AN AIR-QUALITY-APP FOR GERMANY

The German Environment Agency develops an air quality app. As of summer 2018, citizens can use the modern media to quickly and conveniently find out about the air quality.

The challenge

Air quality is an important issue nowadays, especially in urban areas. It is monitored throughout Germany by the individual federal states and the German Environment Agency. Air quality is determined on the basis of the amount of air pollutants. However, this data only provides information for a single location.

The German Environment Agency provides the general public with information in all areas pertaining to the environment, including air quality. For this purpose, modern media such as, for example, the internet or apps, is used. For our app, we have used data from European modelling for the creation of an "air-quality-app", which is currently being developed and will be launched in the summer of 2018.

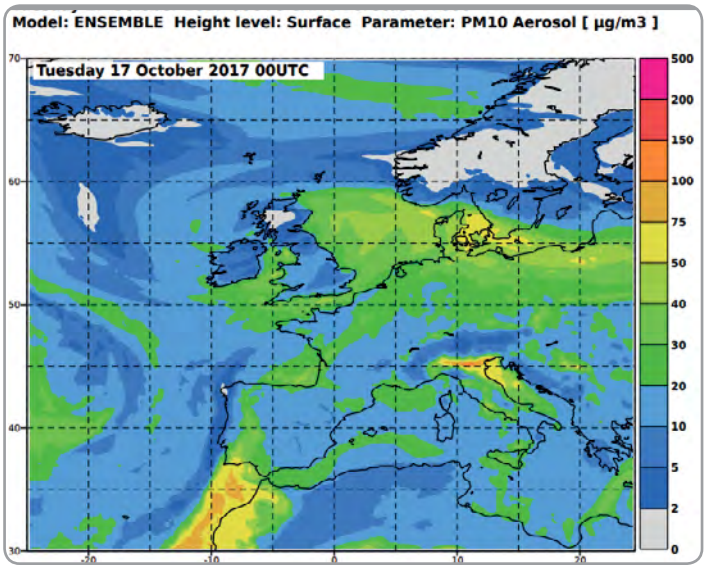
The space based solution

The app will be used to forecast ambient concentrations of ozone, nitrogen dioxide and particulate matter (PM10). This back-end data will be downloaded from the Copernicus Atmosphere Monitoring Service (CAMS), which indicates the daily production of near-real-time European air quality forecasts with a multi-model ensemble system. In-situ measurements of meteorology value and the forecast data, the emission sources, in-situ measurements of concentration of pollutants as well as satellite data are being used for the model calculations. The spatial resolution of models is set at a 15 x15 km grid. It can be concluded - the row data is suitable for background. Therefore, we have corrected the predicted concentration of pollutants. Users can find this corrected forecast on our app. The data obtained from the Copernicus Atmosphere Monitoring Service or satellite data has a great advantage (in contrast to in-situ measurements) – it is spatial information. This spatial information will support us (the German Environment Agency, Unit "Air") in our daily business, for example, in periods of high pollution concentration.

Benefits to Citizens

The air quality app will serve to inform and warn citizens. The app is free. Thus, individuals (in possession of a smartphone) at home or on the road can get information on current, location-specific air quality. This information is of particular interest to individuals belonging to higher risk groups, such as elderly people, pregnant women, children and individuals with chronic diseases (for example, asthma).

Additionally, this app sets out to raise public awareness of air quality. App users will be able to compare forecasts with the limits and target values of the Directive on Ambient Air Quality and Cleaner Air for Europe as well as with recommendations of the World Health Organization. Exceedance has health and financial



Particulate matter (PM10) concentration in µg/m³ predicted for 17.10.2017 00 UTC, CAMS ensemble forecast.
Credit: Contains Copernicus Service information [2017]

Thematic Area: PUBLIC HEALTH

Region of Application: BERLIN GERMANY

Sentinel mission used: S5P

Copernicus Service used: CAMS

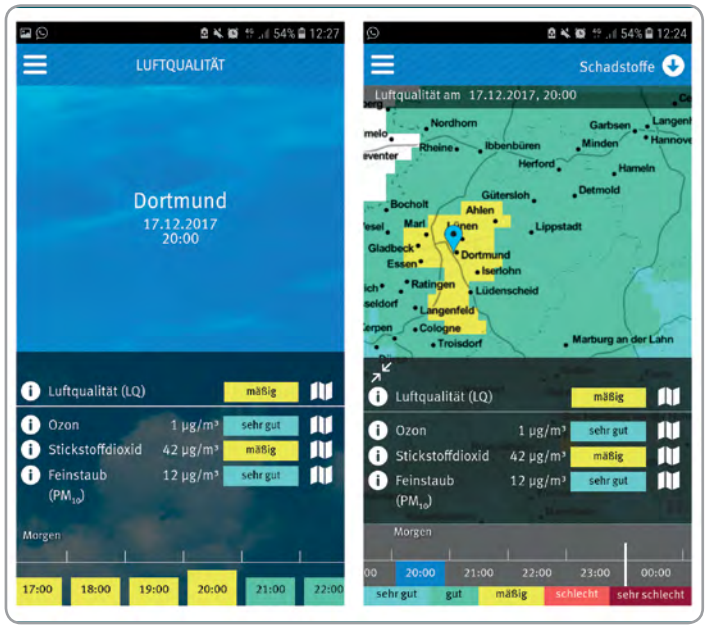
Usage Maturity Level: 4

consequences and the EU will sue and monetary penalise the affected Member States.

The air quality information is described briefly and simply, and, thus, is easily to understand by everyone. The information can be obtained quickly and conveniently.

Outlook to the future

The app will be especially useful to inform users in case of higher pollution. Then, people can react and adjust their behaviour accordingly. For example, the ozone concentration increases under summer conditions with intensive sunlight. If you belong to a higher risk group, you can decide whether to reduce or delay any outdoor activity like doing sports. The app provides this information in the menu called "Verhaltensempfehlung" (eng. "Recommendations for behaviour").



Two screenshots of air-quality-app, left information about a location, right map with air quality classes.
Credit: Contains modified Copernicus Service information [2017]

> "We hope our APP will help people plan their leisure time activities whilst raising the public awareness of air quality."
>
> ***Ute Dauert,***
> ***German Environment Agency***

With the development of the operational Sentinel, new air quality data becomes available. By using this data in the modelling, the model quality can be improved. The Sentinel-5 precursor was designed to provide input-data for the Copernicus Atmosphere Monitoring Service (CAMS). We, the German Environment Agency, plan to continue to use the forecast data from the CAMS in the future, not only for our app, but also for our website and our daily business.

Acknowledgements

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ABOUT COPERNICUS4REGIONS

This Copernicus User Story is extracted from the publication "**The Ever Growing use of Copernicus across Europe's Regions: a selection of 99 user stories by local and regional authorities**", 2018, Edited by NEREUS, the European Space Agency and the European Commission.
The model cases focus on local and regional authorities who successfully applied Copernicus data in 8 major public policy domains.
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