Real practice is not a drill!

A case study on the participation of all classes in a running research project

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1th International Week, February 2 – 5, 2015
• Classical analytical laboratory (chemistry lab)
• Instrumental measurements (North Transdanubian Regional Environmental Protection and Nature Conservation Inspectorate)
• Biology, microbiology lab
• Noise measurement (field work)
• Ecology field practice (5 days in the woods)
• Visitations at sewage plants, waste management sites, factories
• PRACTICAL (min. 6 weeks)
Goals:
• Optimising urban traffic to minimize ambient air pollution

Modelling steps:
• Traffic model (VISUM, VISSIM)
• Emission from traffic (Coppert model)
• Diffusion model (FLUENT)
• Validation (monitoring data, field measurements)
Structure of the Air Pollution Model

Traffic Simulation

Emission Model

FLUENT

Traffic Data

3D Geometry

Measured Concentrations

http://www.innoteka.hu/cikk/varosi_kozlekedes_iranyitasa_mso_eszkozokkel.1050.html
• capture daily profile
• fine scale spatial resolution, canyon study
Methods

- Manual traffic counting
- Noise measurement
- Local wind (speed, direction), temperature

Air sample
• „Street Canyon” – Szent István út – Jókai út, Győr

• 2*8 sampling sites (1.5 m & 3m)
• 6 air samples during the day
• 18 hours manual traffic counting
• 3 lecturers and 40+ students involved
„Street Canyon” – Szent István út – Jókai út, Győr

- 2*8 sampling sites (1.5 m & 3m)
- 6 air samples during the day
- 18 hours manual traffic counting
- 3 lecturers and 40+ students involved
Results

Measured daily pollution

NOx($\mu g/m^3$)

Date: 04/02/2015
- Measurements in Győr at 2 different districts

- 14 sampling sites (1.5 m)
- 6 air samples during the day
- 18 hours manual traffic counting at 3 cross-sections
- 3 lecturers and 40+ students involved
Along Szent István Road

![Graph showing emissions and traffic flow along Szent István Road.](image)
Campaign 2014/1
„Street Canyon”

- 13 sampling sites
- 6 air samples/day
- 18 hs manual traffic counting
- 3 lecturers and 40+ students
Campaign 2014/2

- 2 main roads
- 1 roundabout
- 2 control points
- 13 sampling sites
- 6 air samples/day
- 18 hs manual traffic counting
- 3 lecturers and 40+ students
Results
Deviations from Monitoring Data

- Mean (P10, P11, P12)
- Győr2
- All vehicles

NOx (μg/m³)
Number of vehicles
Time (h)
• Project days – no classroom lessons
• Participation as in parts of courses
  – Air pollution
  – Noise
  – Ecology
• Schedules
  – Traffic counters
  – Pumpers
  – Noise investigators
• Facebook group
• Supervisors
Conclusions

Difficulties
• Long shift (5 to 23)
• Early morning
• Weather
• Several scenes
• Some under-motivated students

Profits
• Precise work
• Understanding of serious measurement
• Robust practice
• Problem solving
• Many volunteering
• Positive attitude
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