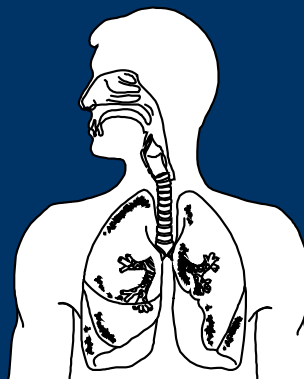


# Assessing human exposure to air pollution in health assessment studies in Europe

Ole Hertel, DSc, PhD, MSc & EBA

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Department of Environmental Science, Aarhus Uni.

Adjunct Professor, ENSPAC, Roskilde University

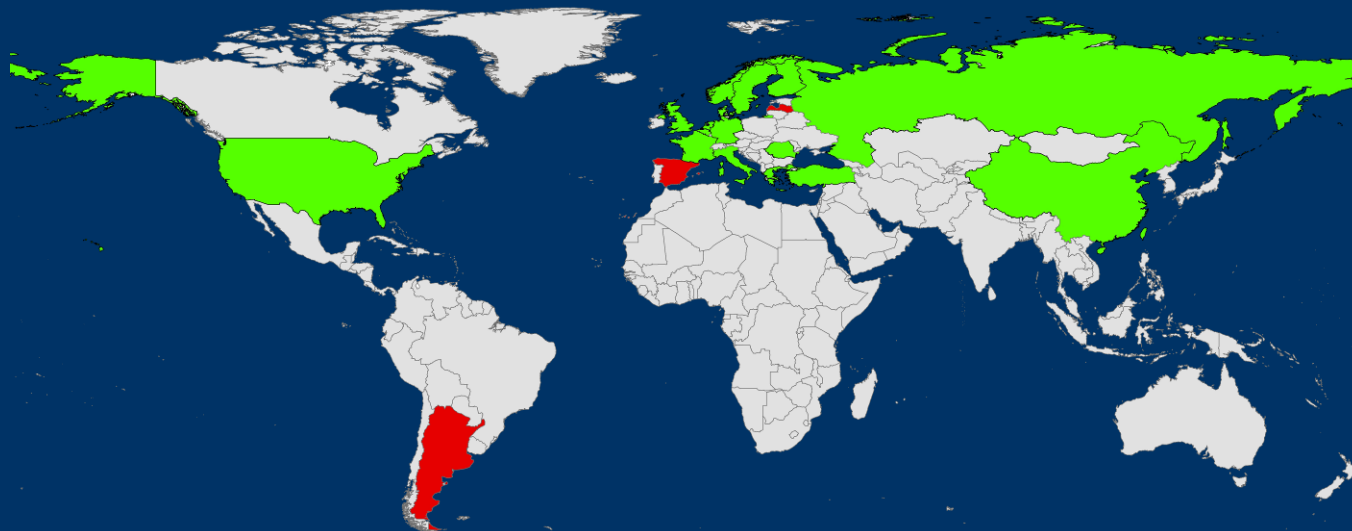


COST TD1105 workshop at ENEA 4-6 December 2012

# Negative Health effects in Denmark

- Oxidative damage 6 hours CPH air (Bräuner et al., 2007)
- Filtered air & heart funct. elderly (Bräuner et al., 2007)
- Wheeze in COPSAC children (Andersen et al., 2005)
- Oxidative damage cord blood (Pedersen et al., 2009)
- Stroke & air pollution (Andersen et al., 2009)
- Lung cancer (Raaschou-Nielsen et al., 2010) 2-300/yr
- Leukaemia, Radon & Air pollution (Brauner et al., 2010)
- Asthma admission COPSAC (Iskandar et al., 2012)
- diabetes (Andersen et al., 2012)

# Countries using OSPM

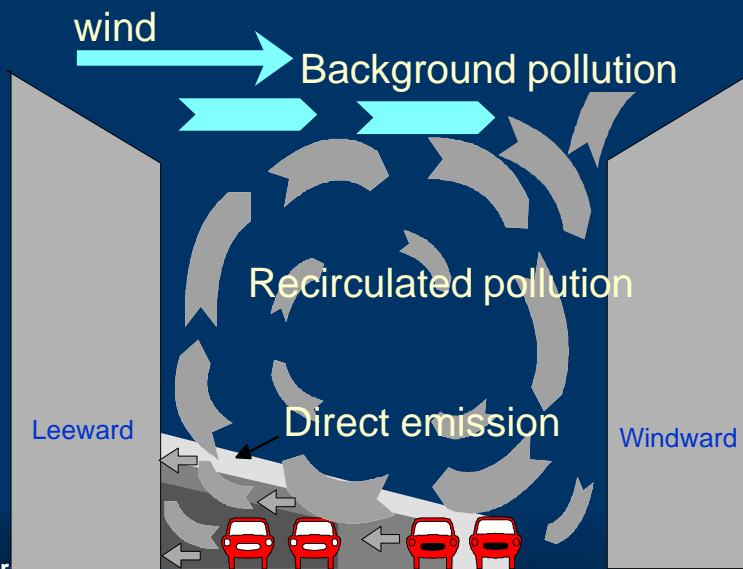


## Published studies:

- Denmark
- Sweden
- Norway
- Finland
- Germany
- United Kingdom
- Turkey
- France
- Russia
- Greece
- China
- Belgium
- The Netherlands
- USA
- Italy
- Romania
- Vietnam

## and model license:

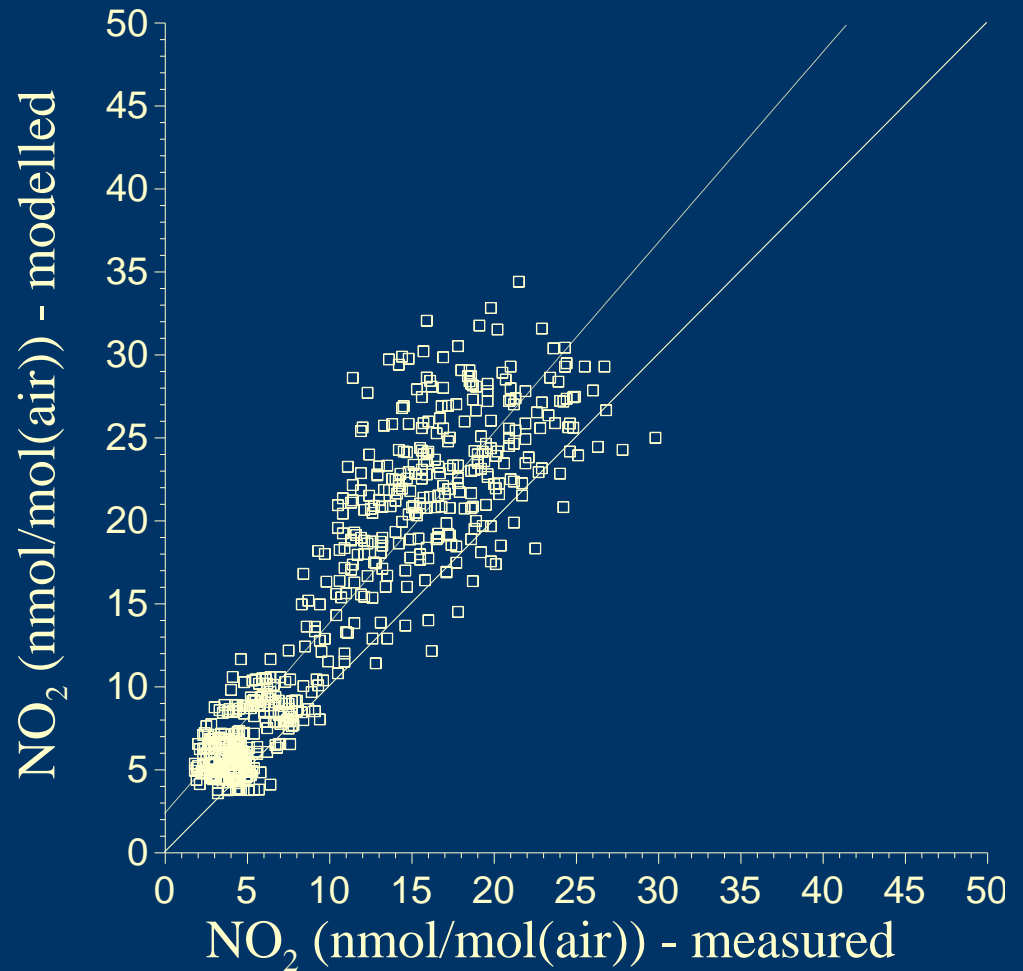
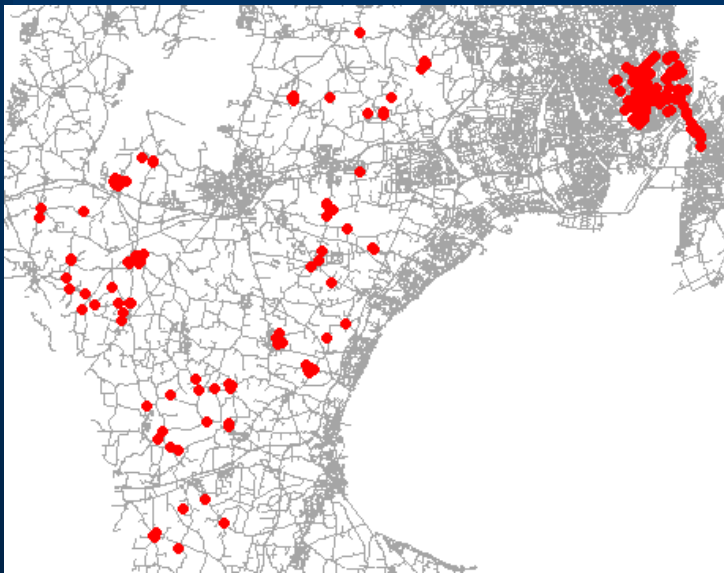
- Latvia
- Spain
- Argentina
- Taiwan
- Cyprus
- Qatar



<http://ospm.dmu.dk>

# The Children cancer project

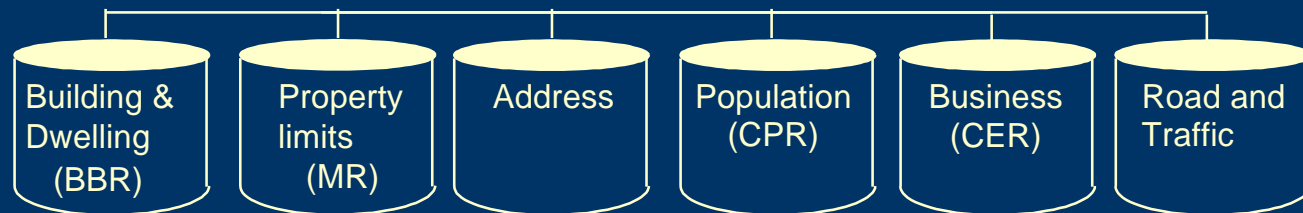
Six month NO<sub>2</sub> measurements at the 200 sites. 14 days passive samples (Palm tubes)



# The AirGIS system

Determination of street configuration data from digital maps & databases:

1. Building height
2. Building height in sectors
3. Average height of buildings
4. Distance building facade to road centre line
5. Street orientation
6. Width of carriageway

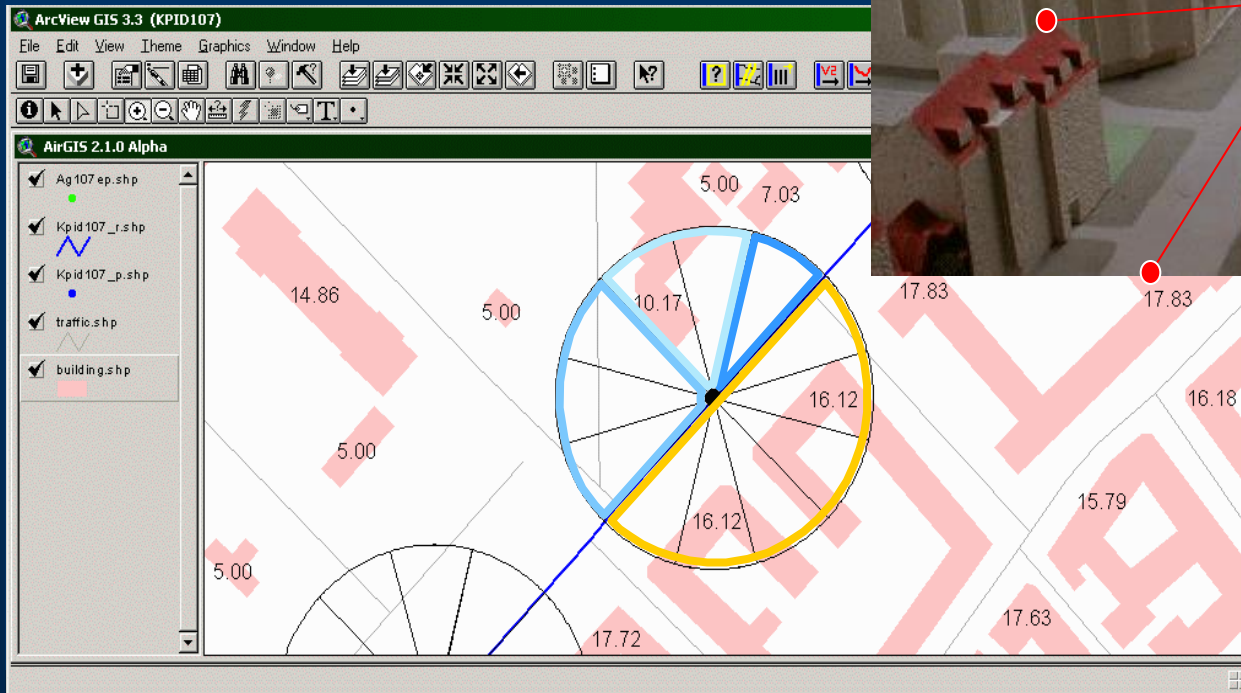
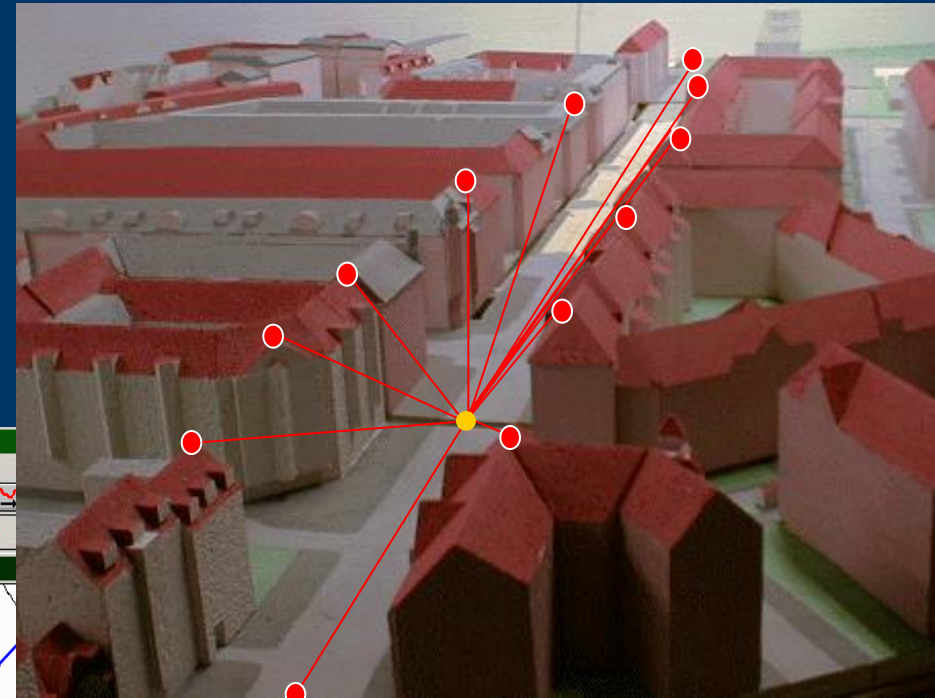


National and local databases

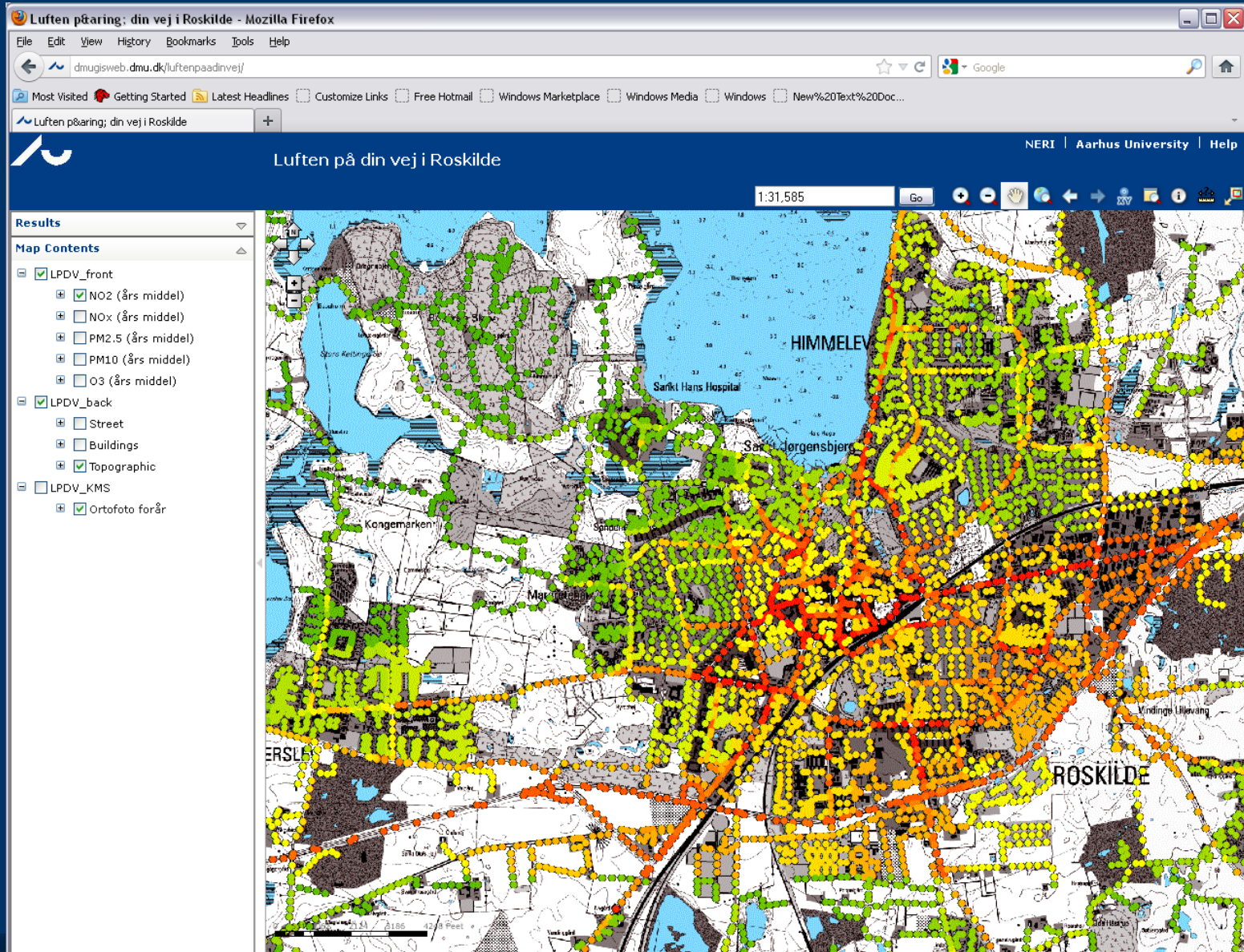


# AirGIS automatic generation street configuration

Performed calculations for the entire nutrition, cancer, health cohort of 50.000 people & 200.000 addresses

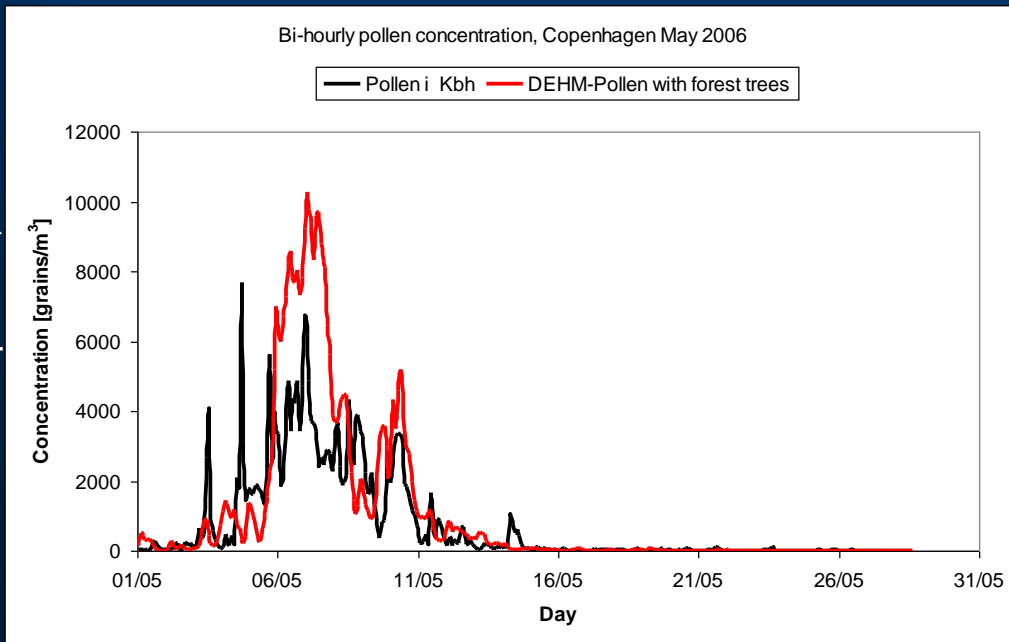


# Mapping address level exposure in Danish city

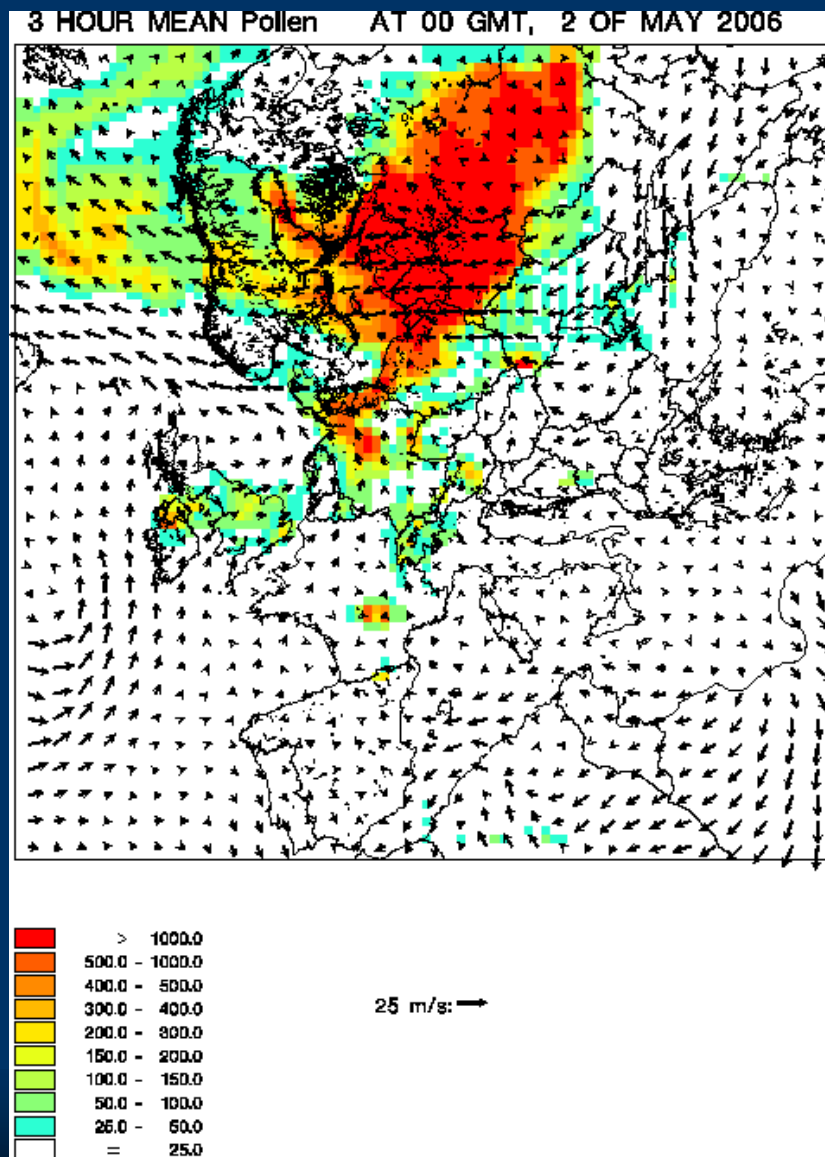




# Betula on continental scale



Modelling long-range transport of birch pollen with DEHM-Pollen



[8] Skjøth (2009) Integrating measurements, phenological models and atmospheric models in Aerobiology - PhD

Department of Environmental Science, Aarhus University

thesis.



*1) What are the health effects of various air pollutants & airborne allergens in DK?*

*2) Do simultaneous environmental exposures result in synergistic negative health effects?*

- smoke from domestic wood stoves,
- allergenic pollen from trees, grasses & new invasive species)
- airborne allergenic material (skin tissue, hair etc) released from livestock
- fungal spores from agriculture and other sectors,
- airborne PM natural sources (sea spray, soil dust)
- long-range transported organic & inorganic PM incl. agricultural emissions
- pesticides applied in DK farming
- Radon & EMF in domestic buildings

# Exposure assessment

- Various exposure windows - short & long term exposure
- Address based - coupled to traffic exposure from previous works
- Exposure when commuting e.g. between home and work
- Using selected cohorts
- Using full country population
- Currently working on mapping address exposure entire population

# Journalist course, EEA, CPH, Jan 2012

- Member of Scientific Committee at EEA
- Arrange journalist course in January
- Aim to get better environmental journalism
- Use personal exposure monitors in Copenhagen streets and discuss results

