Experiences from 20 years of agricultural catchment monitoring

Factors influencing data quality

Catchment M36 in south-west Sweden (March 2007)
Monitoring in small agricultural catchments in Sweden

1988  County Boards started monitoring

1993  Swedish EPA sets up a guideline for a regional monitoring program

1995  Swedish EPA starts a national data hostage

2002  Eight catchments were transferred to a national program

2007  Three of the regional catchments were transferred to demonstration catchments
The monitoring program

*The catchments*

- serve as indicators of how agriculture responds to subsidies, regulations, advices and market within the agricultural sector
- are used for verification of models such as those included in national load calculations

*The national program*

- Water quality in streams and groundwater
- Pesticides (4 of 8 catchments)
- Water discharge, precipitation, temperature
- Annual field management inventory
- Soil characteristics
Overview - Factors influencing data quality

In monitoring

• Measuring methods/data collection
• Data storage
• “Social factors”

In assessment

• The models used
• Natural conditions, time perspective, diversity within catchments
Measuring methods/data collection

Changes and uncertainties in

• Sampling methods/equipment for e.g.
  - water discharge measurements
  - water sampling
  - weather data
  - field management data for arable fields

• Laboratory standards/equipment

• Quality assurance activities
Data storage

*Databases may be old-structured and not well-designed for*

• Changes in type of data and new kinds of data
• Storage of quality parameters and meta-data for each value
• More “soft” data as comments and field observations
• Linkage of GIS-layers and data
"Social factors"

• The annual collection of field management data relies on a good relation between the interviewer and the farmer even if questionnaires are well-designed and farmers are paid for participate.

• Field personnel must be enough skilled so they can observe and document unusual things in the measurements.
Assessment of data

**Time:**
Large variations in losses due to weather variations may hide the effects of agricultural practices

**Diversity:**
Each catchment is unique according to combination of soil type, climate, ground water regime, farmtypes, point sources....

**Natural conditions:**
The anthropogenic contribution to total losses may vary largely between catchments due to natural characteristics

*When evaluating data, there is a risk that uncertainties in separate datasets add up and together become larger than, for example, calculated effects of changes in agricultural practices*
Conclusion

To handle that we have known and unknown uncertainties

we need

• well-structured dynamic databases that can store, besides the data, also detailed information on the methods used
• quality assurance systems that are easy to use

By having documented as complete information as possible the potential for accurate assessment of data increases