Seasonal Balancing

Early examples from local scale dealing with scarcity

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TopSoil II
AquaModul-online

Dachverband Feldberegnung Uelzen

Landwirtschaftskammer Niedersachsen

TOPSOIL Interreg North Sea Region TOPSOIL

GE 4 (Uelzen) Triple Monitoring

Aim:
Protection of local groundwater dependent ecosystems sensitive to local groundwater abstraction

Method:
Identify the interdependencies with the help of parallel monitoring of
- upper and lower groundwater aquifer,
- sensitive small watercourses‘ run off

and combine it with
- rainfall
- and local abstraction quantities data

for identifikation of critical local wells
respectively
for change of **groundwater abstraction patterns**
(sites, quantities, periods)

GE 4 (Uelzen) Triple Monitoring

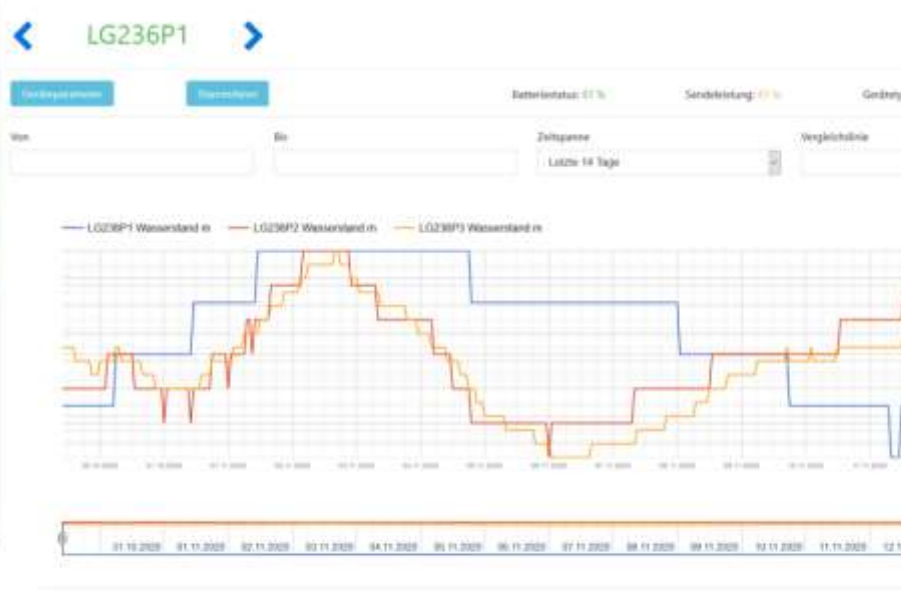
Activities and Results since April:

- Additional (= 4th) site for triple monitoring found
  => suburban setting
  with even 3 monitored
  aquifers

- 4 th ADCP- Sensor for flow measuring not yet installed

- remote data transfer at wells
  in function

- remote data transfer for
  ADCPs not delivered yet
  (due to Corona)



Seasonal Balancing

1. short term balancing (days)

A. retention of rainfalls in the **soil**

=> capacity strongly varying => depending on soiltype and its thickness („fieldcapacity“)

Methods:

- „conserving tillage“ = no turn over of soil by plough => in the future largely impossible because of planned end of Glyphosate

- removal of artifical drainage
  => waterlogging of fields = plants‘ death

- „intelligent drainage“ => practical functioning missing

- lift water level in discharge system

1. short term balancing (days)

B. retention of run off in **surface waterbodies**

Methods: artificial installations

- non controllable (rock slide)
  => not fit for wet seasons => inundations
- controllable (weirs)
  => in conflict with continousity of riverbed (WFD)

Seasonal Balancing

2. Long term balancing (seasons)

=> **collect** water **for later use**

Methods: Store in

- in surface polders
- in biotops
- in groundwater aquifers

2. Long term balancing (seasons)
=> **collect** water **for later use**

Problem: which source ?

- high waters
  - „waste“water
    - drainage water


Foto: Enercity AG


pictures: Landwirtschaftska


Foto: J.Martens, DFU

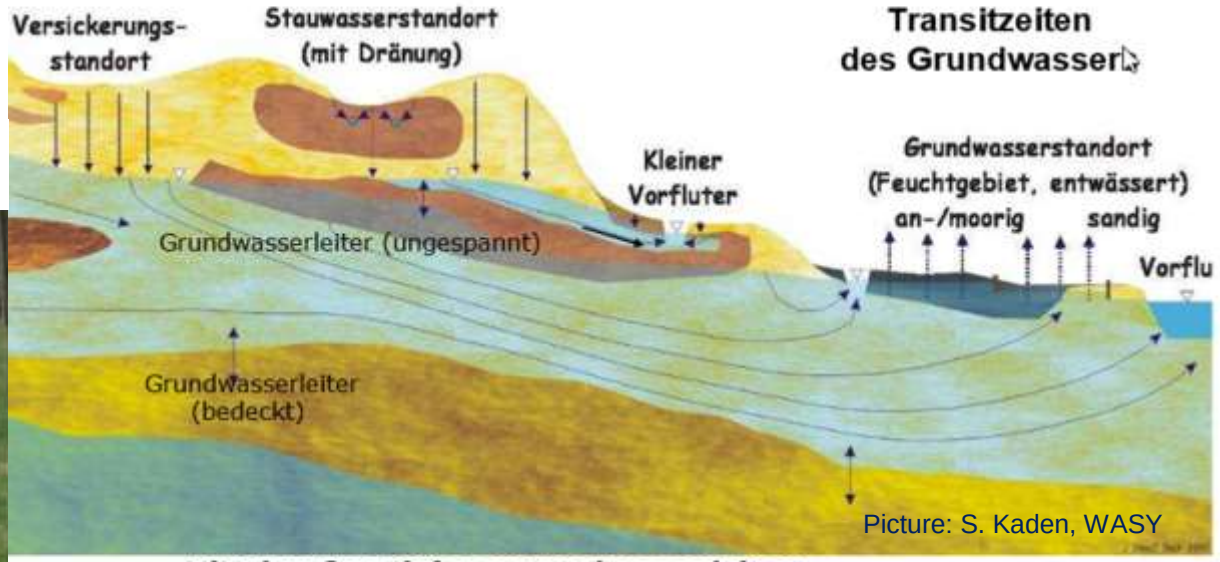
2. Long term balancing

Method:
How is your hydrogeology?

Who profits?
(Who pays?)

Foto: R. Claassens, KVwaBo Lücow-Dannenberg

Kleiner, oberflächennaher Grundwasserleiter
- Fliessweg durch den Grundwasserleiter bis 5 km
- Fliessgeschwindigkeit im Sand ca. 1 m pro Tag
ca. 3 Jahre Sickerweg + ca. 10-15 Jahre im Grundwasser



Picture: S. Kaden, WASY

Mittelgroßer, tieferer Grundwasserleiter:
- Fliessweg durch den Grundwasserleiter bis 10-20 km
- Fliessgeschwindigkeit im Sand ca. 10 cm pro Tag
ca. 5-7 Jahre Sickerweg + ca. 250 bis 500 Jahre im Grundwasser

Seasonal Balancing

2. Long term balancing (seasons)
   => **collect** high waters **for later use**

<= Natural waterproofing

Pictures: Landwirtschaftskammer Uelzen

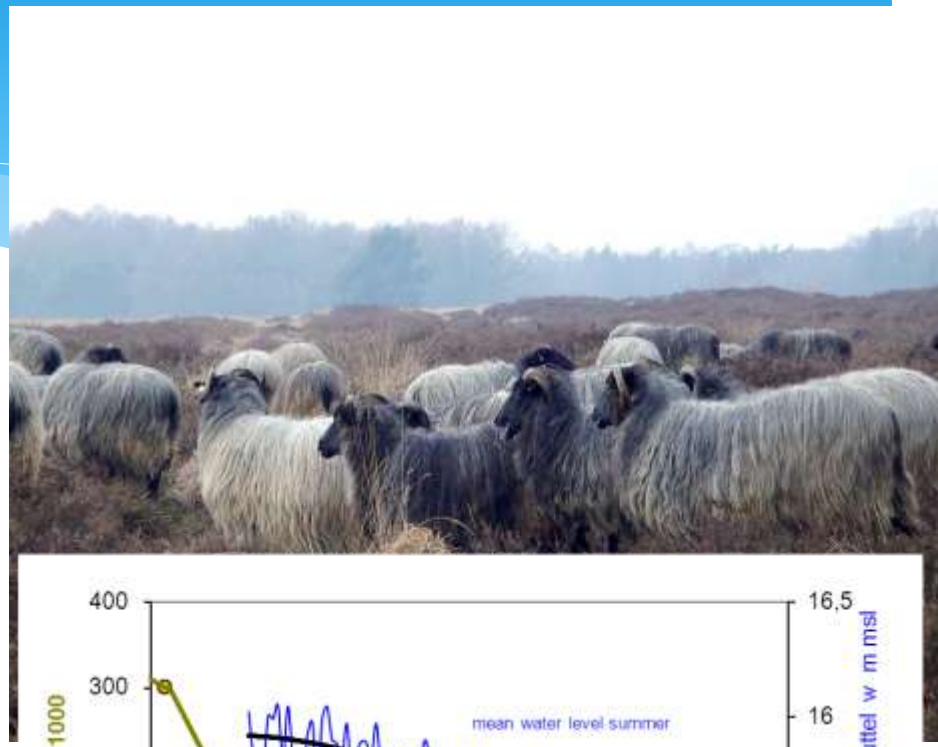
Extra: Just in time - Balancing

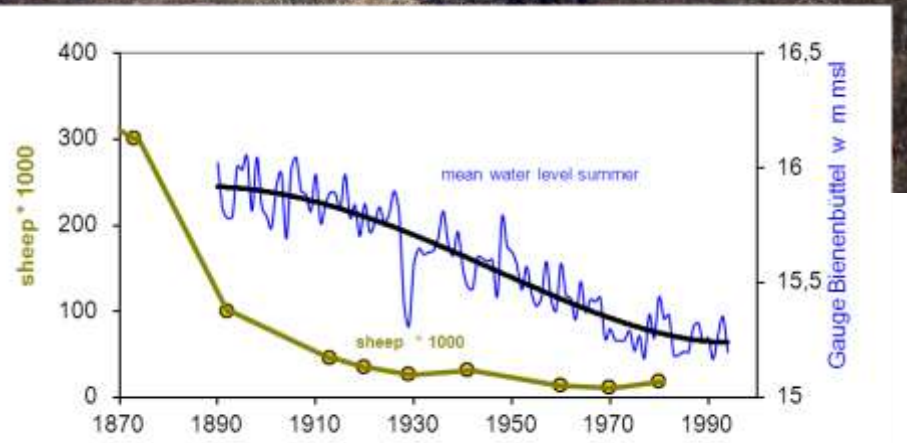
Active Balancing

3. General increase of GW-quantity

increase of recharge by different landuse

(e.g. change of coniferous forests to decidous forests in upstream area)

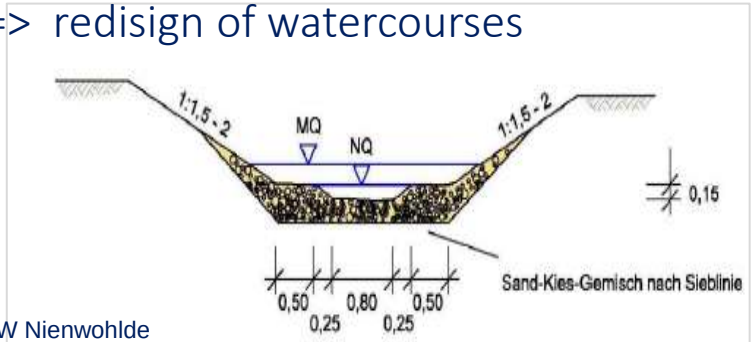




Pictures: H. Wittenberg

4. Cure effects of water scarcity

=> redisign of watercourses



Picture: BOEW Nienwohlde

Seasonal Balancing

2. Long term balancing (seasons) => collect for later use

Further aspects:

- **watershortage usually shows in upstream areas**

  => but: upstream natural watercourses are yet little => little quantative potential

- waterquality? (wastewater reuse!)

- Investment costs => expensive technical outfit for infiltration sites, water proof storage, …

- running costs: artificial (upstream) pumping => very high energy consumption

- who pays, if it is not profitable (for the immediate user!)?

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Thank you for your attention!

Foto: R. Claaßens, KVWaBo Lüchow-Dannenberg

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