

Mapping air pollution exposure risk in Port-au-Prince



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Background

Exposure to air pollution has been consistently linked to increased morbidity and mortality for a range of diseases, including asthma.

Air pollution in urban areas in developing countries, and those affected by humanitarian emergencies, is an increasing issue and at the same time an increasing degree of humanitarian response is taking place in urban settings.

Where MSF are providing healthcare for populations at risk of exposure to air pollution, an understanding of air pollution exposure risk as a public health issue is paramount.

Outdoor air pollution has a range of short and long term effects on health. Importantly, it can contribute to both the development of chronic diseases, particularly respiratory but has links to many others, and also lead to acute exacerbations of those illnesses. For an overview, see [the WHO website](#).

Prevention and health promotion activity on this issue requires a better understanding of who is at risk: where and how monitoring or prevention can be targeted to reduce exposure risk



Air pollution is a substantial and increasing cause of morbidity and mortality worldwide, including in urban contexts in humanitarian settings

Our solution

In Port-au-Prince, as in many similar contexts, directly measured levels of air pollution are not available. In order to map potential exposure risk a series of proxy measures are needed²:

- Distance from roads
- Road type
- Traffic volume
- Building density

GIS was used to generate layers for each of these variables, and basic analysis used to combine them into an overall score for air pollution exposure risk at any point on the map.

This is then used to provide a score for individual buildings, including points of interest such as schools or healthcare facilities. Mapping can also be used to identify the size of the population at risk.

Through identifying areas at particularly high risk, these mapping products can be used in advocacy, to identify hotspots for air pollution monitoring and for targeting health promotion activity.

Asthma in Martissant

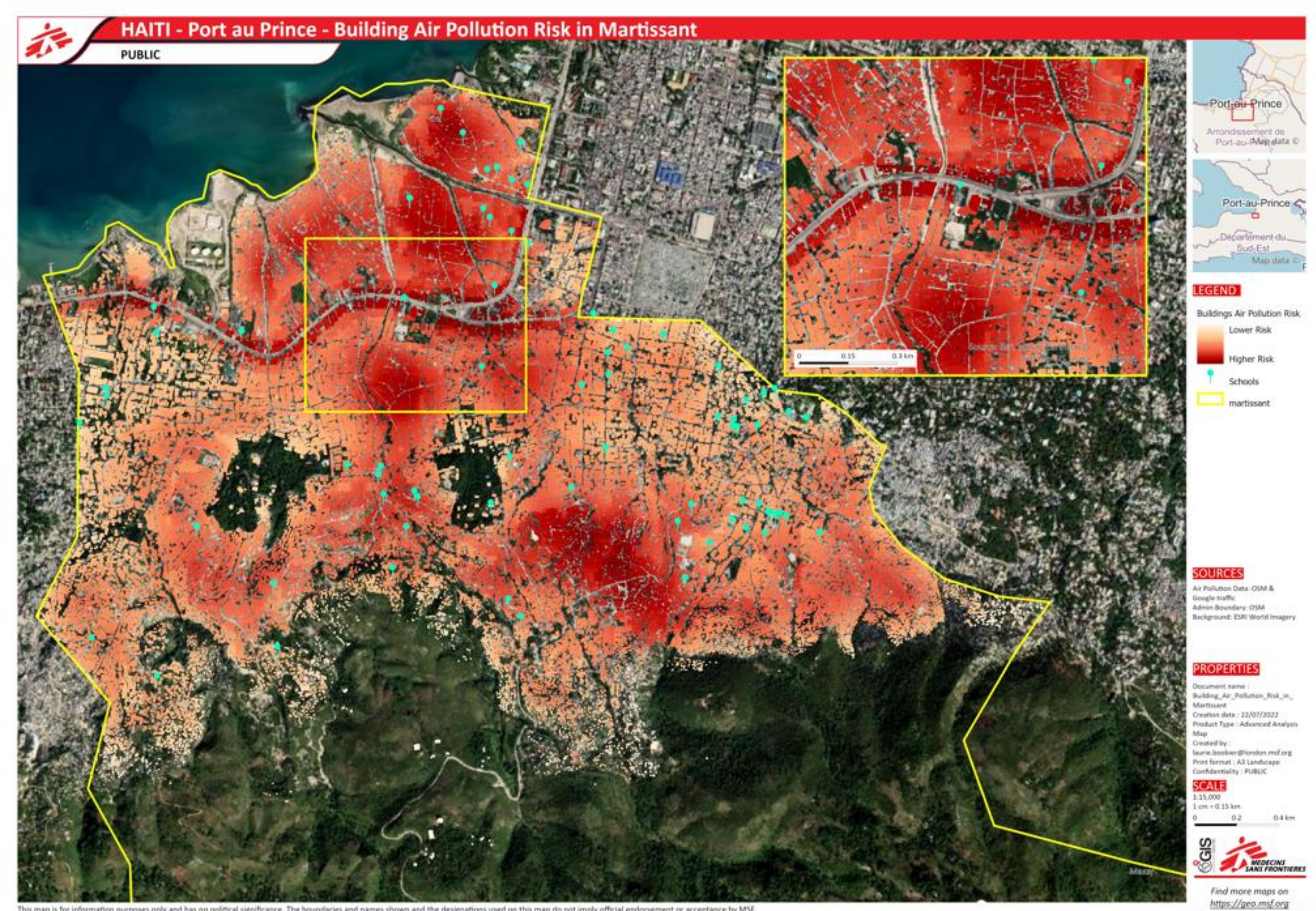
Port-au-Prince

Martissant, a neighbourhood in the South of Port-au-Prince, Haiti, is characterised by high volumes of vehicle traffic, along the Route Nationale, and domestic fuel burning and use of diesel generators in informal settlements.

In 2021, MSF OCB teams in Haiti identified a high burden of asthma amongst patients attending for urgent care at their MSF facility in Martissant: up to 15% of cases overall attending the Martissant Hospital. Initial time series analysis of these cases showed a seasonal distribution¹.

WHO and Ministère de la Santé Publique et de la Population (MSPP) teams have conducted limited air quality monitoring in other areas of Port-au-Prince, but the risk of exposure to air pollution in this setting is not well understood.

MSF Canada Humanitarian Action on Climate and the Environment (HACE), with the support of the Manson Unit, MSF UK, were tasked with investigating these findings given the known high burden of air pollution in this neighbourhood.



Mapping product showing air pollution exposure risk in Martissant, Port-au-Prince

What can you do?

We want to support other MSF project teams, particularly those providing healthcare in urban settings, to explore air pollution exposure risk. We have created a package that can be used by staff in MSF projects even with only limited GIS experience. This includes:

- An SOP detailing a reproducible methodology for creating these mapping products
- A concept note, including suggestions for using these products

These resources are available within the Sci Days exhibition space, or can be shared by contacting the study team.

Notes

1. For a detailed overview of the time series analysis, please get in contact with the project team.
2. For a detailed overview of sources of data and how these were used, see the concept note provided alongside the project materials.

Further information

For questions or comments, and a full list of references used in this study, contact:

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