

# European Network on New Sensing Technologies for Air Pollution Control and Environmental Sustainability - *EuNetAir*

COST Action TD1105

## Final Meeting at PRAGUE (CZ), 5-7 October 2016

### *New Sensing Technologies for Air Quality Monitoring*

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## Air Quality Modelling in Latvia: Recent Updating



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Latvia

 **cost**  
EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY



# Background

Almost in all European countries air quality models are used for regulatory purposes;

- issuing emission permits,
- cases studies for environmental impact assessment,
- analysis of future development and planning.

# Until now ... and in future

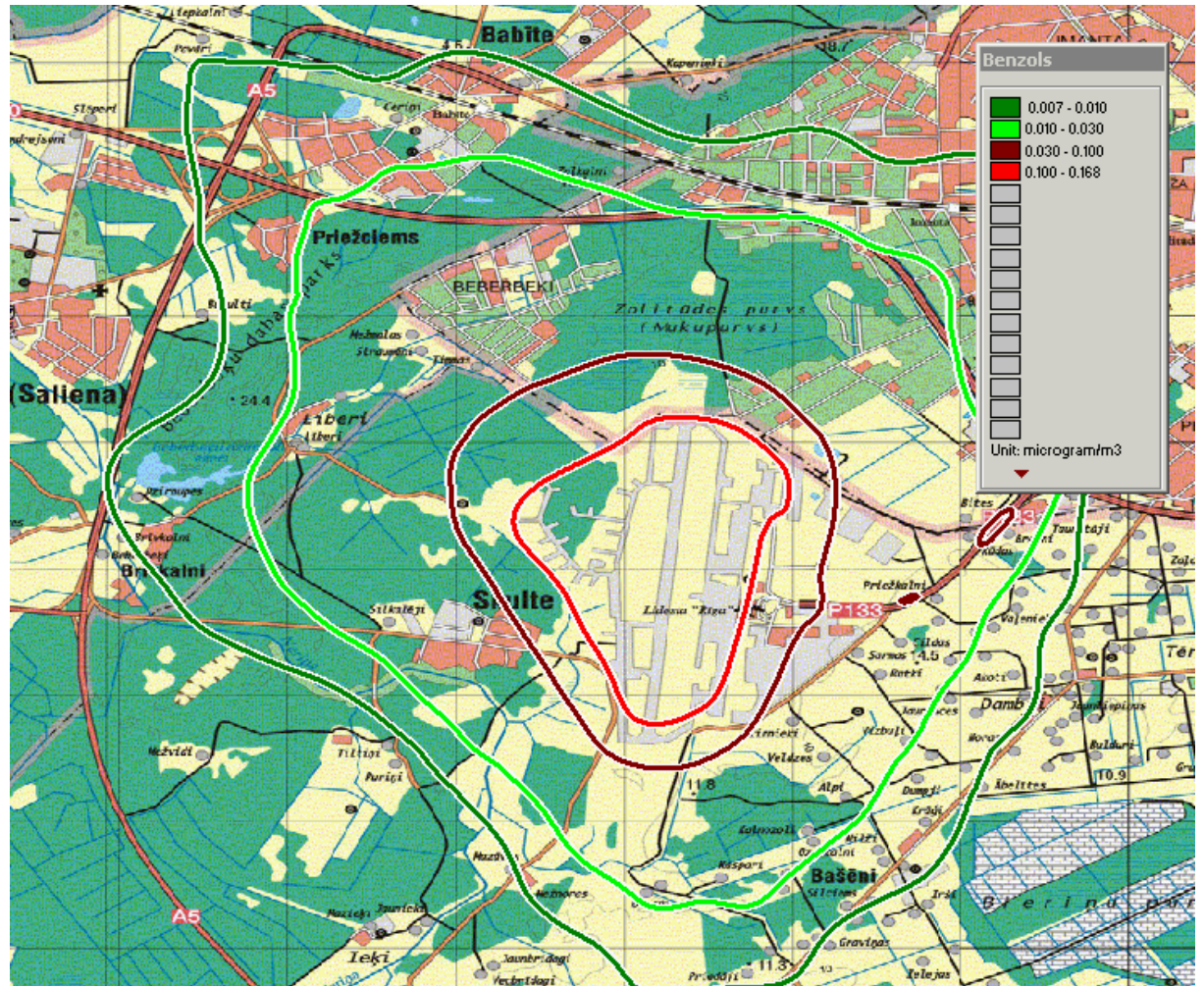
## AQM are used for different spatial and temporal scales

- **Air quality permits (for industry with varying number and type of sources)**
- **AQ planning (at city level, impact of specific restrictions for traffic flows, individual heating systems)**
- **Research (dispersion in street canyons, traffic lights planning, micrometeorology, industrial risk assessment, critical loads on ecosystems, odour dispersion, ...)**

# Issuing of air quality permits

## Example of Riga Airport AQM (31 substances & 24 sources)

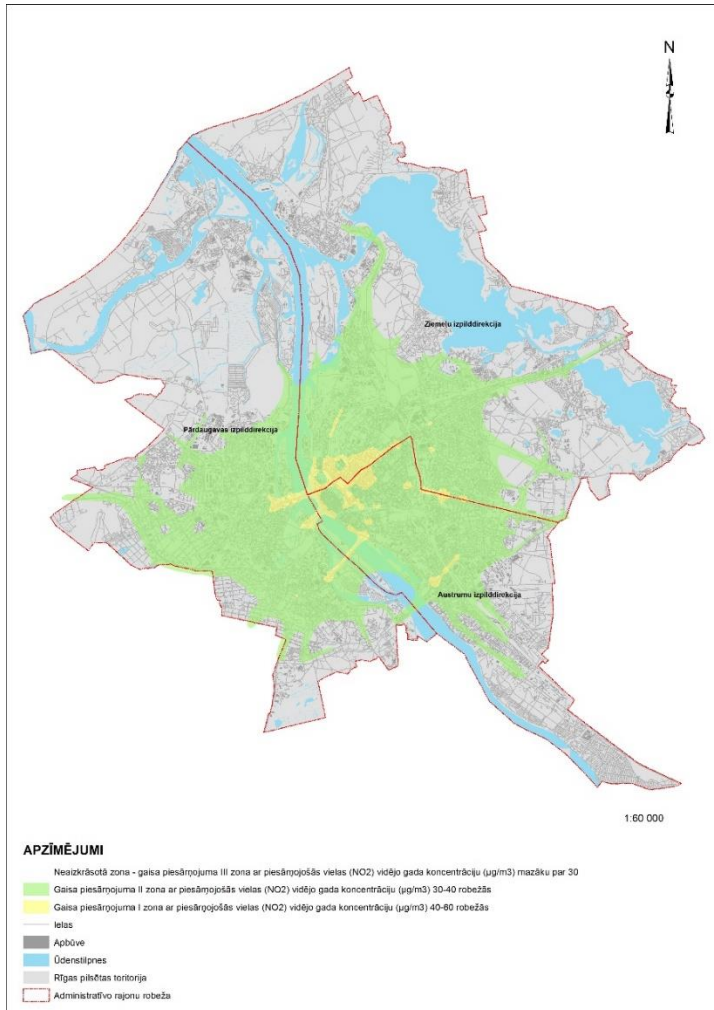
More often request on coupled modelling (air quality + noise propagation) is requested.



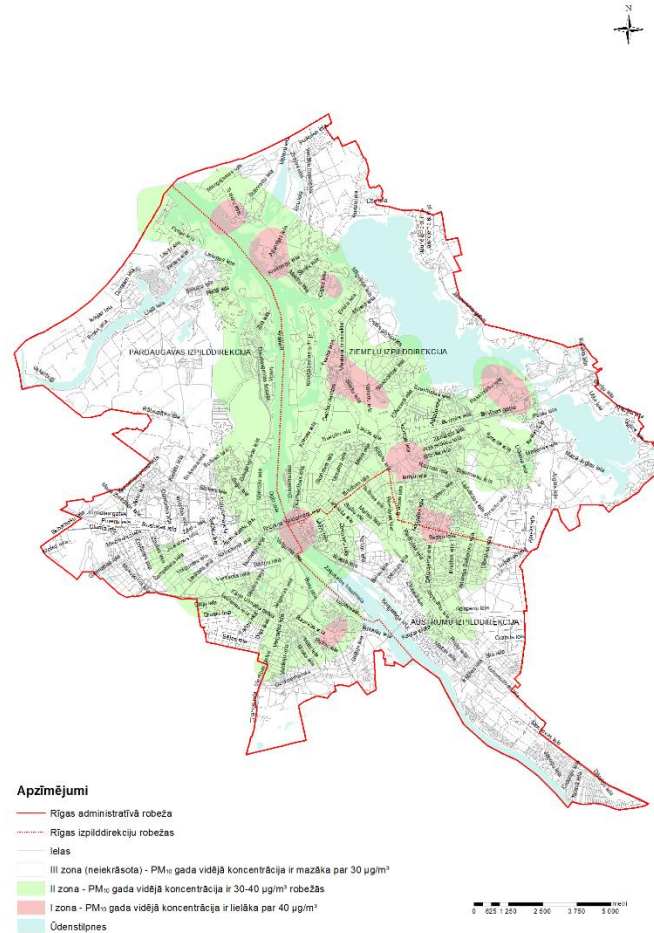
# AQ planning

(at city level, impact of specific restrictions for traffic flows, individual heating systems)

## NO2 pollution zoning

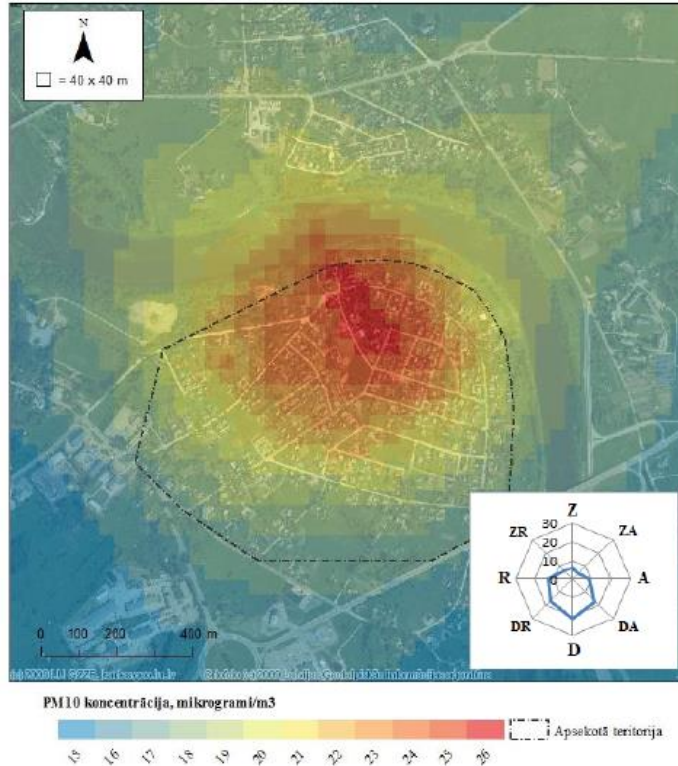


## PM10 pollution zoning

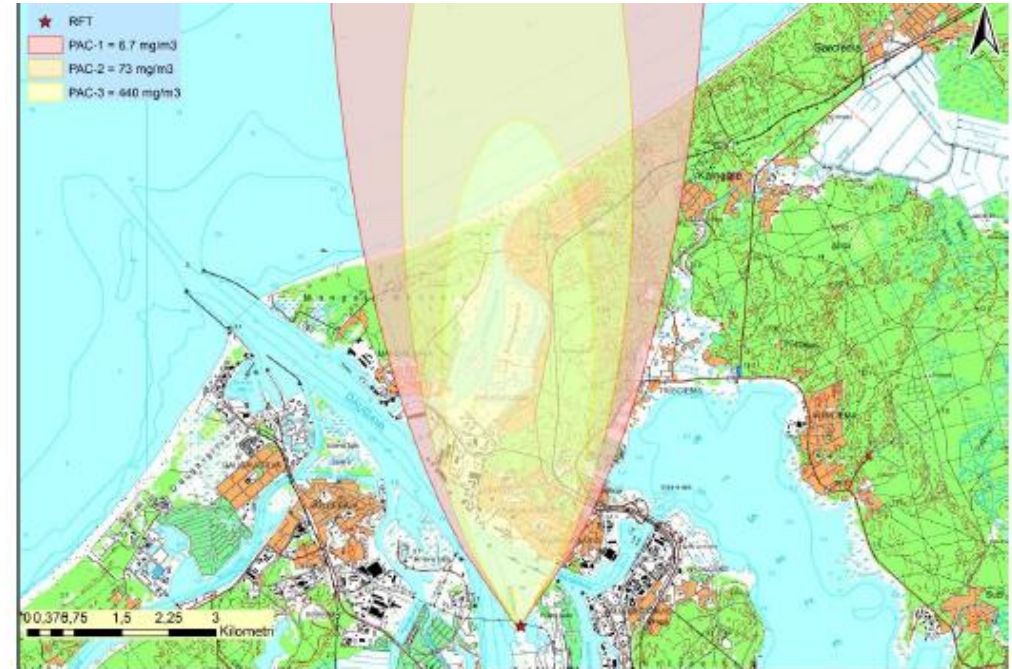


# Research

(industrial risk assessment, critical loads on ecosystems, ... )

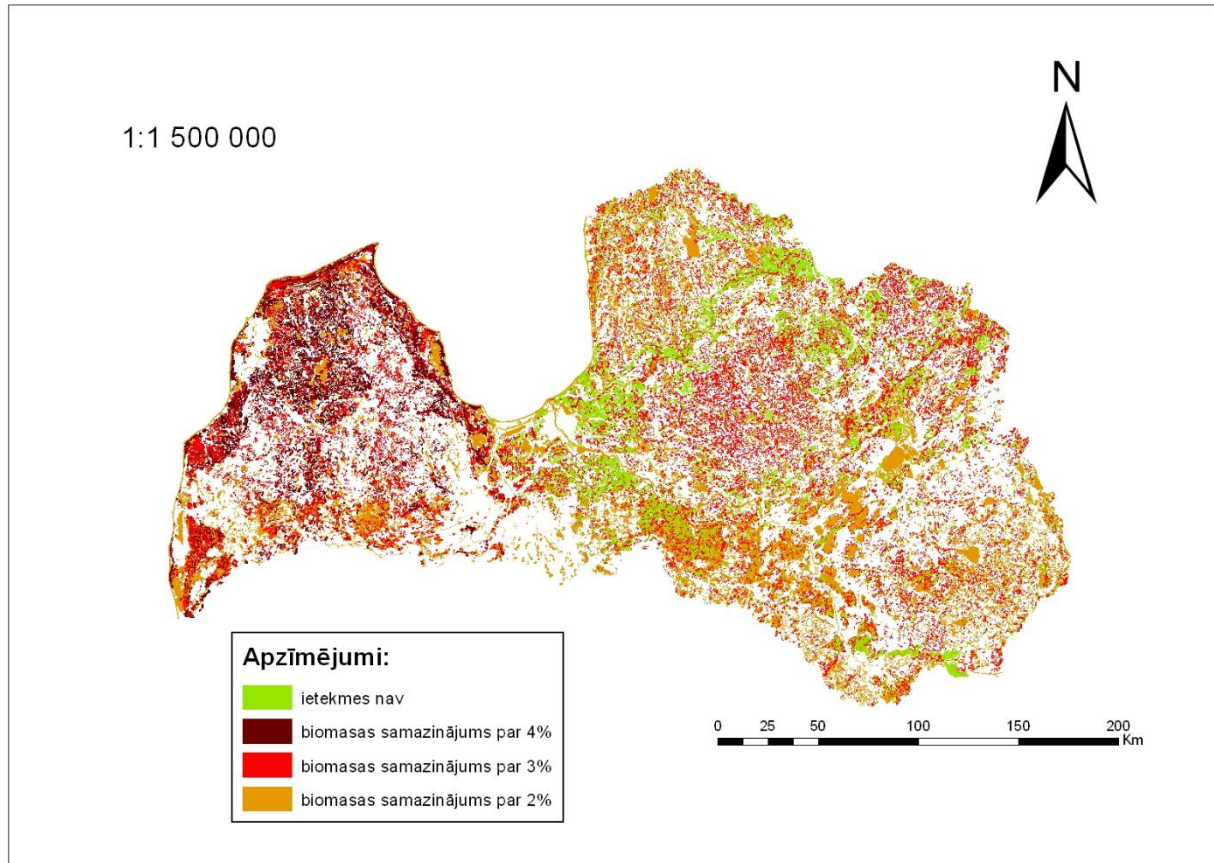


PM10 annual concentrations,  
impact of individual heating  
systems in small city  
(about 12 000 inhabitants)



Dispersion of fertilizer (NH<sub>3</sub>NO<sub>3</sub>) particles  
after breakdown of handling storage in  
Riga Fertilizer Terminal

# Critical loads on ecosystems

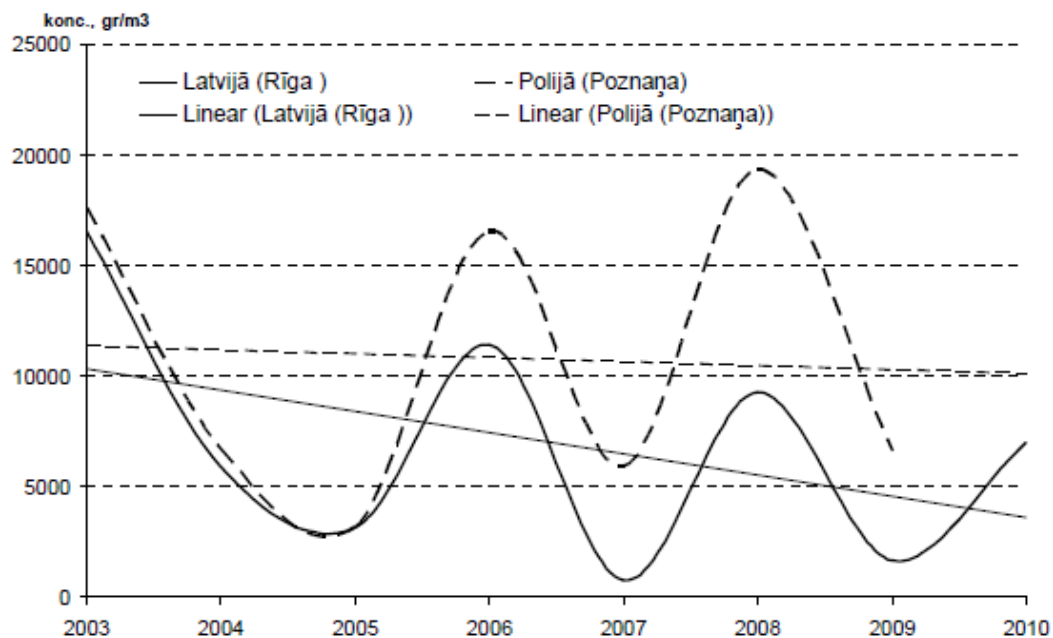


Exceedances of ground level ozone phytotoxic dose on forest ecosystems

# Pollen forecasts

There are about 35-47 different pollen types observed every year.

The high-allergenic pollen for Latvia comes

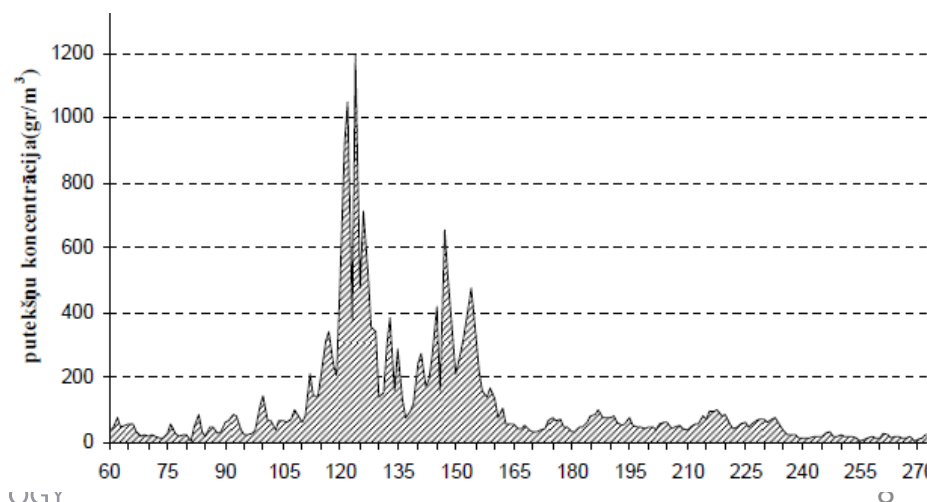


*Urtica* Mill.),  
*Betula* L.),  
*Corylus* L.),  
 s (*Poaceae*)  
 rt (*Artemisia* L.).

ollen season, which starts in March  
 n September, is divided I - IV



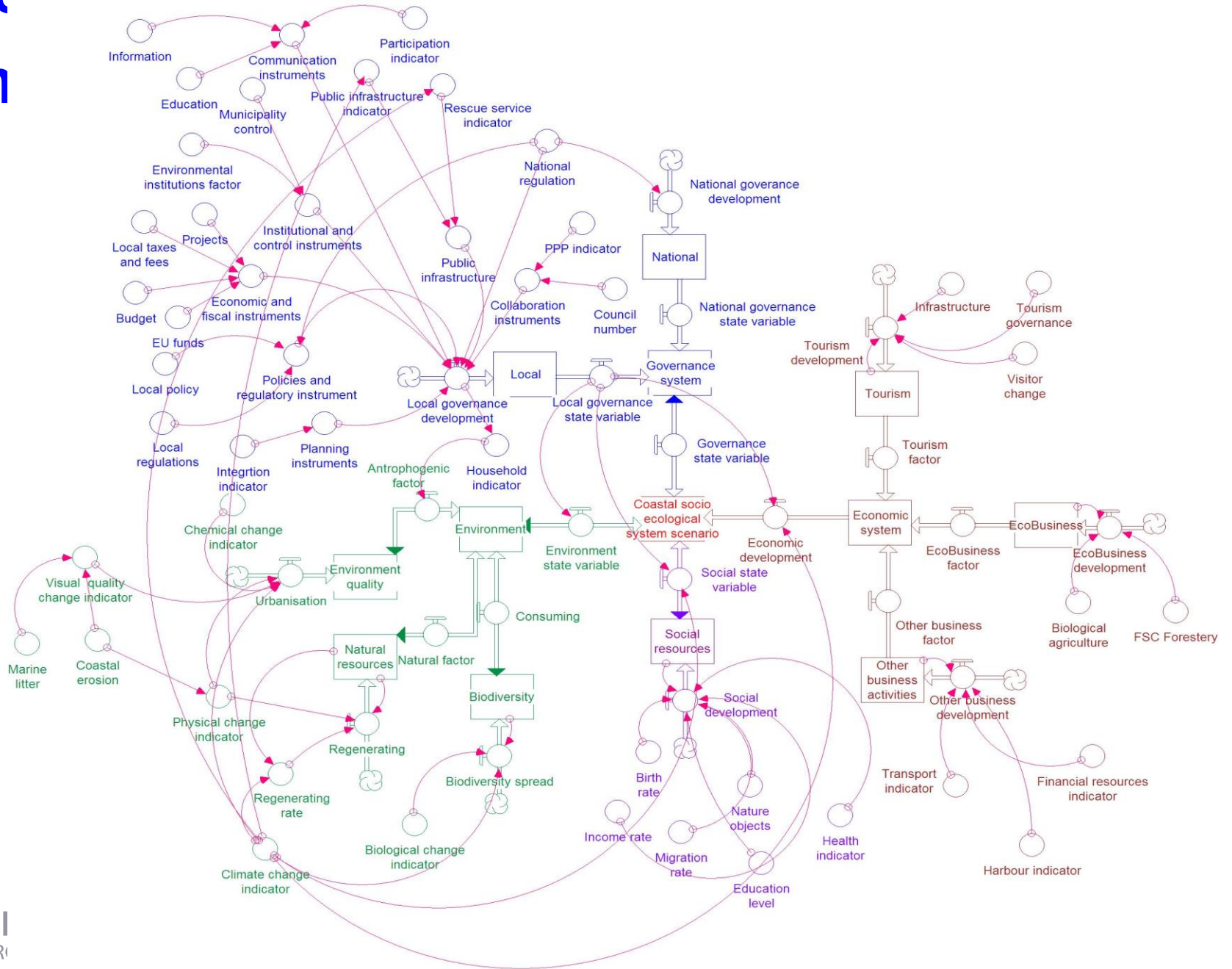
Burkard volumetric pollen –  
 spore trap at the monitoring  
 site





# Another dimension of $\Delta QM$ –

## System



# Sick Building Syndrome

... a condition affecting office workers, typically marked by headaches and respiratory problems, attributed to unhealthy or stressful factors in the working environment such as poor ventilation.

## Measurements for modelling

CO<sub>2</sub>, VOCs, PM, microclimate, noise, illumination, status of ventilation system, fungi and spores, EMS

## Places

- modern «smart» buildings;
- old, but renovated buildings (schools, kindergartens)
- old buildings

# Future work



- Complex modelling & forecasting
- Validation of modelling results – reference methods + sensors
- Sick Building Syndrome research

# Acknowledgements

- ... to my colleagues  
& partners (Occupational  
Health Institute; Laboratory of  
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- COST TD1105  
Action

