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(in Dutch with English summary)

Abstract #236

National Institute for Public Health
and the Environment
Ministry of Health, Welfare and Sport

Impact of drought on nitrate in leaching water from agricultural fields in the Netherlands

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Research objective

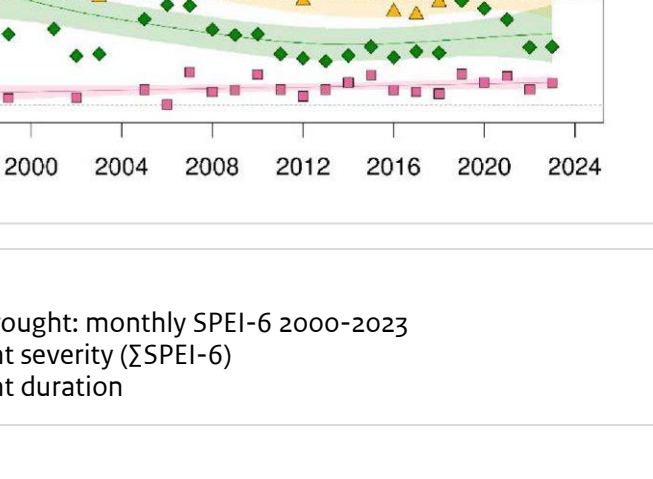
Climate change will lead to increased frequency of droughts.
We need to better understand the impact of drought on nitrate in leaching water from agriculture fields.

- Response NO_3 leaching to drought events
- Regional differences in responses to drought and what causes these differences

Dutch Minerals Policy Monitoring Programme

Aim: monitoring effects of manure policy

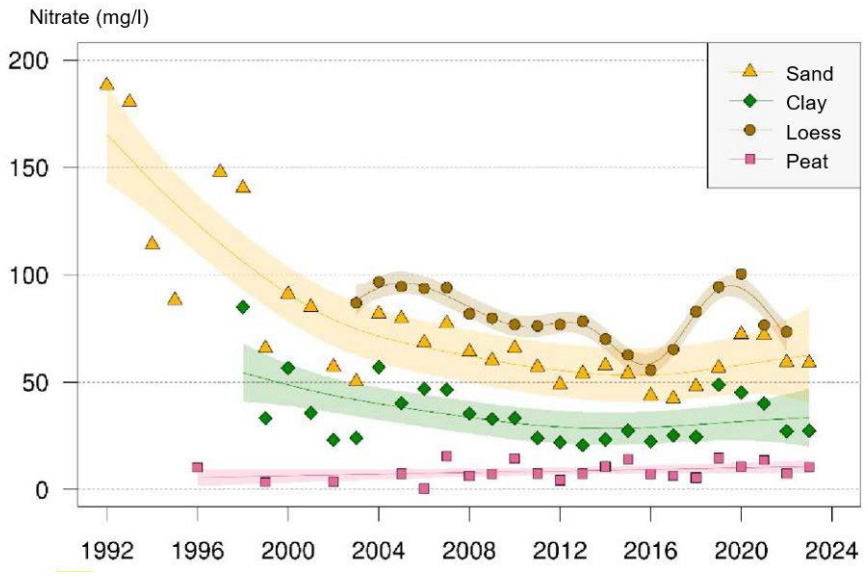
- 1991: EU Nitrates Directive (31/676/EEC)
- **1992**: Start Dutch Mineral Policy Monitoring Programme (LMM)
- Water quality (RIVM)
  - Leaching water
    - groundwater, tile drain or soil moisture
  - Ditch water
- Farm management practice (WSER[1])
- 450 farms across 11 regions



[1] Wageningen Social and Economic Research

Evolution of NO3 in leaching water under agricultural fields in the Netherlands

1992 ~ 2012: decline 2012 ~ 2018: stabilization 2018 ~ 2022: increase

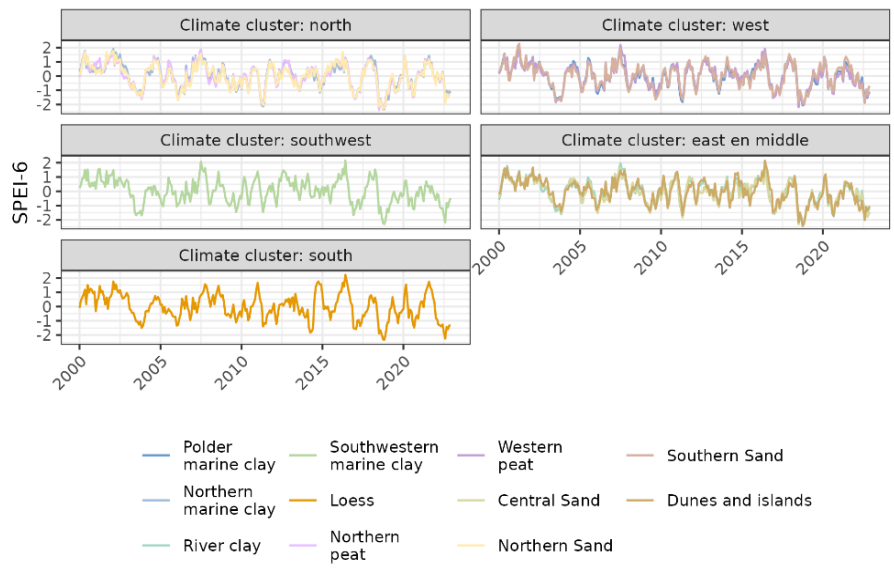


Conclusion

- The response of nitrate in leaching water after a drought is significantly influenced by:
  - Regional differences in precipitation and evaporation
  - Soil type and hydrological conditions
- Important to consider climate trends in the design of water quality monitoring. To provide information for implementing regional mitigation policies.

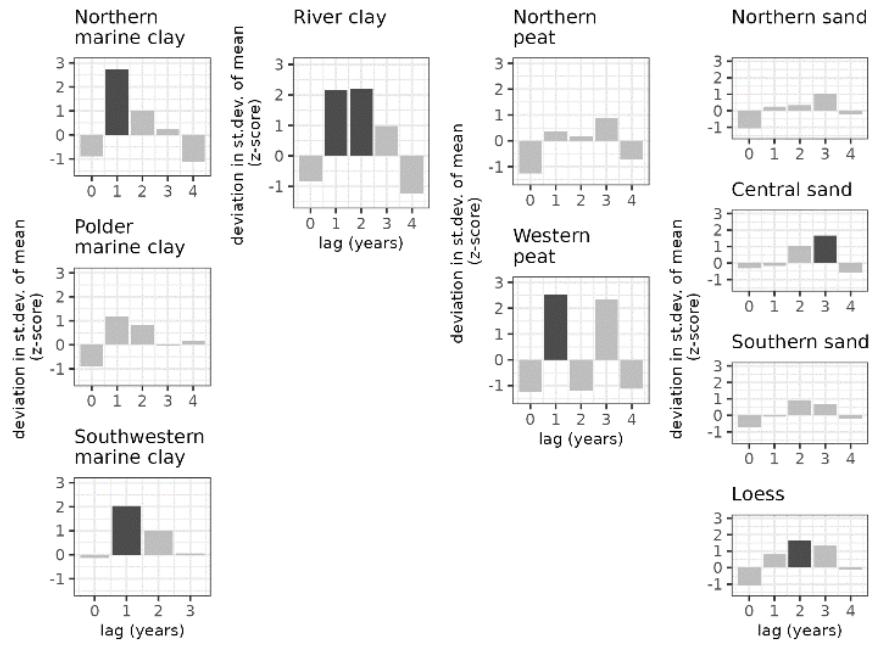
Regional differences in precipitation and evaporation

- Drought 2018/2019 exceptionally severe and long in all regions
- Regional weather differences between regions
- 5 regional clusters with similar weather patterns



NO_3 response to drought

- Significant influence by soil type and hydrological conditions
- Fast response in areas with drainage (mostly clay areas)
- Slower response in un-drained areas (sand and loess areas)
- 4 regional clusters with similar responses in NO_3 concentrations



Methods

- Hydrological drought: monthly SPEI-6 2000-2023
  - Drought severity (∑SPEI-6)
  - Drought duration
- Nitrate concentrations leaching water
  - Response to drought

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