Atmospheric research at city scale

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Urban research

Education

Urban atmosphere

Air quality management
- Air quality monitoring
- Emission inventories
- Smoke-haze impact

Air pollution at street level
- Personal exposure
- Public transport
- Particles characterization

Climate change
- Greenhouse gas emissions
- Carbon sequestration
- Urban heat island
OBJECTIVE

Provide a scientific base for devising new regulations to improve the air quality and climate change mitigation of Singapore and other (sub)tropical cities.

All our findings & data are publicly available

We believe in the peer-review process

Our compromise is with the society
A great team of researchers with mutual interests

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Air Quality Management

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**Review of Singapore’s air quality and greenhouse gas emissions: Current situation and opportunities**

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**National Research Foundation**

**Prime Minister’s Office**

**SINGAPORE**

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**News Reports**

Type of trees planted a factor in reducing emissions
30 November 2013

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**Diagram:**

- Max. likelihood 1-h
- Imputed 1-h (Genetic Alg. Solver)
- Min. likelihood 1-h
- 24-h moving Avg.

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**NASA EOS, 2013**

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Air pollution at street level

OBJECTIVE

Determine the characteristics of the particles to which dwellers are exposed at ground level during their daily activities.

Best locations for air quality monitoring stations at street level

Airborne particles in different transport modes of Singapore

Commuter exposure to black carbon, carbon monoxide, and noise in the mass transport khlong boats of Bangkok, Thailand

Characterization of airborne particles at bus-stops of Singapore.
Climate change – Greenhouse gas emissions

Direct measurements of CO₂ fluxes to the atmosphere at local scale

Eddy covariance flux tower

CO₂ flux partitioning at Telok Kurau, Singapore
Climate change – carbon sequestration

Carbon uptake by photosynthesis

Biogenic flux = (vegetation) + (soil)

Soil respiration
Climate change – urban climatology

Energy balance

Urban heat island
Education

Education is the key to clean the environment

- Seminars, lectures & courses
- Thesis coordination
- Summer internships
- Students’ competitions
Take home message:

Air quality is an issue, even in Singapore. And not only during smoke-haze events.