UNIVERSITY OF EXETER

ENVIRONMENTAL INTELLIGENCE

Global Air Quality and Health

The importance of international interdisciplinary collaboration to address global challenges

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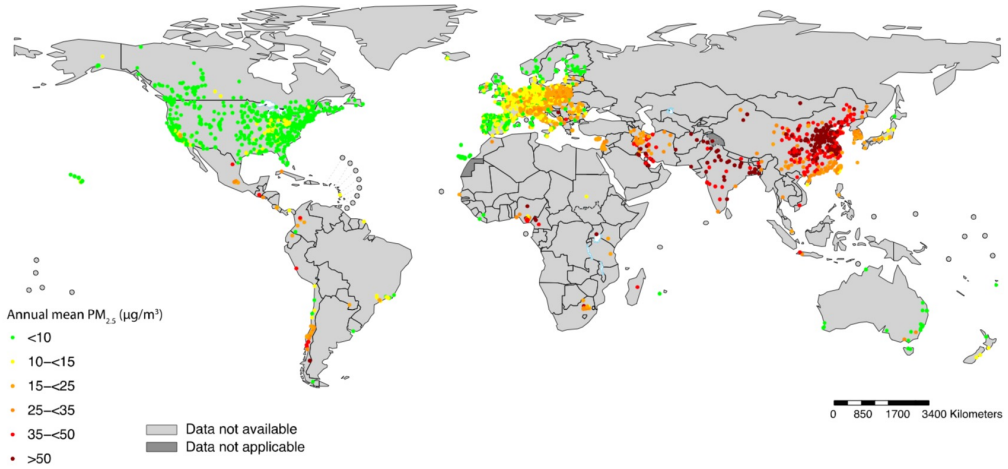
AIR POLLUTION AND HEALTH

- The World Health Organization estimates that 4.2 million premature deaths every year can be attributed to ambient (outdoor) air pollution
- Over 90% of people worldwide are exposed to harmful levels of fine particulate air pollution
- The quality of the air we breathe varies greatly across the globe, with populations in many low- and middle-income countries suffering from the highest exposures

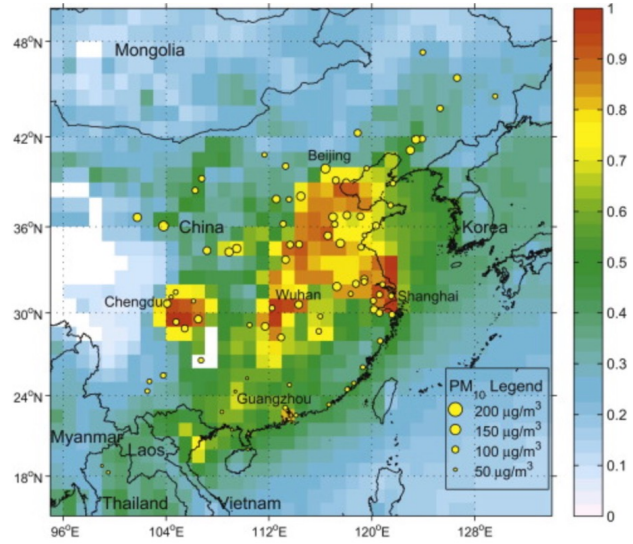
THE IMPORTANCE OF DATA

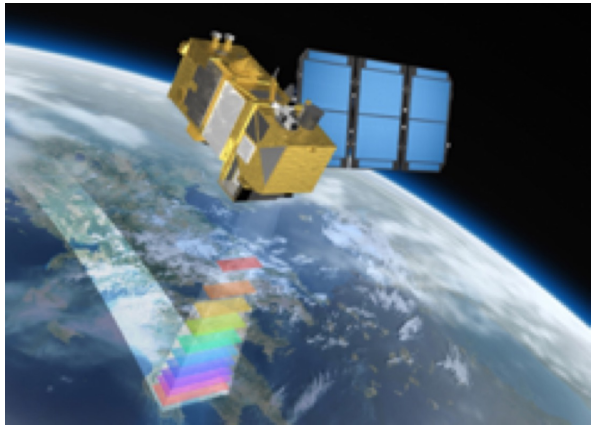
- There is a need for accurate estimates of exposure to air pollution at global, national and local levels
- Tracking progress against the Sustainable Development Goals
  - 93 environment-related SDGs indicators
  - insufficient data to assess progress for 68% (Measuring Progress, UNEP 2019)
- Data is often out of date for decision making
- Lack of disaggregated information



WHAT DATA DO WE HAVE?

- Rapid increase in number, and variety, of data sources
    - Multiple sources (national, regional, global), scales and measures / proxies
    - Different biases and uncertainties
- Data journey
    - May be using data for reasons other that those for which it was intended
- Need to able to integrate data, models and expertise



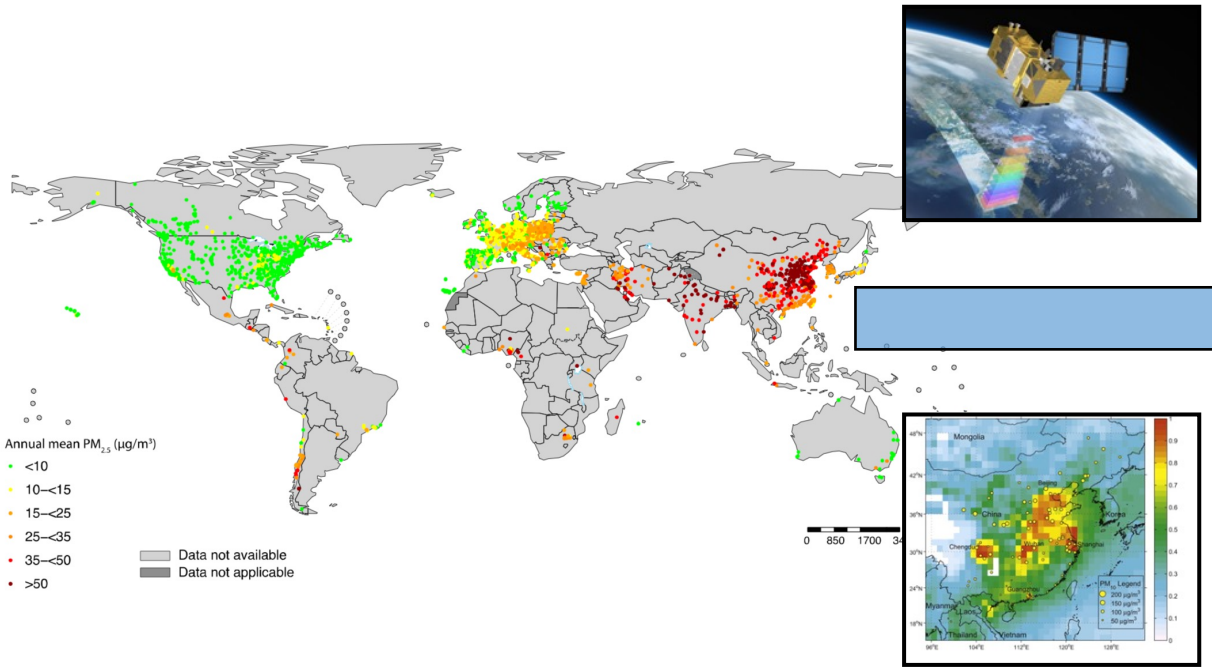


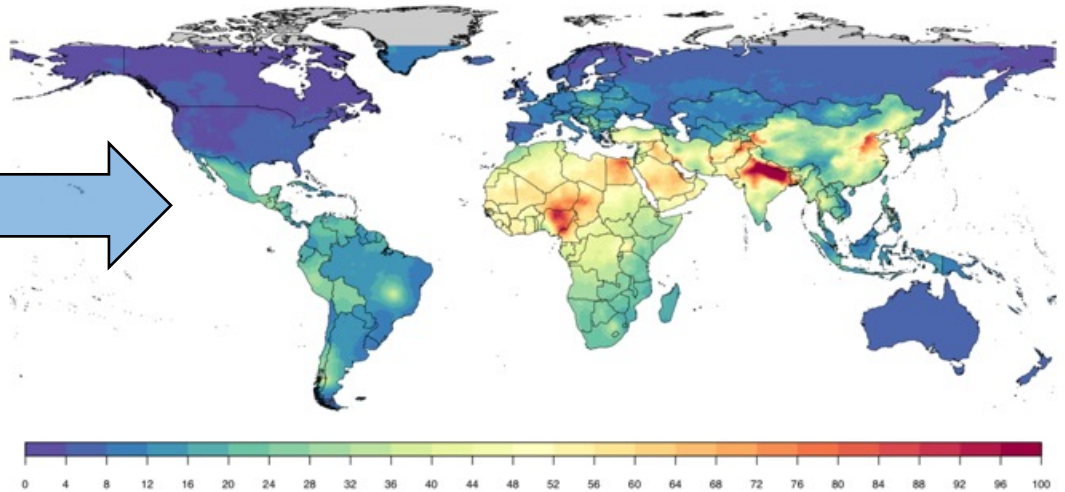
WHO DATA INTEGRATION TASKFORCE

INTER-DISCIPLINARY TEAM

- Public health, atmospheric modelling, epidemiology, statistics, data science, remote sensing, geography, communication,...
- Exeter, UBC, Health Canada, Emory, Health Effects Institute, EU Joint Research Centre, Dalhousie, WHO, North Carolina, Toronto, Copernicus Atmosphere Monitoring Service, World Meteorological Organization, …

DATA INTEGRATION MODEL FOR AIR QUALITY





11 SUSTAINABLE CITIES AND COMMUNITIES

Indicator 11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)

World Health Organization

= 4.2 million

FUTURE WORK

- Incorporate additional data sources
  - Local data and models
  - Low cost sensors
- Epidemiological studies
- Contributions from different sources
  - Anthropogenic / non-anthropogenic
- Health co-benefits of climate change mitigation