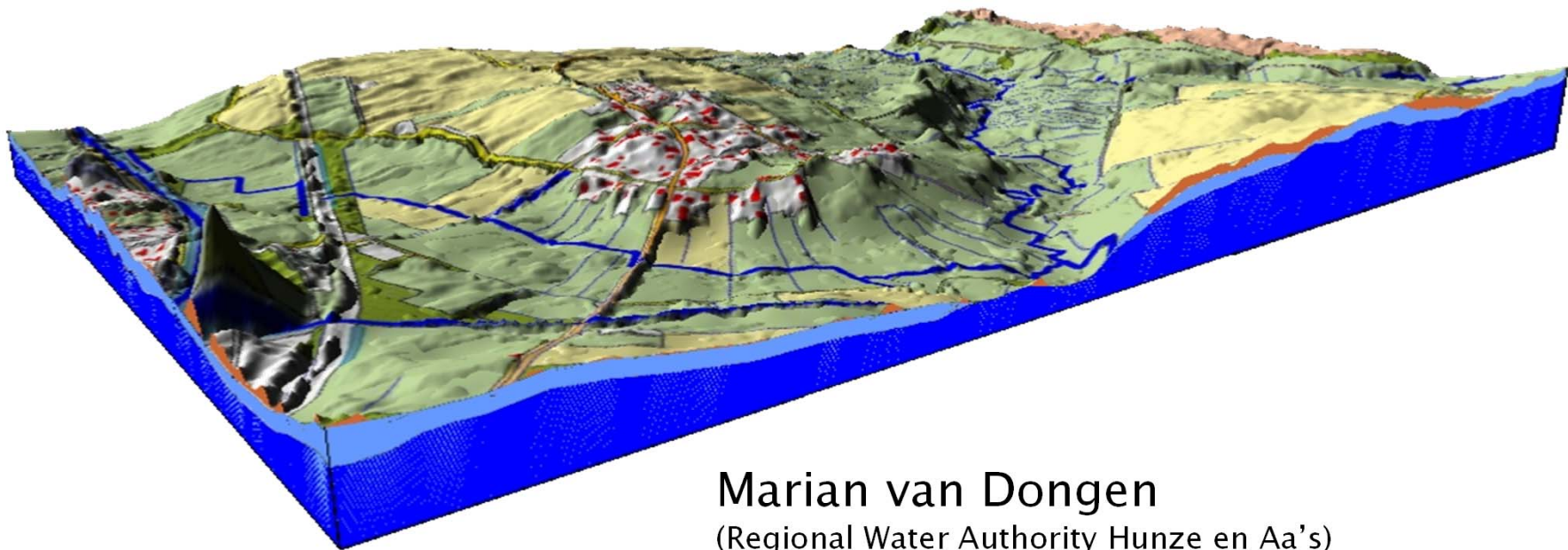


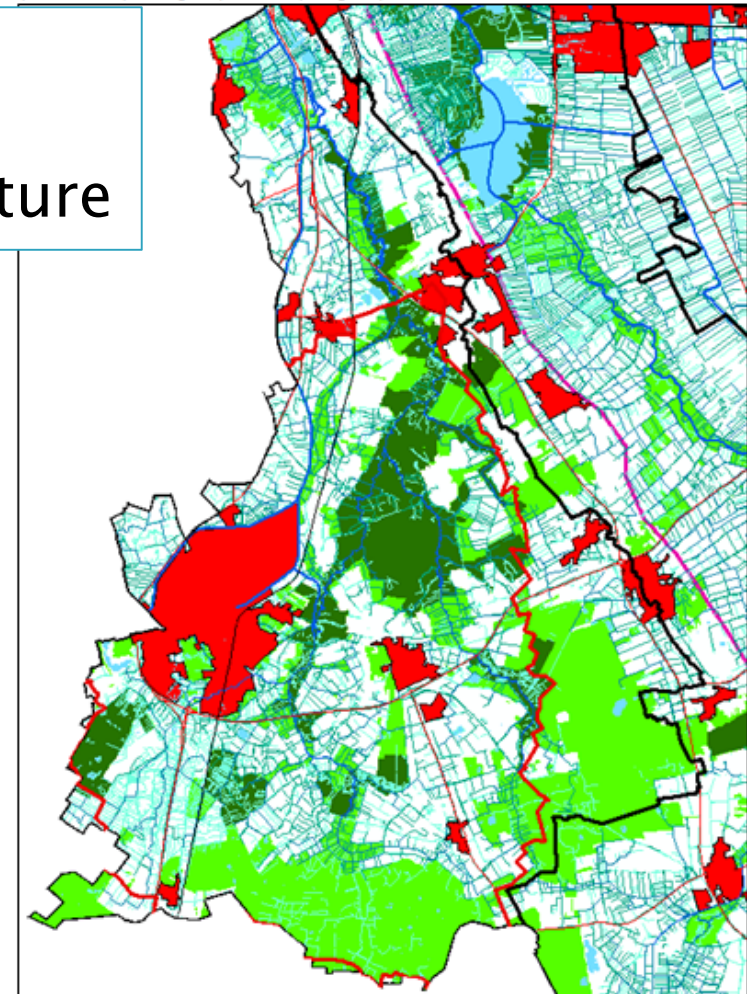
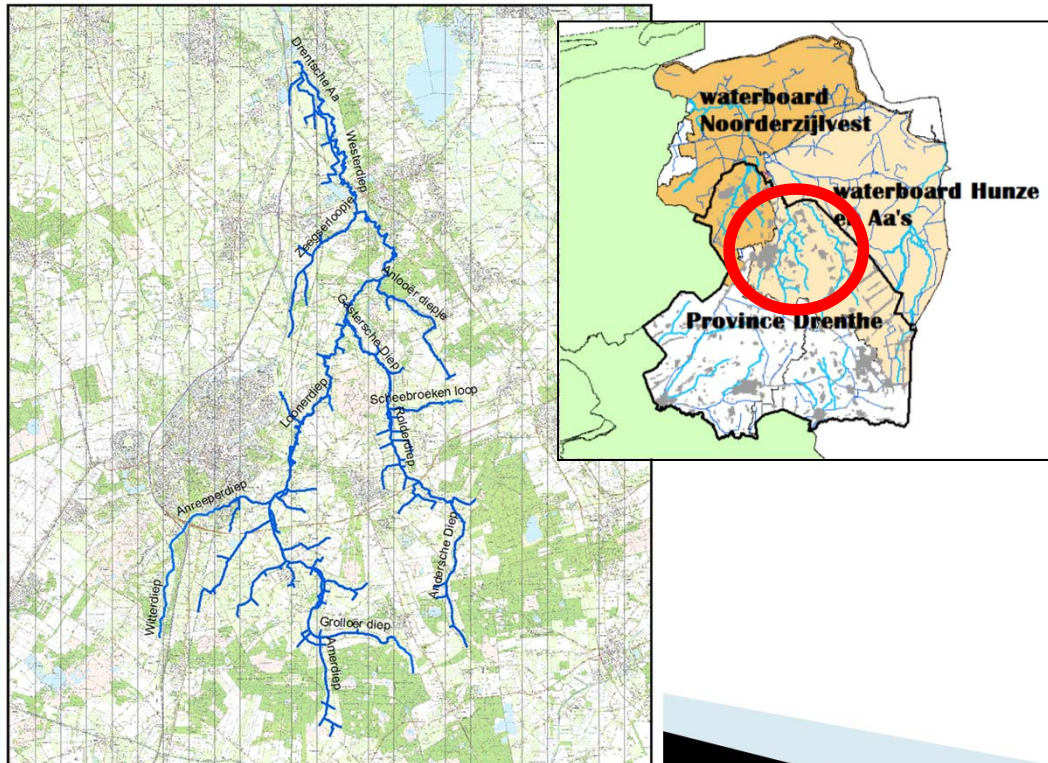
Climate proof Drentsche Aa



Marian van Dongen
(Regional Water Authority Hunze en Aa's)

Pilot area Drentsche Aa

- high plateau with a small river
- Catchment 300 km²
- mix of nature (N2000) and agriculture



Challenge:

how to make Drentsche Aa climate proof

Climate change issues:

- Increasing drought influences targets Nature 2000 area and possibilities for agriculture
- More risk on pollution river through run off and leaching nutrients and pesticides



Modeling



Ground water model study to determine:

- Effect of climate change on wet nature in river valley
- Effective mitigation measures for nature
- Areas for sprinkling from ground water (mitigating measure for agriculture)
(determine buffer zones around nature)

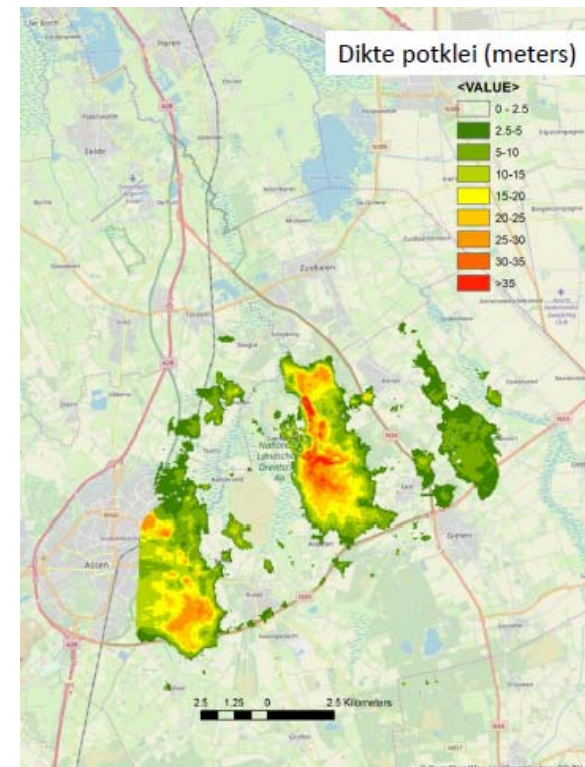
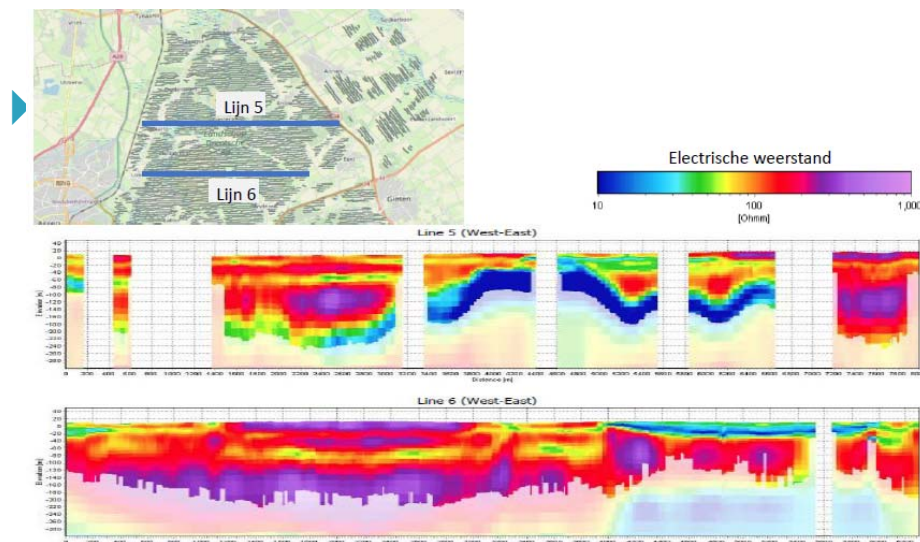
Waterquality model to determine:

- Risk maps (sources and routes of N and P and pesticides)
- Traveling time research
- Best measures (like bufferzones, sustainable soil management)
- The impact of climate change on leaching/ run off



SkyTem:

- ▶ Skytem data collected in Topsoil
- ▶ Data will be used to actualize models in the future



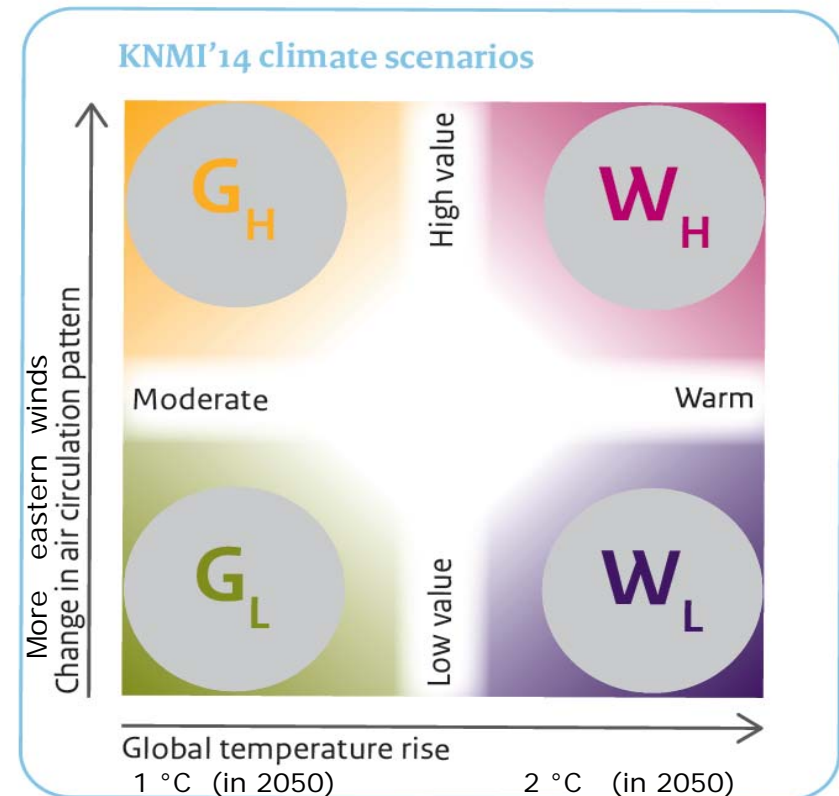
Climate Change Scenarios

Water quantity (for drought problems):

- Policy development: worst case CC scenario
most extreme dry scenario in 2050 (W_H)
- Stakeholder participation:
recent extreme dry year (2018)
(easier in communication, NZV)

Water quality

- Determine no-regret measures:
Most moderate CC scenario
(2050 G_L)



Stakeholder involvement:

- Create support from stakeholders:
 - Support for issues to be studied
 - trust in models used
 - support for final conclusions & follow-up actions
- Use output from meetings with stakeholder to determine best measures to be taken/ to be calculated
- Feed back of model results to stakeholders
- Take stakeholders advise serious, adapt your study to it!
(flexible budget and time planning!?!)



Policy maker meets farmers



Main results waterquantity

- Raise river beds
- Change coniferous forest into deciduous forests
- shallower & more intensive tube drains
- Irrigate from groundwater: more than 500 m from wet nature (max. 50 mm/year)



Main results waterquality

Heavy rainfall after applying pesticides (up to a week or even more) will give more leaching of pesticides

Permanent bufferzones (~4 m breed)
can diminish leaching
up tot 25 - 30 %



Follow up waterquantity



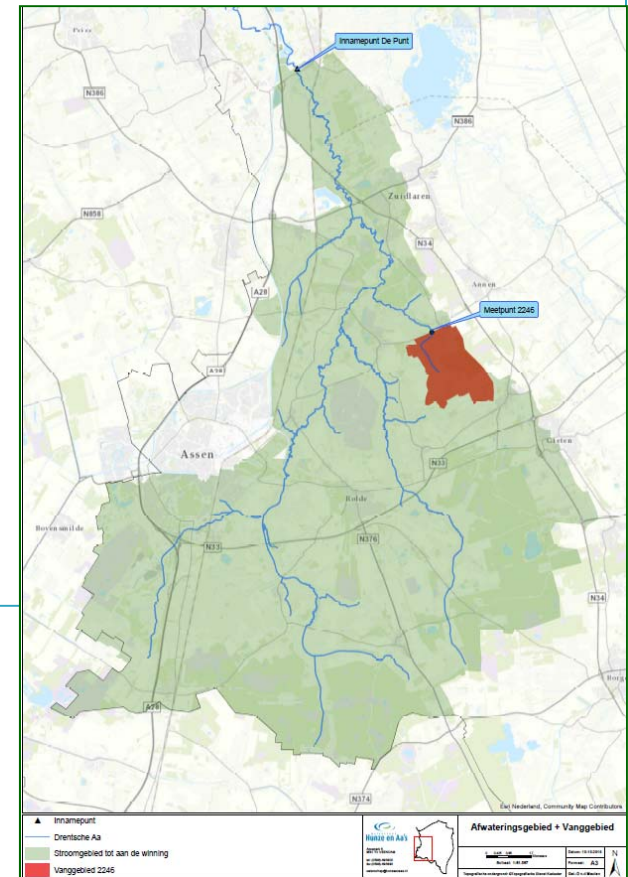
- Raising river beds:
pilot for 7 km; starts 2020
- Legislation sprinkling from groundwater: (2022)
*Stakeholder meeting: 4 November 2019
(will be continued in Topsoil II)*
- Shallower and more intensive drain tubes:
Detailed implementation study: started in 2019
- More flexible policy for nature types (+ forests):
(2020 -...?)
meeting at Province Drenthe 29-5-2019

Follow up waterquality

(will be continued in Topsoil II)



- Plotemissionplan on measures for each farmer
- Subcatchment based approach:
80 % of farmers participate
- Measures taken in 2020–2021
- Monitoring effect on waterquality



Lessons learned from Topsoil

- ▶ Skytem/TTEM: how to collect new geological data (DK)
- ▶ New machines to diminish runoff: Wonderwheel (UK)
- ▶ New measures to reduce flood risk in Urban Areas
- ▶ New approach to reduce leaching under maize (GE)

- ▶ More integrated approach: waterquality & Quantity
- ▶ How to organise stakeholder participation (UK)
- ▶ How to deal with Climate Change Scenarios (All)

- ▶ How to organise Legislation of groundwater extraction (All)

- ▶ How European rules & directives are being developed



Thank you for your attention

