

Distributed sub-field erosion modelling for the southern half of Sweden

Faruk Djodjic and Hampus Markensten

Department of Aquatic Sciences and Assessment, Swedish University of Agricultural Sciences, SLU

P.O. Box 7050, S-75007 Uppsala, Sweden

faruk.djodjic@slu.se



OBJECTIVE

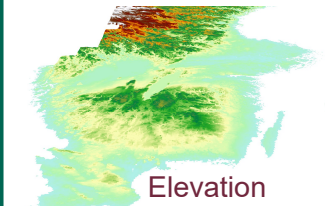
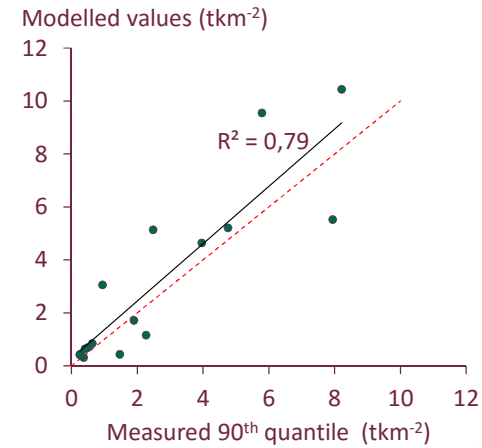
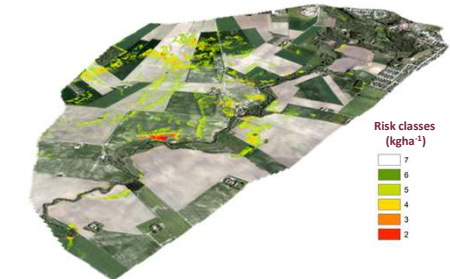
Generate decision support maps for an improved placement of countermeasures to reduce eutrophication (e.g. vegetation buffer strips, constructed wetlands, structural liming) in order to increase their cost-efficiency

BACKGROUND AND INPUT DATA

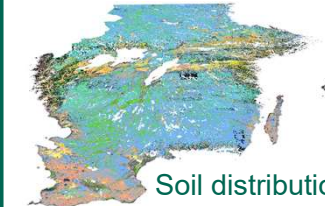
- Modelled area: 202 279 km²
- Covering 90.4 % of Swedish agricultural land
- High resolution elevation data (2x2m)
 - Flow direction and accumulation
 - Slope and slope length
 - Plan and profile curvature
- Soil map
 - Soil erodibility
 - Soil permeability
- Land use map
 - Vegetation cover factor
- Water discharge
 - Erosion-sensitive spring flow (February - April)
- "Worst-case" scenario:
 - All arable land as winter wheat crop
- Modified Unit Stream Power Erosion Deposition (USPED) model within PCRaster environment

RESULTS

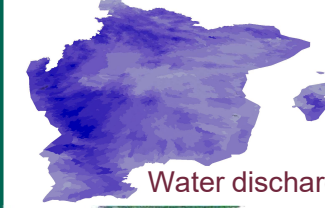
- Gross erosion (kg ha⁻¹), illustrating the areas vulnerable to mobilization of soil particles
- Flow-accumulated erosion rates (tkm⁻²), showing how water and in water suspended soil particles accumulate and transport in the landscape
- Reasonable agreement with measured load values of suspended sediment (90th quantile of measured monthly values) from 16 small catchments (2-33 km²) dominated by agricultural land



Elevation



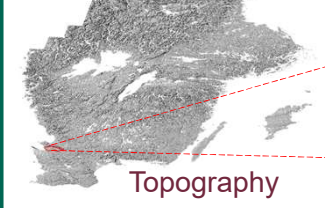
Soil distribution



Water discharge



Land use



Topography

261 km²



6.2 km²

Read more:



Djodjic, F. and A. Villa (2015). Distributed, high-resolution modelling of critical source areas for erosion and phosphorus losses. [AMBIO 44\(2\): 241-251.](#)



Djodjic, F., H. Elmquist and D. Collentine (2017). Targeting critical source areas for phosphorus losses: Evaluation with soil testing, farmers' assessment and modelling. [AMBIO 47\(1\): 45-56.](#)