



## Air Quality and Health

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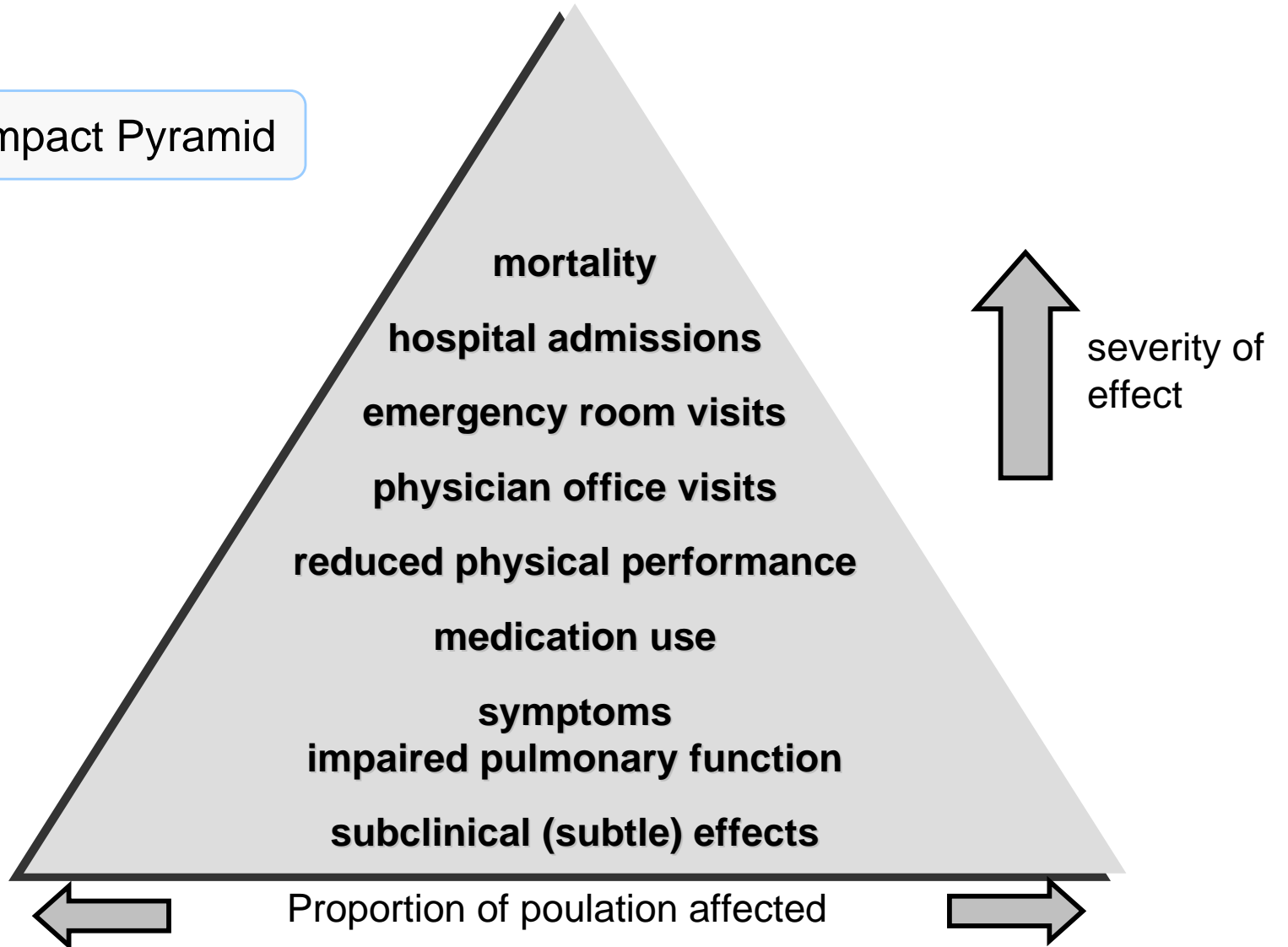


## Content

1. *Problem statement and research questions*
2. *Methodology*
3. *Contextualization*
4. *First research results*
5. *Next activities*

**Problem: Health Impact**

Health Impact Pyramid



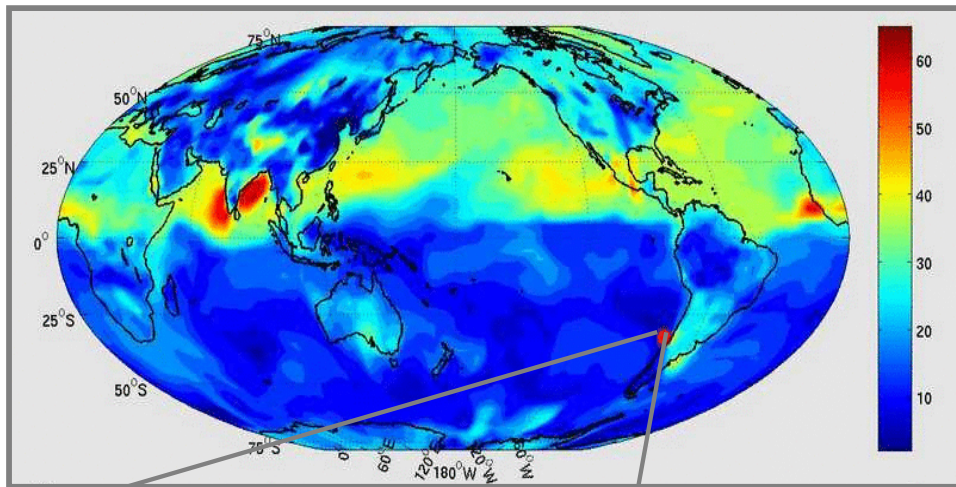
## Problem: Health Impact

Different pollutant have different impact

areas with high vs low levels of exposure		asthma & allergies	bronchitis
domestic heating attributed emissions	Leipzig	10 %	50 %
traffic attributed emissions	Leipzig	70 %	0 %
	Mendoza	120 %	30 %



## Problem: Scales

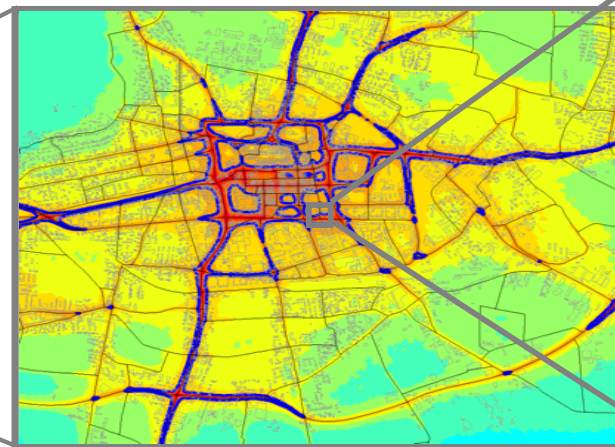
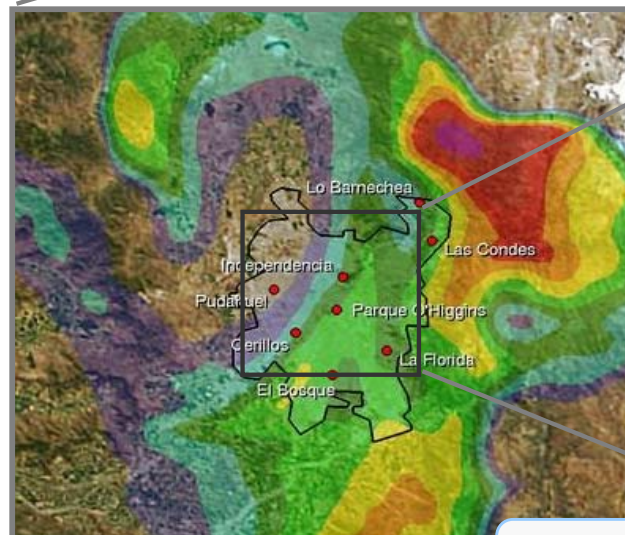


### Scales

- Global
- Regional
- Local

### Pollutants

- GHG, O<sub>3</sub>
- O<sub>3</sub>, PM<sub>2.5</sub>
- PM, NO<sub>2</sub>, CO



Models

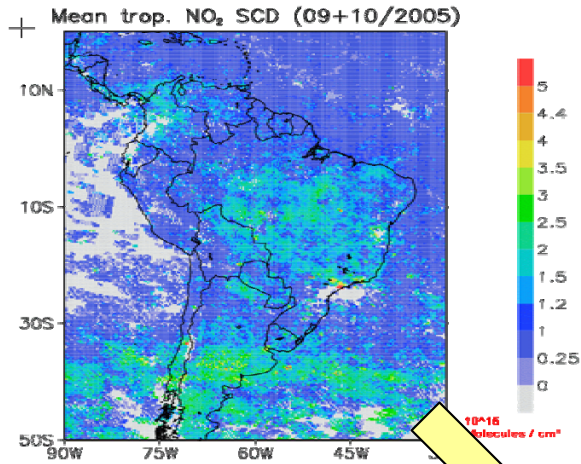
Measurements

## Research Questions

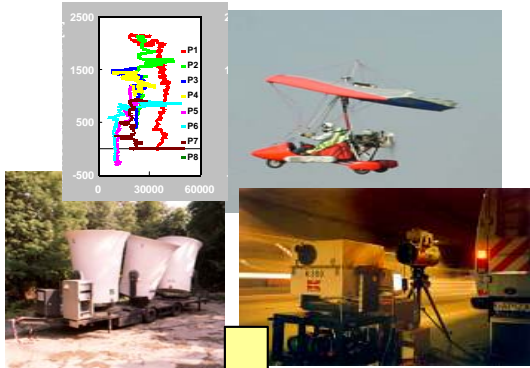
- Do we understand the complex links between emissions, air quality and health impact?
- How can suitable emission inventories for reliable air quality assessment studies be developed?
- How can separate information platforms be linked to the development of an integrated approach to air quality assessment in megacities? How can they be used for forecasting and scenario analyses?
- Which relationship exists between specific air pollutants like PM<sub>10</sub> or NO<sub>2</sub> and the appearance of environment-related diseases?
- How do traffic related and housing area data correlate to air quality and health?

# Methodology

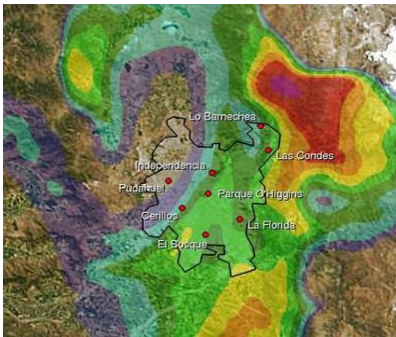
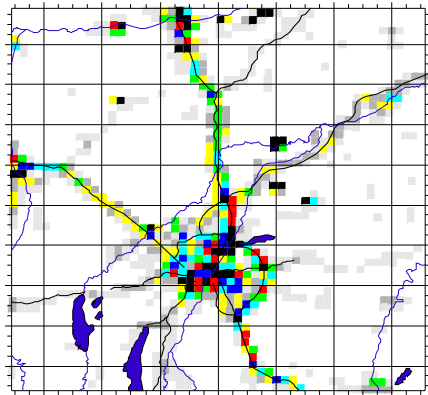
## Satellite data



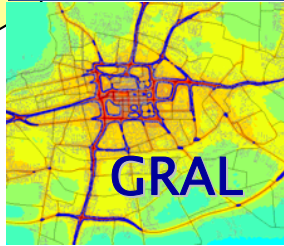
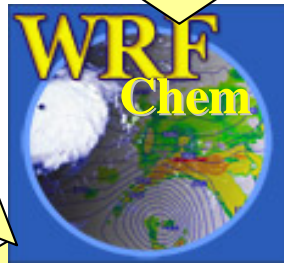
## Measurement data



## Emission data



## Air quality



## science based decision support



Stakeholders:  
e.g., communities, gov.  
agencies

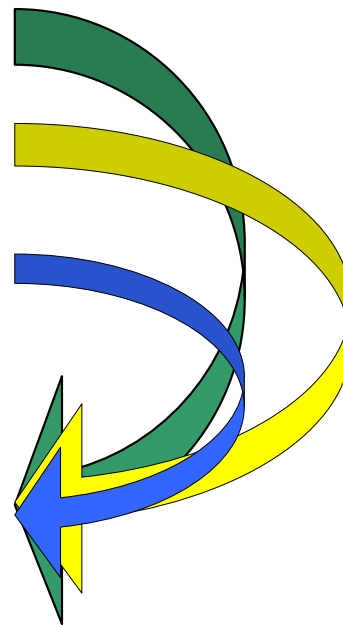
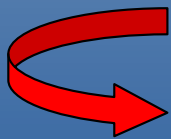
## Measures

integrated air  
quality  
assessment  
studies



## Linkages to other FoA

- Land use
- Energy
- Transportation
- Air quality
- Health

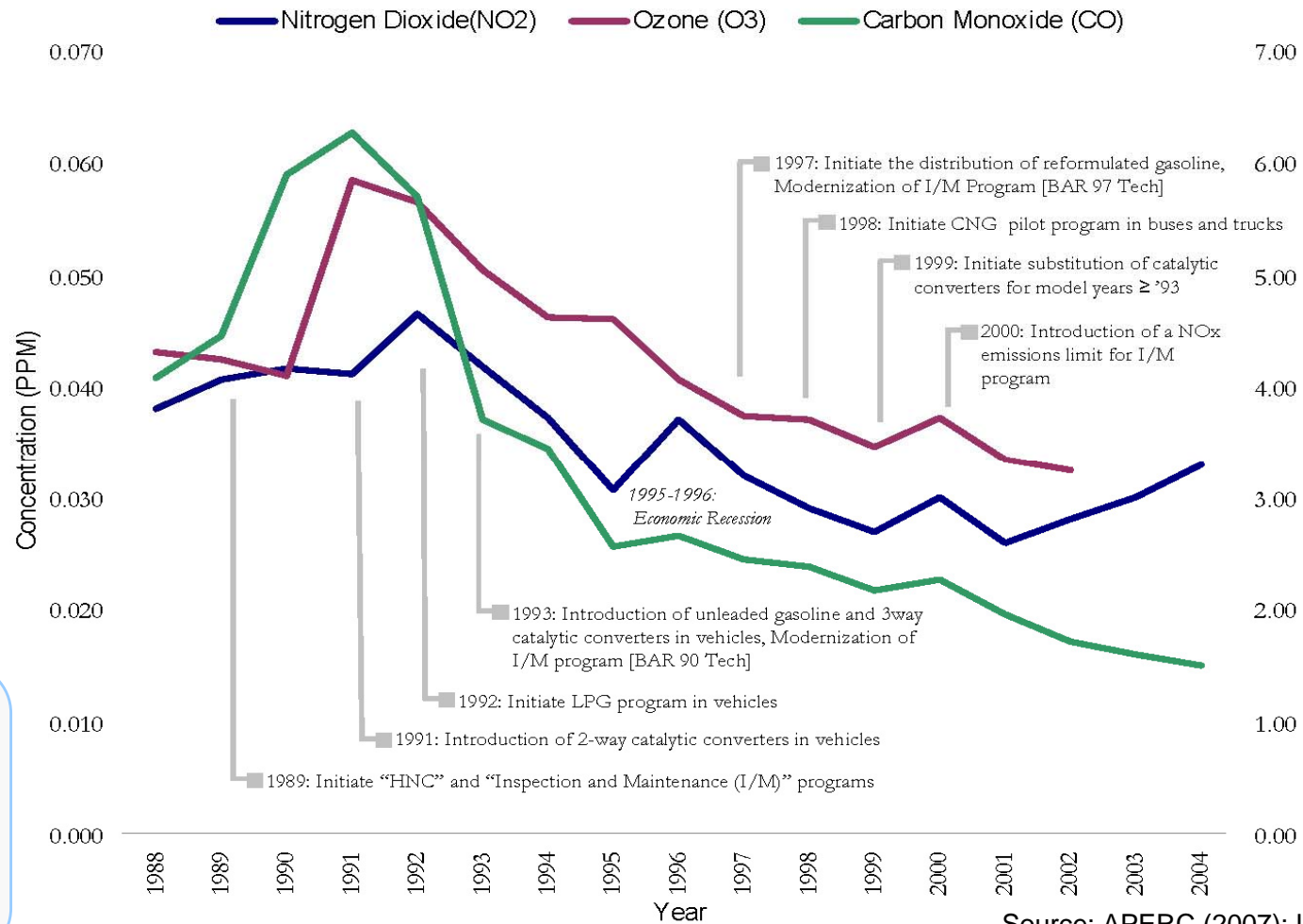


integrated approach





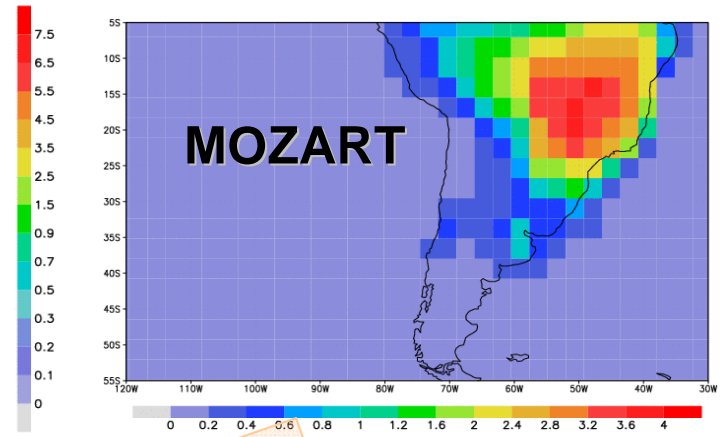
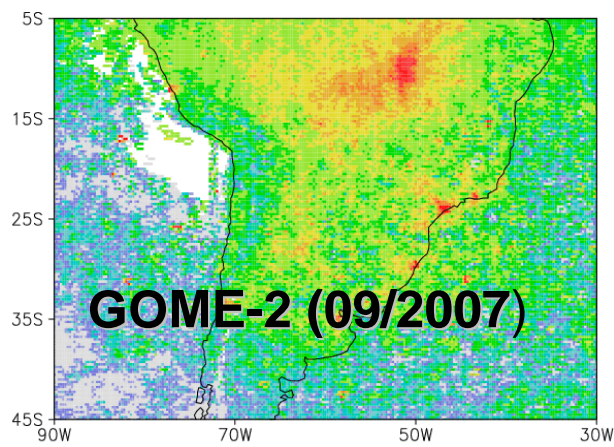
## Linkages to CCCs e.g. Governance & Sustainability



Source: APERC (2007): Urban Transport Energy Use in the APEC Regions

air Quality management policies and pollutant trends in Mexico City

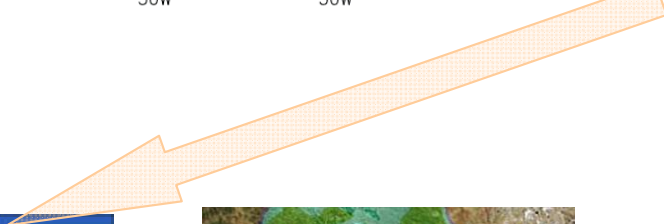
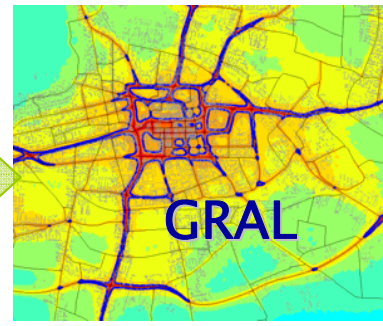
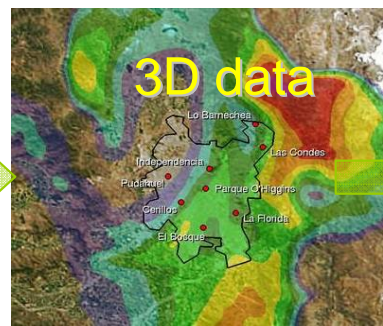
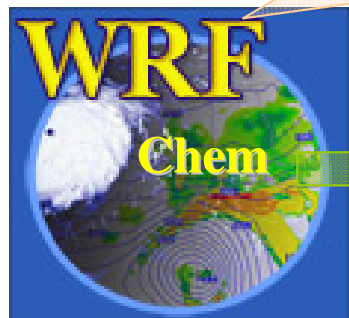
# First Results



comparison of satellite and global modal data; first examples

Coupling of global data to regional models

First steps in coupling regional and micro-scale models

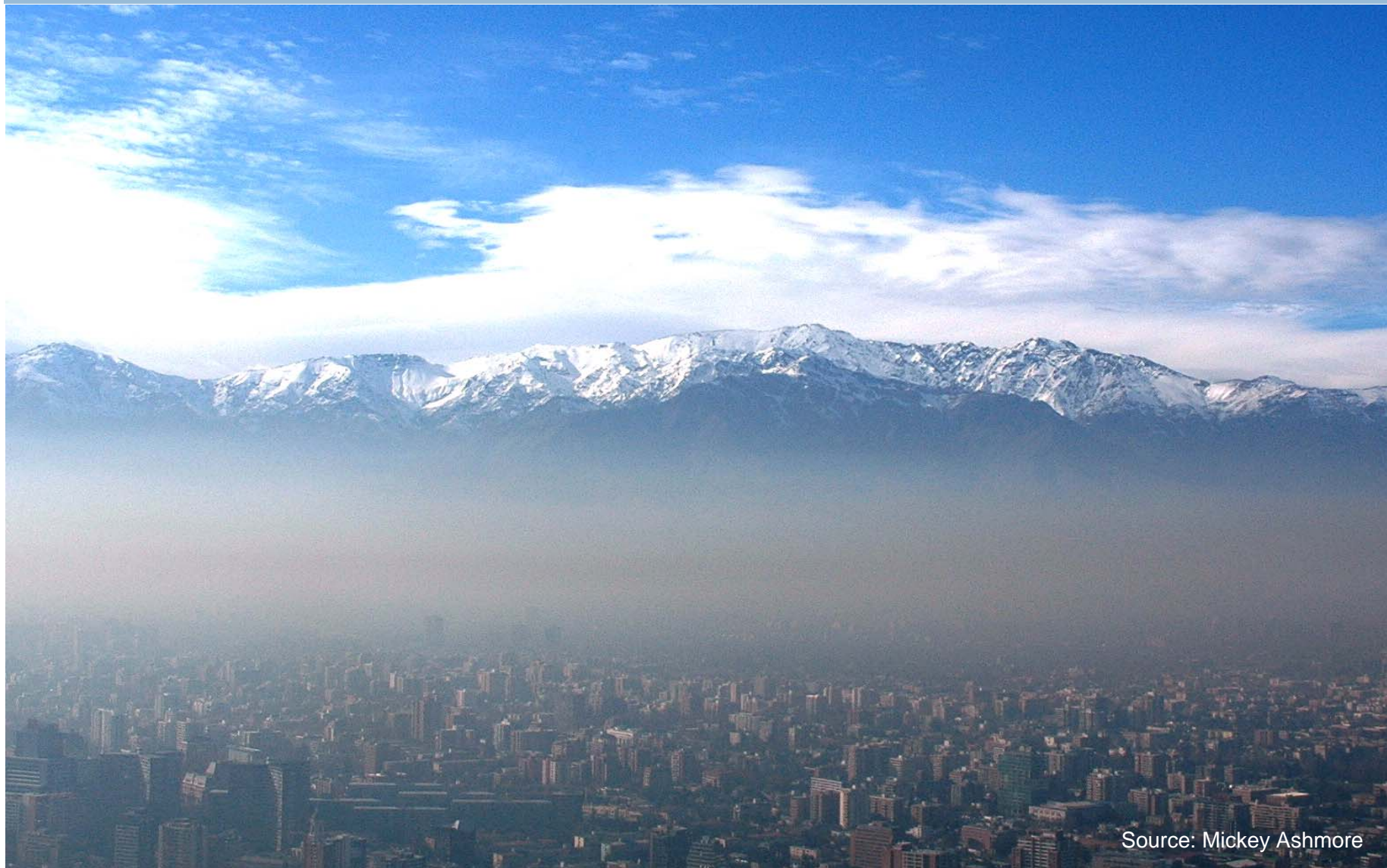


## Next Steps

- Data availability (emission inventory, health data, clinical endpoints, ...)
- Satellite information vs. global model results
- Modeling work:
  - Linking traffic emission and micro scale model
  - Implementation of a chemistry module (micro scale model)
- Evaluation of air quality measurement/monitoring data (assessment of mixing layer height)
- Preparation of measuring campaigns (Validation of MLH, chemical composition, validation of emission data,.....)
- Implementation of the ICAROS platform (hot spot selection)



**Thank you for your attention**



Source: Mickey Ashmore