

Experiences from 20 years of agricultural catchment monitoring

Factors influencing data quality



Catchment M36 in south-west Sweden (March 2007)

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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

6 (9)

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”

7 (9)

- 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

8 (9)

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 antropogenic 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

