The M-database –
A multi-disciplinary and scientific data platform

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How do we know where we are? How can we find the way from one place to another? And how can we store this information in such a way that we can immediately find the way the next time we trace the same path? This year’s Nobel Laureates have discovered a positioning system, an “inner GPS” in the brain that makes it possible to orient ourselves in space, demonstrating a cellular basis for higher cognitive function.

The M-database is both a product and a research project at Lund University and Malmö University in Sweden.

The main purpose of the project is to construct a sustainable platform for geospatial data-intensive research and education within and outside the universities (Malmö University and Lund University in Sweden).

One of the main challenges has been to find maintainable structures for data collecting, editing and data sharing.
Background

How the M-database came about

Large scale production of geographical data: Quantity enables

However

Supply dispersed, data quality issues

Inspire Infrastructure for Spatial Information in Europe

Make geodata streamlined and accessible

Lund & Malmö University
Scattered data collection
Duplicating data

Solution

Construction of M-database
Accessible and sustainable platform
Challenges
How the M-database expanded

Outside the universities:
Similar problems:
Scattered data supply and collection

Consequently:
The M-database expanded from researchers to civil servants.

Beneficial at first:
Entry to internal datasets and key members of staff

Eventually: Introduced several challenges:
• Privacy
• Objectives, how to serve the public
• Collaboration
• Agreement
What does the M-database contain?

- 800 features
- Topographic data
- Census data on administrative levels
- Incident data on coordinate level
- Data collected through fieldwork
Process

How the M-database was constructed

Data collected from stakeholders

Adjusting and selecting

Geocoding and transformation into geodata file
Different objectives

Data supply

Supply public with information

Quality assurance

Analyze crime patterns spatially

Shared problems

Analyze fire patterns

STAKEHOLDERS → RESEARCHERS

Malmö stad
Malmö city council

The local police

The local emergency services

RESEARCHERS ← STAKEHOLDERS
Mutually beneficial data sharing?

- Ownership
- Privacy & confidentiality
- Usage
- Storage
- Public access
- Administrative problems
Conclusions and future work

From research project (in itself) to stable platform for research and education

Shift from a static working environment to an ArcGIS server platform.

Education:
- ArcGIS desktop
- ArcGIS online

Three related research projects:
1. Incendiary fires and social processes
2. Residential fires in metropolitan areas - spatial differences and fire safety work in the socially fragmented city
3. Urbandata2decide
Patterns of intentional fires determined by different living conditions and different exposure to socio-economic stressors.

Fires used as a conflict practice primarily targeted against the police.

Factors as high proportion of children and young people, overcrowding, low level of education and high informal population growth are important structural causes behind intentional fires.

Different preventive measures include improving living conditions, fire safety, focusing on specific social risk groups or individuals that may be potential fire setters.
ArcGIS Server Platform
*Shift from a static working environment to an ArcGIS server platform*

Malmö stad
Malmö city council

The local police

The local emergency services

Supplementary stakeholders

Web Portal
ArcGIS Online

M-DATABASE
ArcSDE

ArcGIS Server
Online material and services

RÄDDNINGSTJÄNSTEN SYD
Research project 2: Residential fires in metropolitan areas - spatial differences and fire safety work in the socially fragmented city

Project aim:
To analyze underlying determinants of structural fires in metropolitan areas.

Method:
Analyzing fire statistics in relation to spatial, physical and demographic (socio-economic) variables.

Collaboration with the emergency services, local authorities and other stakeholders in the metropolitan areas!

Research questions:
- Why are there differences in the number of fires between metropolitan areas in Sweden?
- Are there differences between different types of fires in the cities of Malmö, Gothenburg and Stockholm?
Research project 2

Demonstration 1: Residential fires in metropolitan areas
Research project 3

*UrbanData2Decide*

*UrbanData2Decide:*
An interdisciplinary collaboration between social science universities, IT universities and research institutes in Europe

*Project objective:*
Aims to develop new methods to combine existing big data pools and expert knowledge into one optimal framework to support local governments towards a holistic decision making process

*Investigation of relevant stakeholders case:*
Recurring conference call hosted by a local police chief every Friday for relevant stakeholders that are active in his jurisdiction.
Research project 3
Demonstration 2: UrbanData2Decide