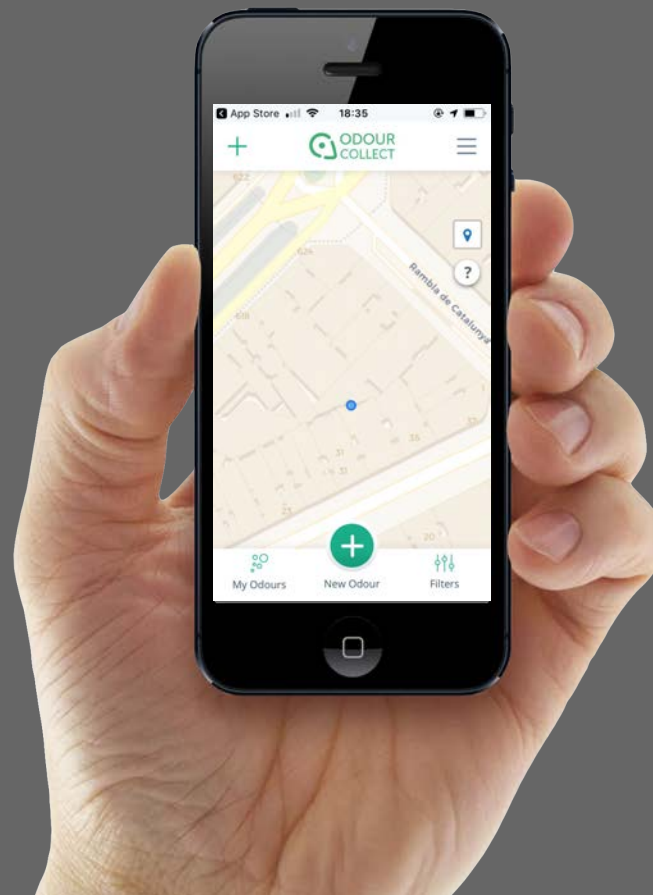
- Active
- Pending
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- Draft

Sort by: Date updated

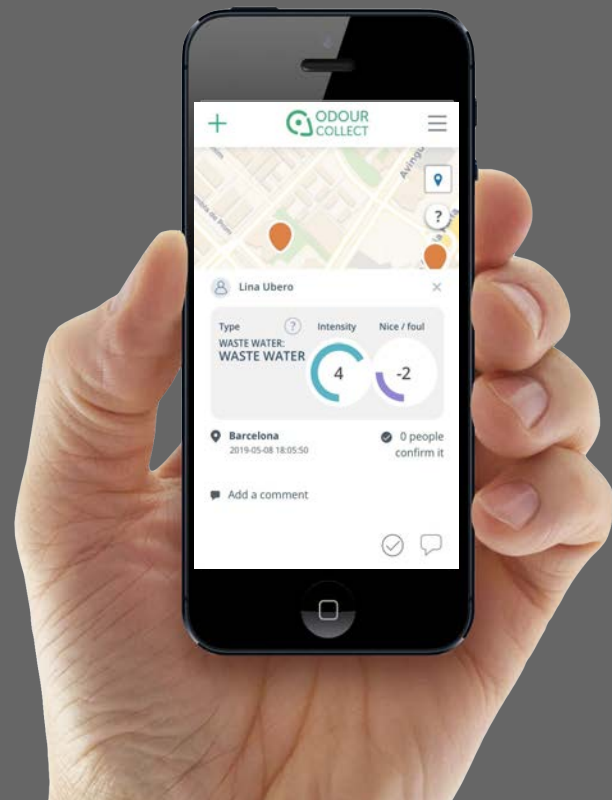
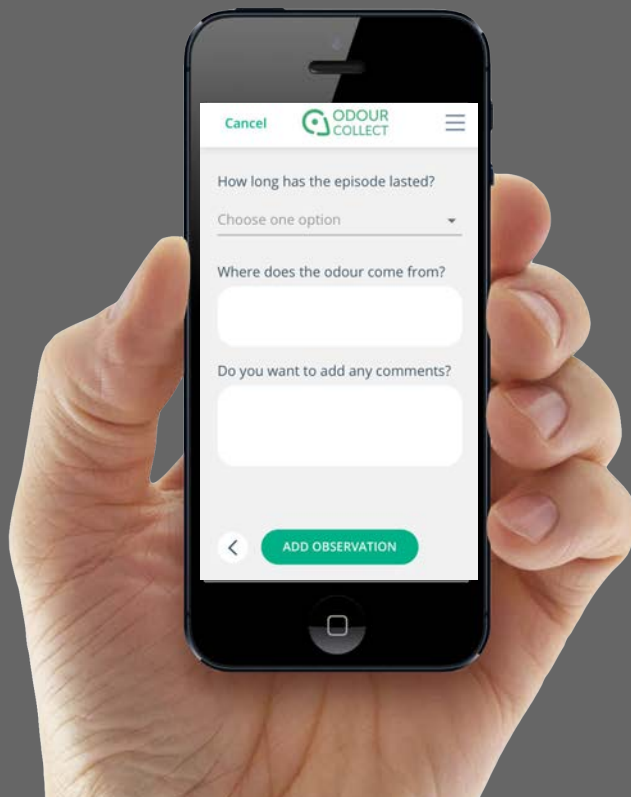
Go to Settings to activate Windows

OdourCollect

OdourCollect is a free app to report odour observations. A tool to collect real-time odour observations.



OdourCollect



OdourCollect Dashboard



DASHBOARD

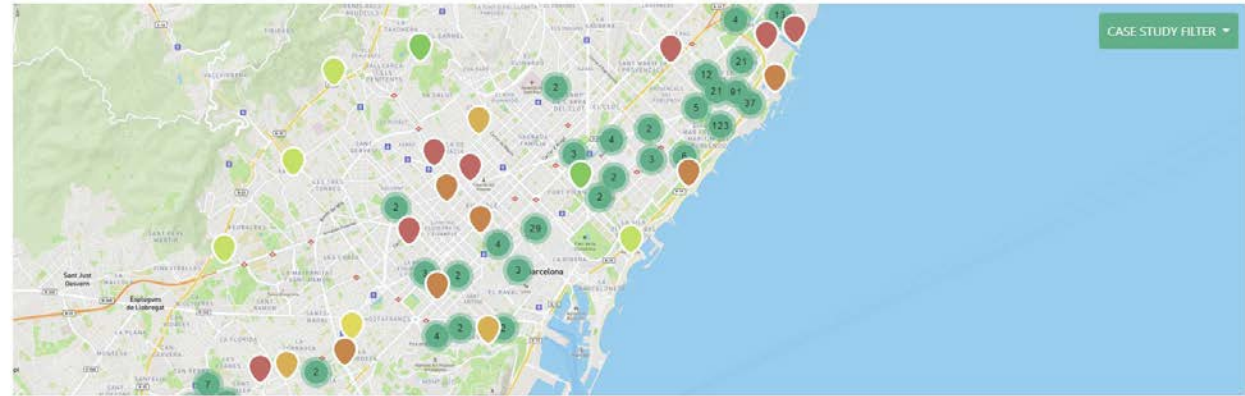
STATISTICS

USERS

OBSERVATIONS

ACTIVITIES OF INTEREST

ATTACH OBSERVATIONS TO CASE STUDIES



DOWNLOAD XLSX

Type Status Intensity Nice/foul Case study

Published dates (dd/mm/yyyy)

From dd/mm/yyyy To dd/mm/yyyy



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OdourCollect Dashboard



DASHBOARD

STATISTICS

USERS

OBSERVATIONS

ACTIVITIES OF INTEREST

Marc Suárez González

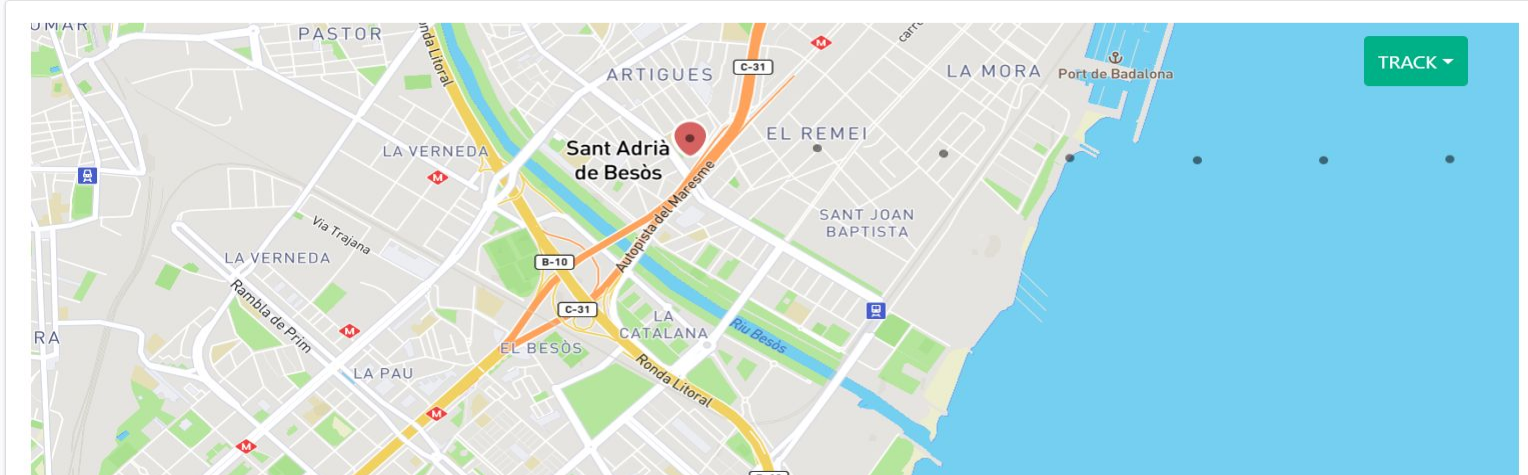
Carrer De Sant Jordi 5, 08930 Sant Adrià de Besòs, Barcelona, Spain

July 15, 2020, 9:11 pm

Waste / Decomposed waste

TERSA

Visible:

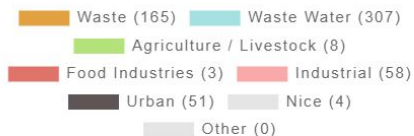


OdourCollect Dashboard



- DASHBOARD
- STATISTICS
- USERS
- OBSERVATIONS
- ACTIVITIES OF INTEREST

OBSERVATIONS TYPES (%)



TOTAL: 596

OBSERVATIONS INTENSITIES (%)



TOTAL: 596

OBSERVATIONS NICE/FOUL (%)



TOTAL: 596

COMMENTED OBSERVATIONS



VALIDATED OBSERVATIONS





Citizen Science in Environmental monitoring



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**In which steps of your
current environmental
monitoring procedures
could you incorporate CS?**



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A hand is pointing to a map of an urban area. The map features several colored circular markers: red, green, and blue. The text 'Thank you' is overlaid in the center in a large, white, sans-serif font. The background is a detailed street map with labels for various roads and landmarks.

Thank you