

ME-NET

Design and Development Process

COMMON
KNOWLEDGE

Common Knowledge is a
not-for-profit worker co-op
that builds digital tools for
social and climate justice.

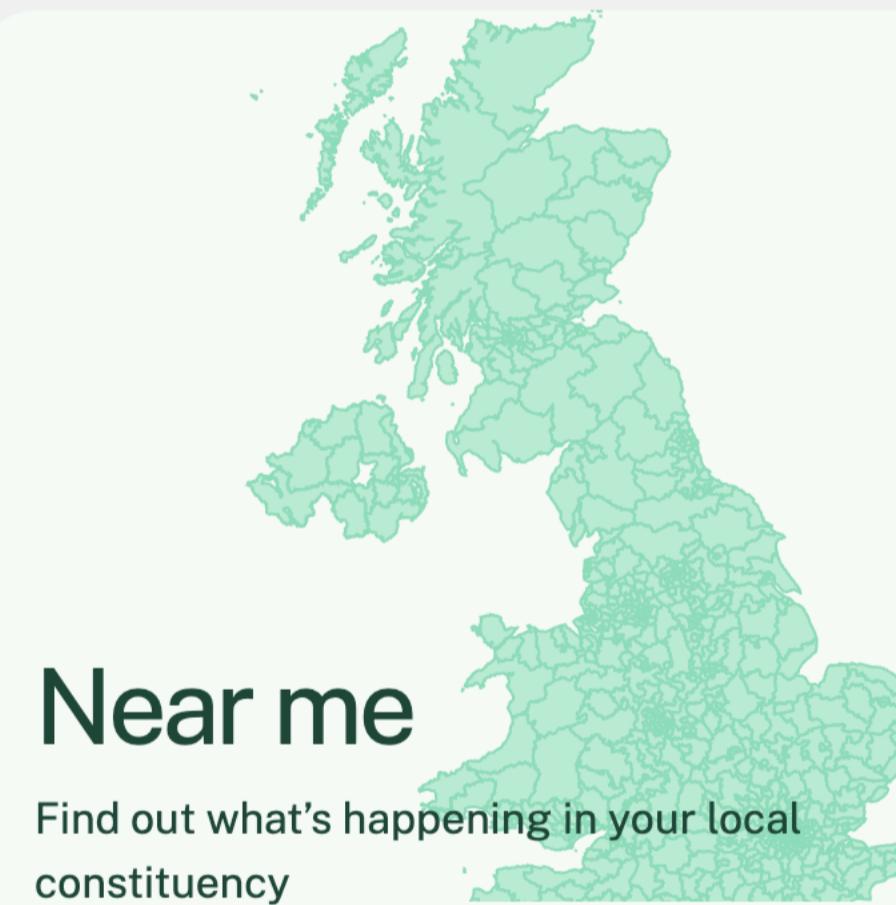


UNITED
FOR PEOPLE,
CLIMATE &
NATURE

Latest Get Involved Near Me

Ways to get involved

Here's how you can help centre people, climate and nature this election.



Near me

Find out what's happening in your local constituency

postcode

Search

Powered using [Mapped](#) by Common Knowledge



Create or join a Hustings event

Local candidate debates are being organised by people like you up and down the country



Join the Running Out of Time Relay

Learn more about the country's biggest sporting event for the climate



Speak to your candidates

Guides and ideas to speak directly to your candidate and sway their opinion



Online actions, petitions and more

Find out how you can sway the election through online action



Attend training events

Find trainings to help you feel equipped as a campaigner



Get involved in the Great Big Green Week

Join the UK's biggest ever celebration of community action

A prototype web app to explore the impact of methane on respiratory and mental health.

User groups

User Groups

Summary

User groups

Primary

People with respiratory health concerns in pilot locations (UK and Ghana)

People caring for family members with health conditions

Secondary

Health professionals and carers

Their goals

Track their symptoms

Track their family member's symptoms

Prevent illness

Learn about climate change and health risks

Enable patients to track their symptoms

Our goals

Improve data from citizen self-reporting

Reduce data hesitancy

Prevent illness

Improve understanding of impacts of methane on health

Improve understanding of impacts of methane on health

Tertiary

Local councillors

Improve health in their region

Policymakers

Develop policies

Representatives from methane-emitting industries

Improve public perception

Academics

Train early warning models in regional contexts

Policy change

Emissions reduction

Facilitate regional communities of practice

User Stories

People with respiratory health concerns in pilot locations (UK and Ghana)

Track health symptoms

Avoid health risks

Explore localised air pollution data

Learn about how environmental factors impact health outcomes

Report symptoms, including time and location

Get alerts when there are ozone risks in their area

Explore data visualisation / map of pollutants and health risks over time

Read a concise explanation of the science behind this project

Create personal health profile

Understand key health recommendations

Search for a specific location

See data visualisations and diagrams illustrating key concepts

Feel reassured that app and corresponding research is sound

Explore data visualisation / map of pollutants and health risks over time

Filter by year, pollutant, severity of risk

Follow external links to learn more

Feel reassured that personal data is encrypted and anonymised

Access app outside, on the go and with slow connections

Understanding the impact
of methane on health



Educational modules

Self-reporting
health symptoms



Diarying app

Mapping methane
emissions over time



Air pollution
impact map

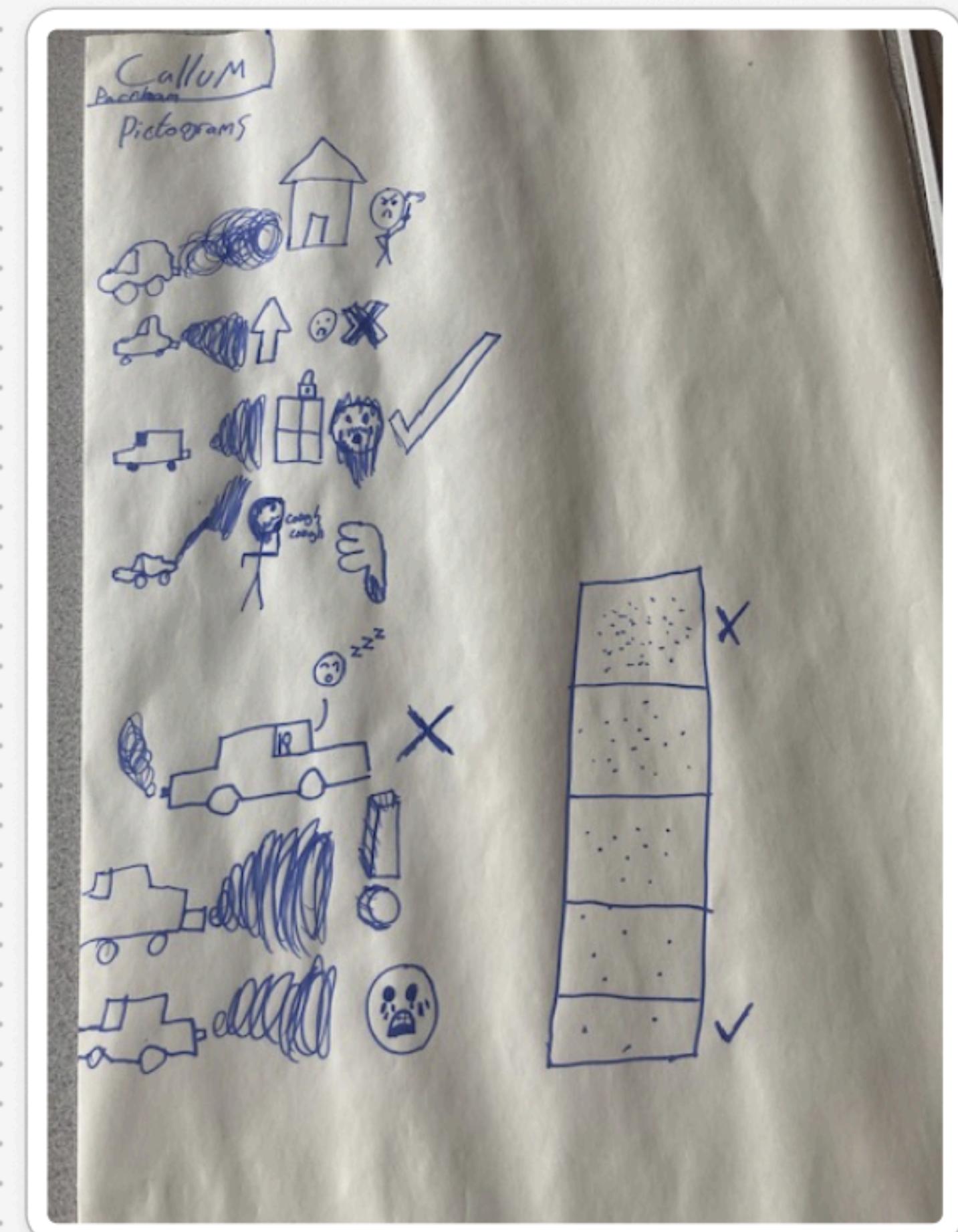
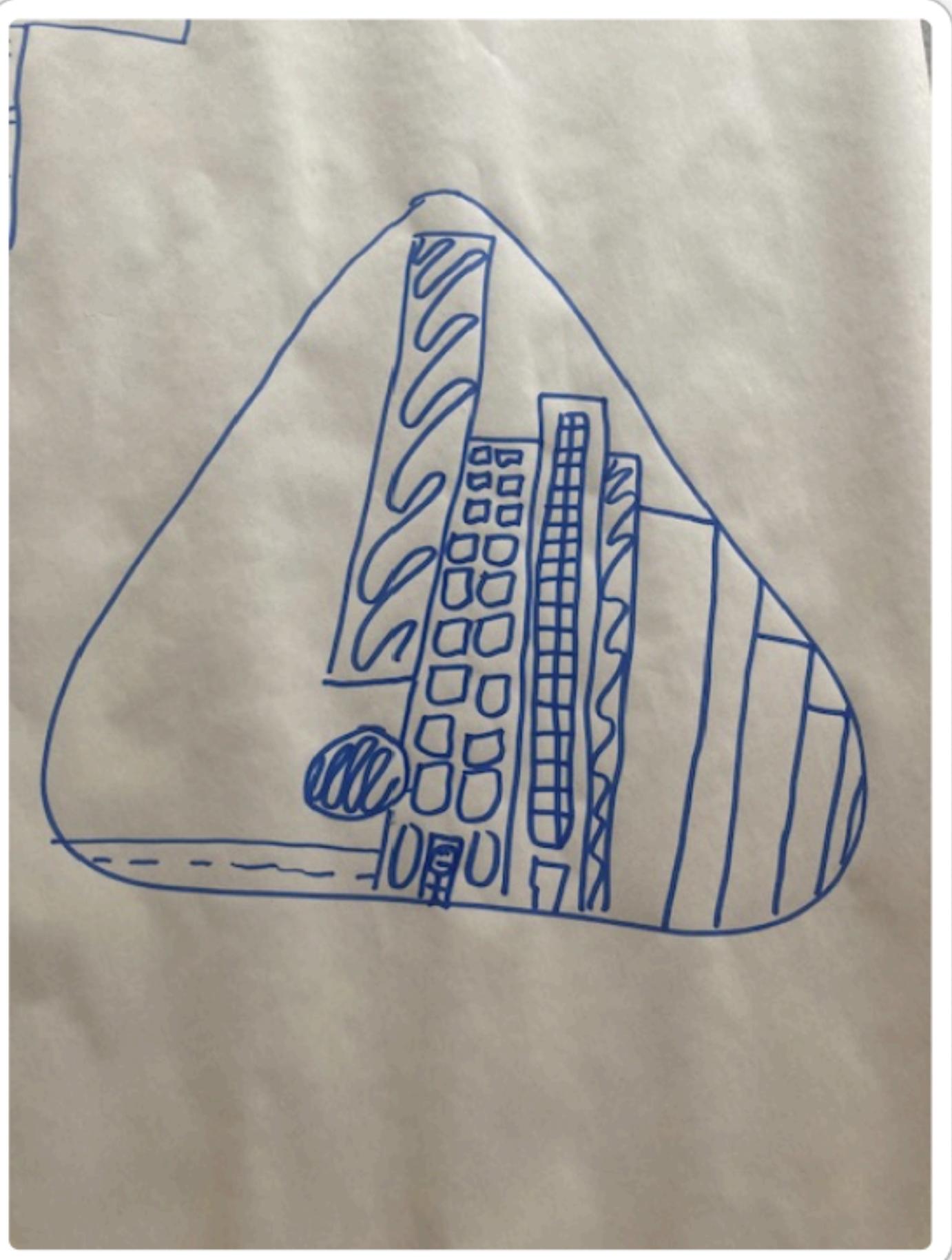
Understanding the impact of methane on health

How Bad Air Things Get Out

- air jumes
- heat/sun
- How it affects



- Car emit ommit fumes from the fuel.
- This goes and hits the sun
- The sun heat up because of the fumes



ME-NET

DESIGN AND DEVELOPMENT PROCESS

REPORTING APP

Self-reporting symptoms

ME – NET

The Methane Emissions Network is a citizen science project to try to better understand, and predict, the impacts of methane emissions on health



Get Started

I already have a profile

Next

ME – NET

How often would you like to be prompted to report any symptoms you may have?

Every day



How would you like to receive notifications?

Text messages

Emails

← Back

→ Finish

ME – NET

What medical conditions from the below list do you have, if any?

Chest tightness

Coughing

Shortness of breath or wheezing

Chest tightness

Coughing

Shortness of breath or wheezing

← Back

→ Next

What are you reporting today?

Respiratory Health

My Wellbeing

Quick or detailed report?

Quick Detailed

← Back

Which symptoms do you have?

Chest tightness Coughing

Shortness of breath or wheezing

← Back → Next

How severe is your cough?

Where 1 means 'not at all' and 7 means 'very severe symptoms'.

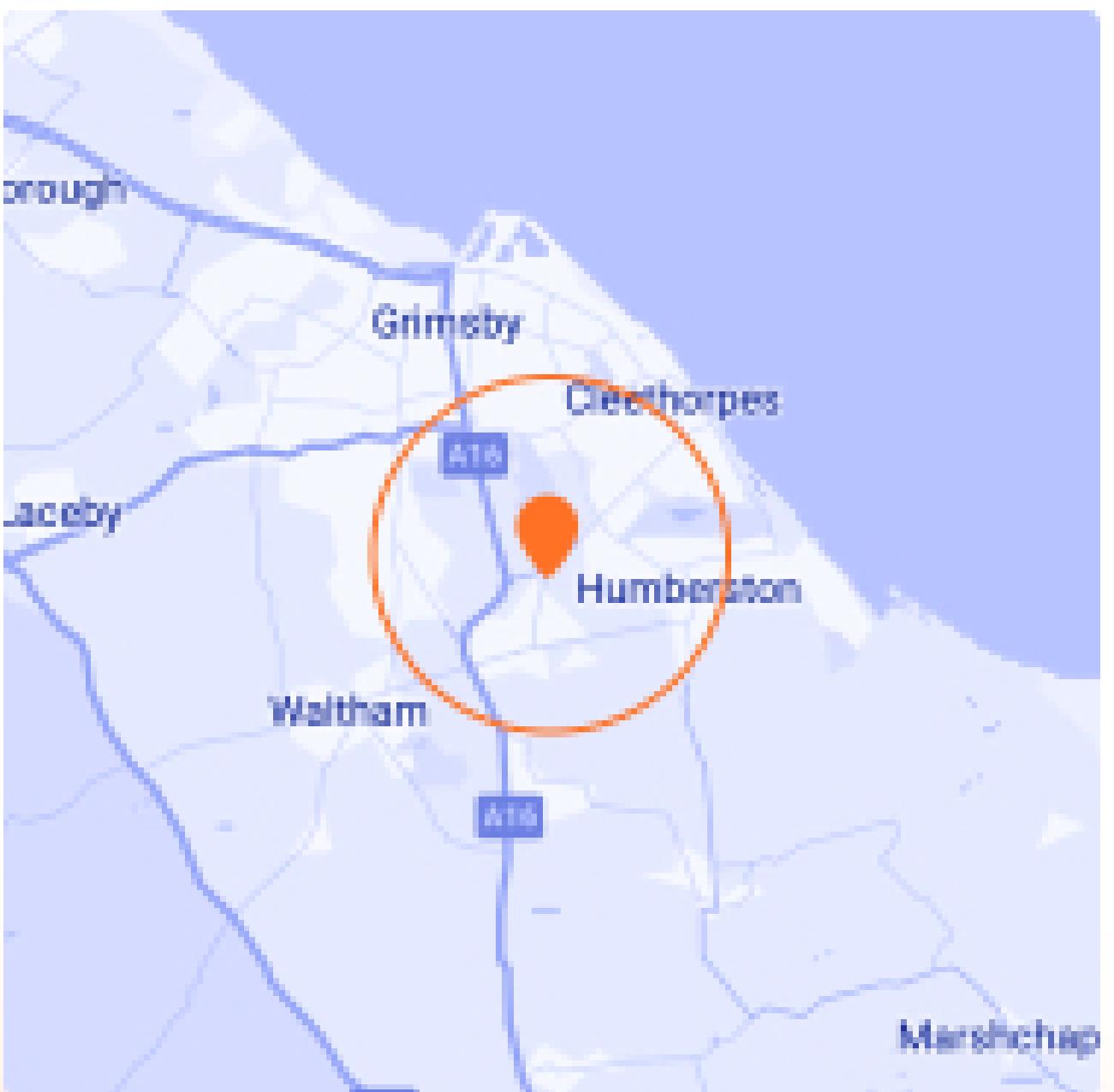
1 2 3 **4** 5 6 7

← Not at all Very severe →

← Back

Where did these symptoms begin occurring?

Choose a rough location on the map below.



← Back

→ Next

How do you feel?



Bad



Ok



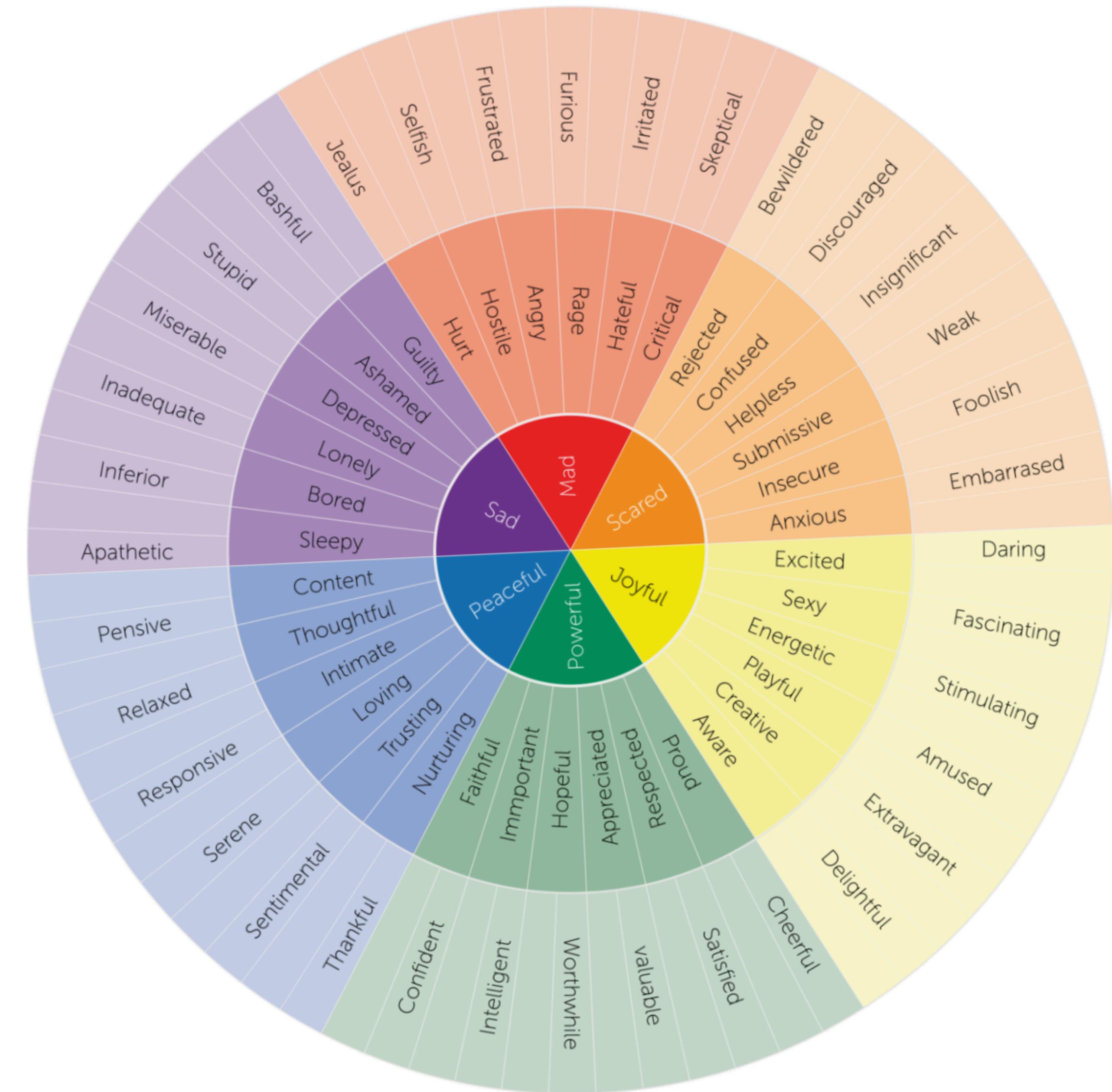
Good

Add more details

Add anything else you would like to mention or leave blank and press next to continue

← Back

→ Submit Report

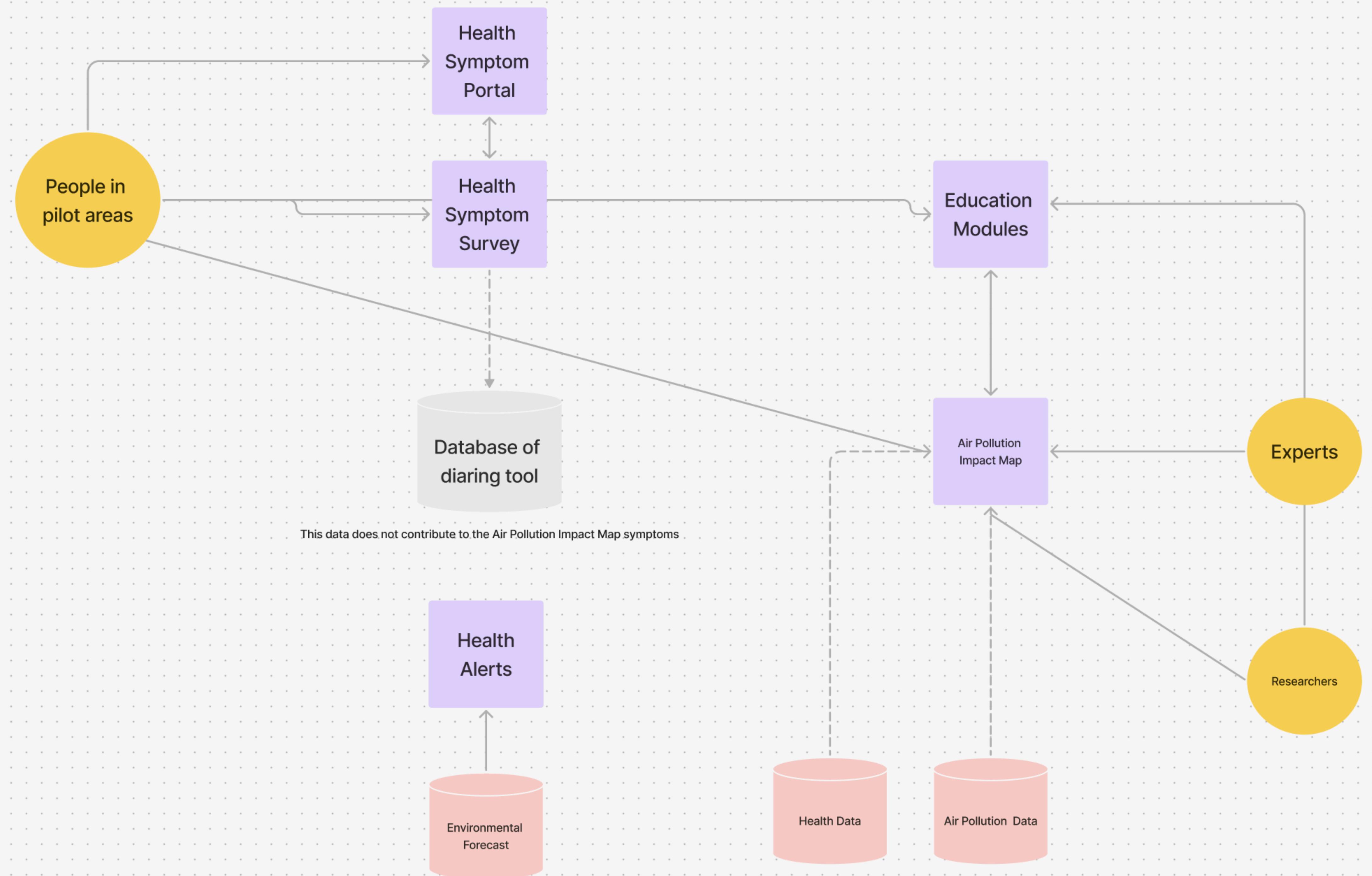


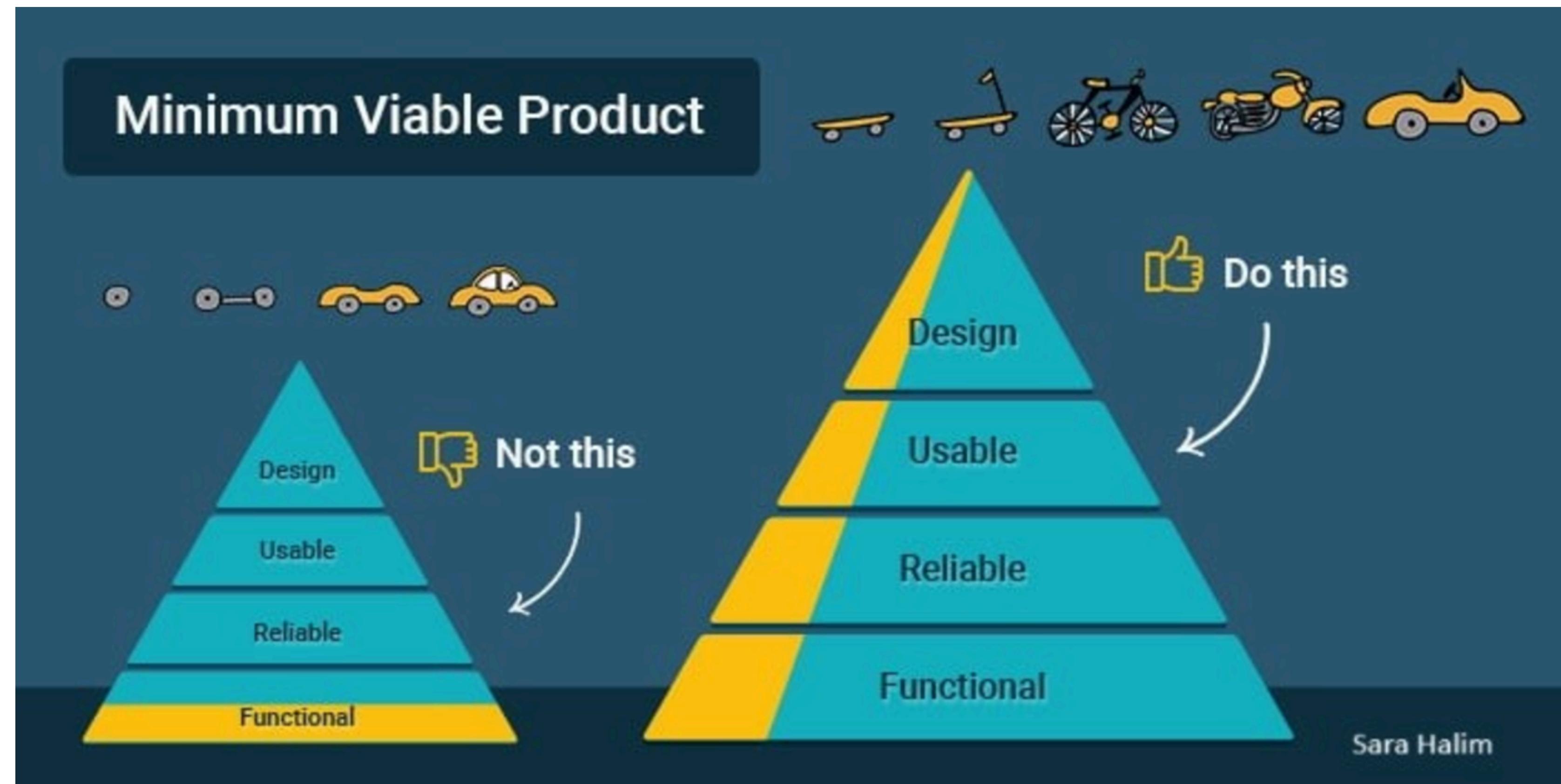
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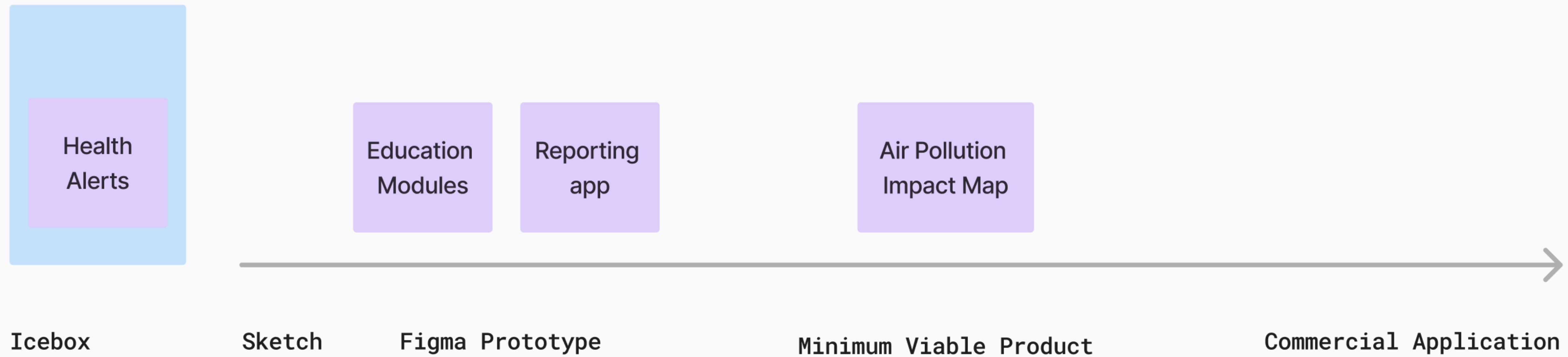
SCOPING AND PRIORITISING

Scoping and prioritising





Fidelity Mapping

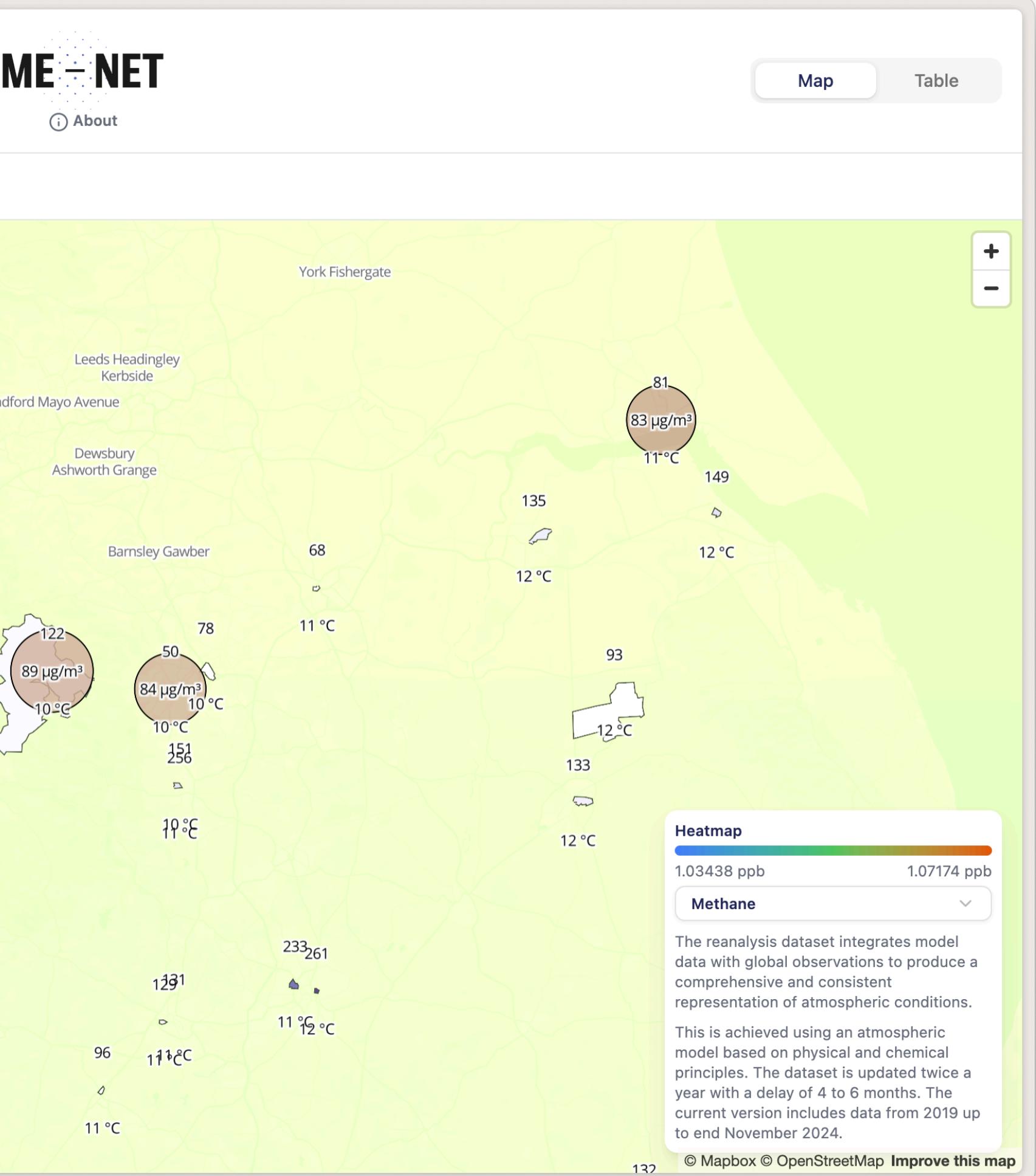
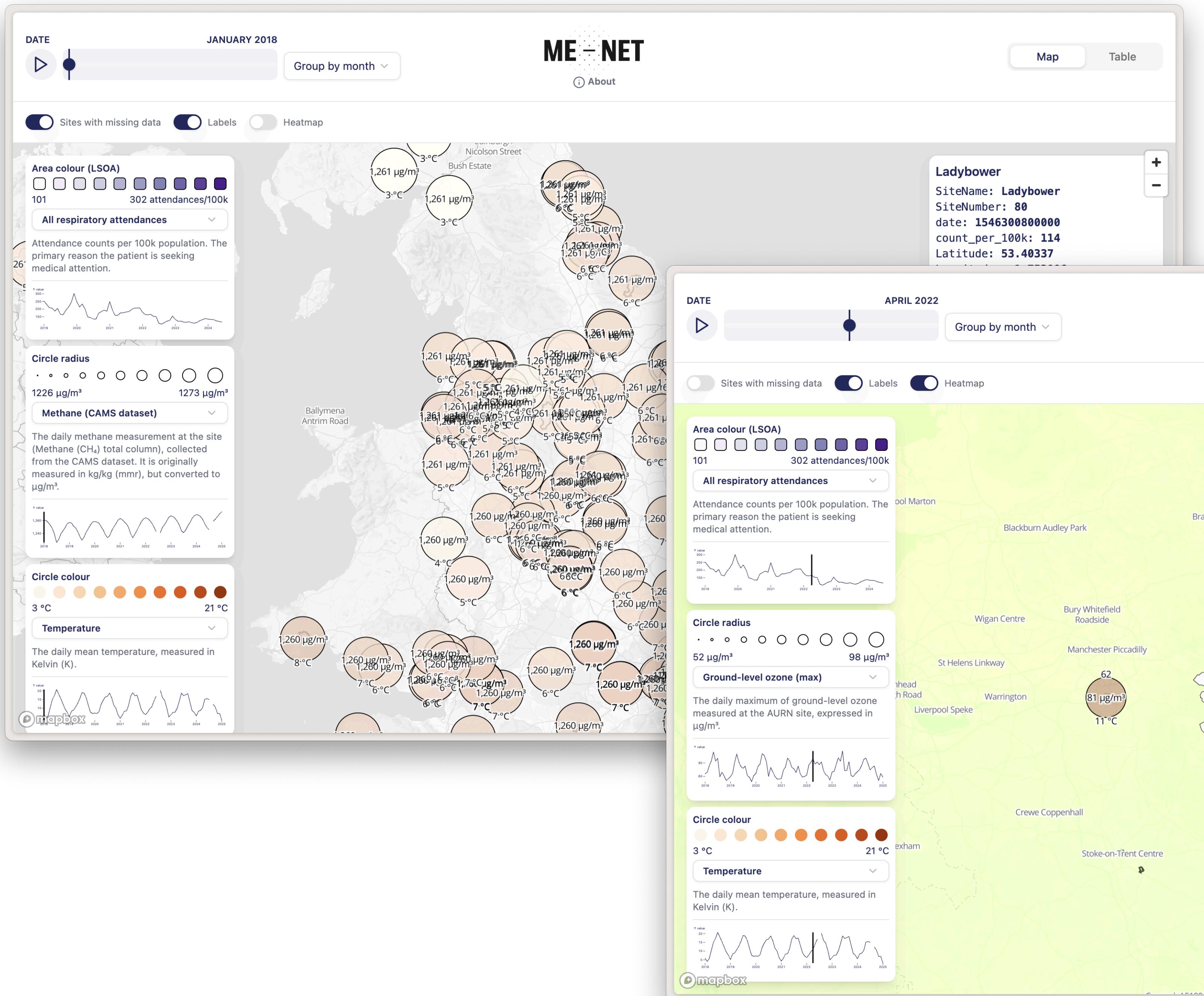


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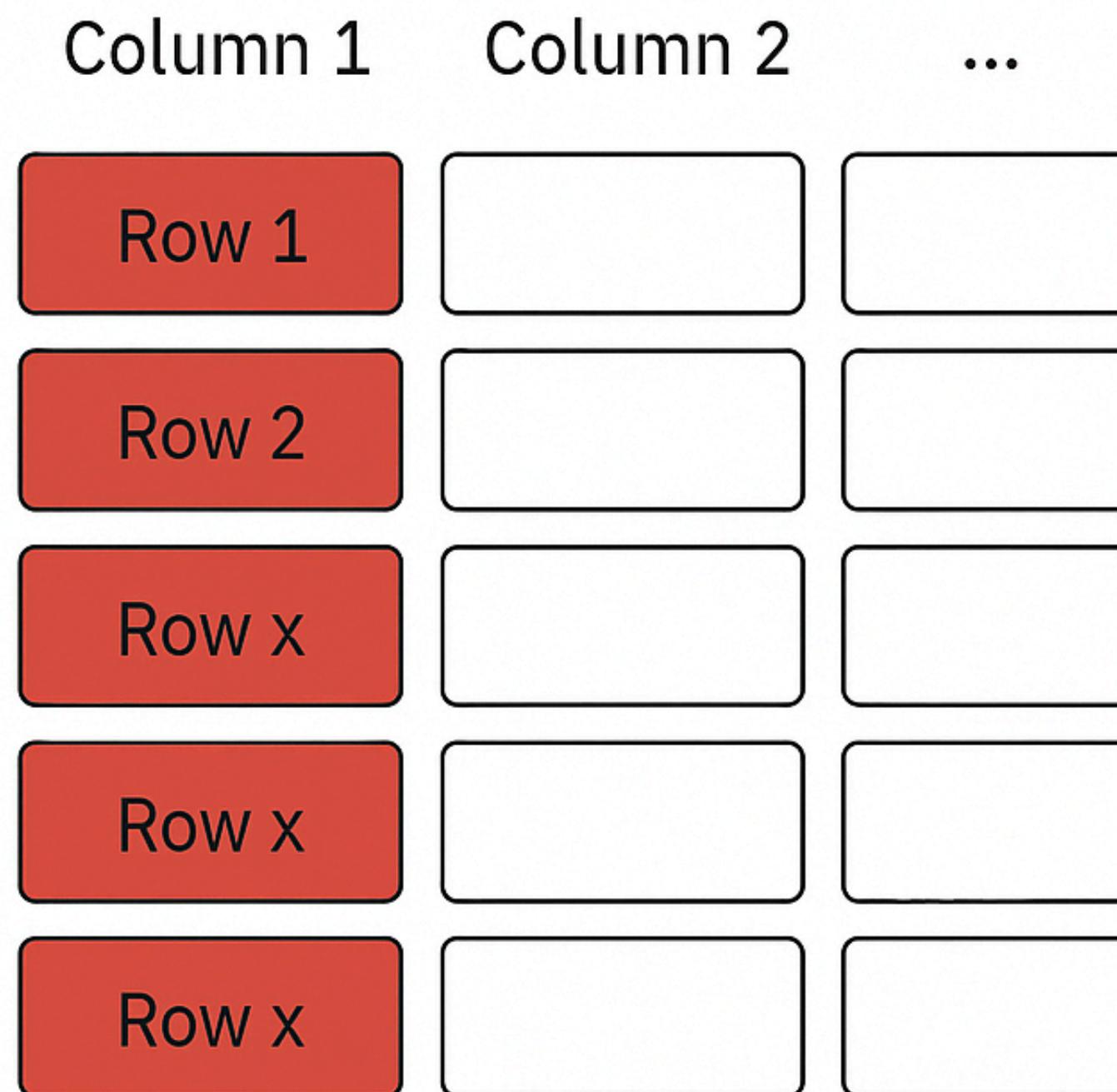
MAPPING METHANE EMISSIONS

Mapping methane emissions



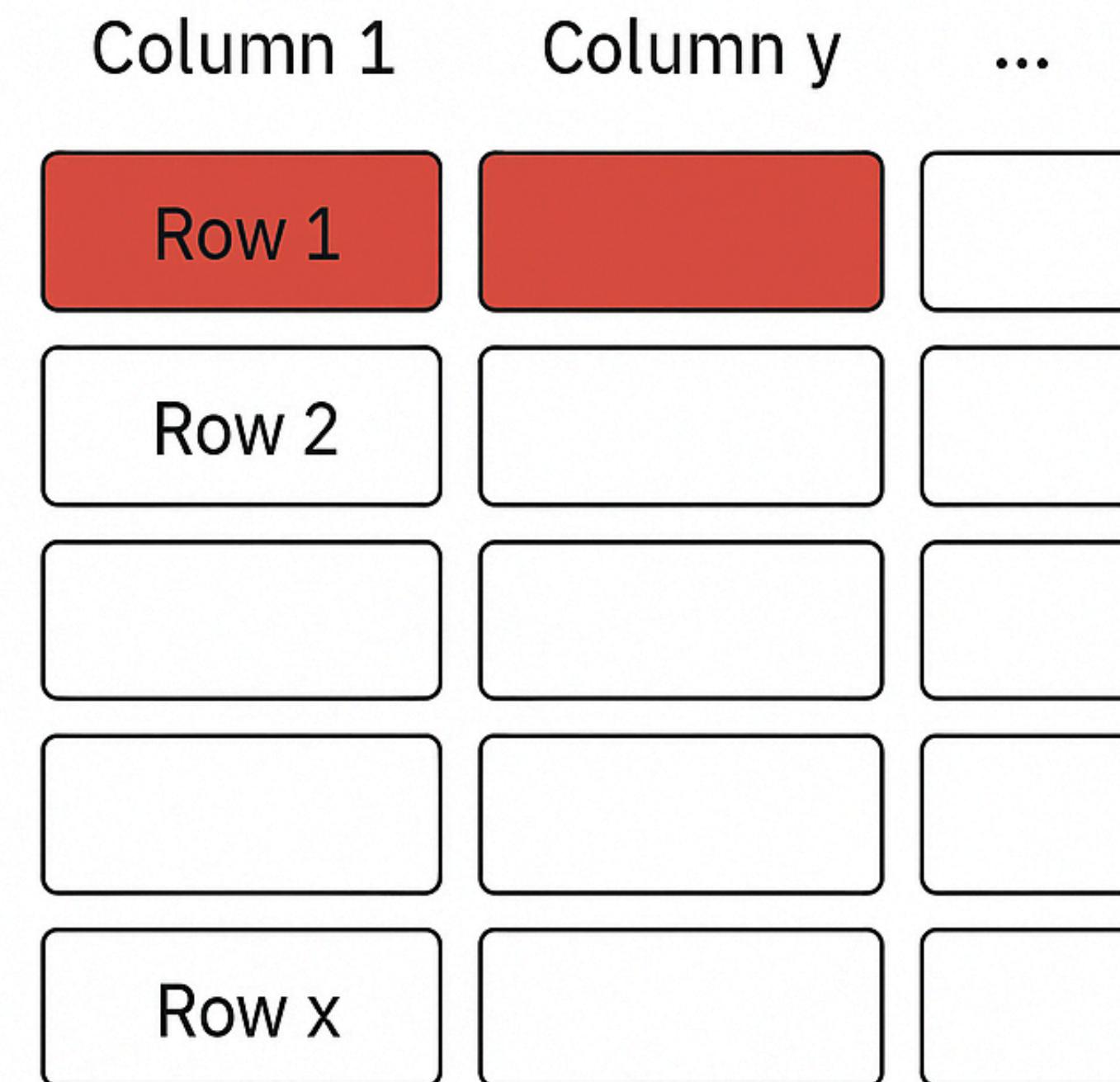
- DuckDB – a zero dependency columnar analytical database
- DuckDB Spatial Extension
- DuckDB WASM – runs the whole thing in the browser
- Apache Parquet files (crucial)
- Next.js / Tailwind
- Python – xarray, pandas, pyarrow

Columnar Database



■ Stored together on disk

Row-oriented Database



■ Stored together on disk

The screenshot shows the official website for DuckDB. At the top, there's a dark header with the DuckDB logo, a search bar, navigation links for "Documentation" and "Resources", a GitHub link showing 28.9k stars, and a yellow "Support" button. Below the header, the main title "DuckDB is a fast portable database system" is displayed in large white text, with "portable" highlighted in a green box. A subtext below it reads: "Query and transform your data anywhere using DuckDB's feature-rich SQL dialect". At the bottom of this section are two buttons: "Installation" and "Documentation", with "Documentation" being yellow. To the right, there's a code editor window titled "SQL" showing an aggregation query:

```
1 -- Get the top-3 busiest train stations
2 SELECT
3     station_name,
4     count(*) AS num_services
5 FROM train_services
6 GROUP BY ALL
7 ORDER BY num_services DESC
8 LIMIT 3;
```

Below the code editor are two buttons: "Aggregation query" and "Live demo →".

- We get data dumps in NetCDF file formats from John
- Convert to Parquet
- Read into DuckDB
- Offline merge with coordinates and time to single file
- Heavily compressed by Zstandard (zstd) compression library, via Parquet
- Reduced from 15GB to 15MB
- DuckDB reads this in chunks, so it doesn't need to decompress 15MB to 15GB in memory in the browser

```
big_table = duckdb.sql("""
    select * from (
        select
            SiteName,
            SiteNumber,
            datetrunc('day', "Time") as date,
            cast(avg(Primary_Impression_Count * 100000.0 / Population) as integer) as count_per_100k,
            Latitude,
            Longitude,
            gss,
            Population,
            cast(avg(aurn_go3) as integer) as aurn_go3,
            cast(avg(aurn_go3_max) as integer) as aurn_go3_max,
            cast(avg(ch4_c) as integer) as ch4_c,
            cast(avg(CH4_S) as integer) as CH4_S,
            cast(avg(t - 273.15) as integer) as t
        from (
            SELECT *
            FROM sites
            left join climate on (
                climate.SiteNumber = sites.SiteNumber
            )
            left join health on (
                health.SiteNumber = sites.SiteNumber
                and climate.Time = health.Time
            )
        ) as combined
        where date is not null
        group by SiteName, SiteNumber, date, Latitude, Longitude, gss, Population
        order by date, SiteNumber
    )
    ....
```

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Demo

May 3, 2025

GEO

DUCKDB

UX

DuckDB is Probably the Most Important Geospatial Software of the Last Decade

What happens when you embed geospatial capabilities in generalist data tools? More people engaging with geo data.

I just returned from the inaugural [Cloud-Native Geospatial conference](#). It was fantastic, I highly recommend you jump in if Jed and team organized another.

One of the core questions discussed in the breakouts and in the halls was how to broaden the geospatial audience. How can we better communicate geo data's utility, in all industries and domains? Many tactics and case studies were debated, but the one I kept coming back to is that of DuckDB.

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