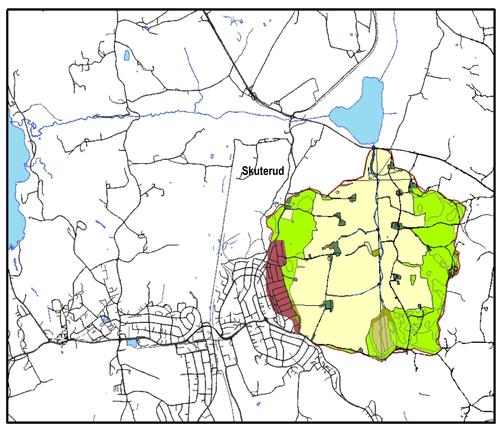
Skuterud catchment

Norway

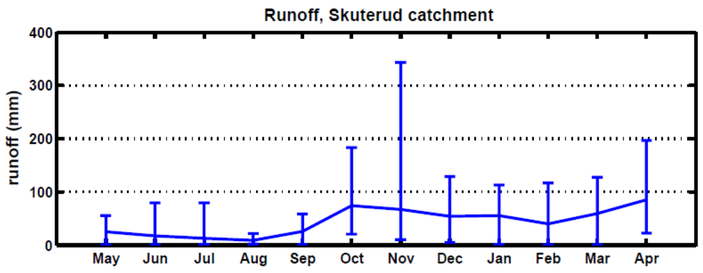
Basin characteristics

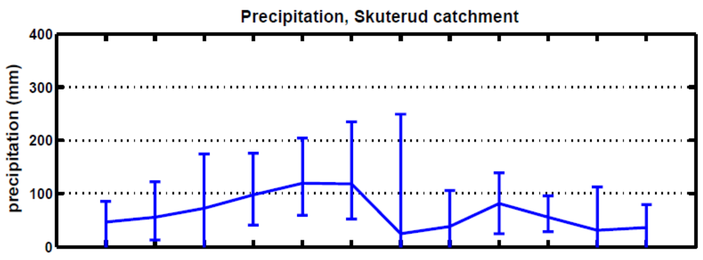
River Basin / River Basin (according EU-WFD)	Skuterud catchment
Operation (from… to…)	From 1993 - present
Gauge coordinates / Gauge datum:	30 km south of Oslo.
Catchment area:	4.5 km^2.
Elevation range:	91 – 146 m. above mean sea level
Basin type: (alpine, mountainous, lowland)	Lowland
Climatic parameters: (mean precipitation, temperature and others)	Mean precipitation; 785 mm. Mean air temperature; 5.3 °C
Land use:	Agriculture
Soils:	Silt loam, silt clay loam, loamy sand
Geology:	Marine deposit
Hydrogeology: (Type of aquifers, hydraulic conductivity)	Low hydraulic conductivity
Characteristic water discharges: (Q_{min}, Q_{max}, Q_{mean})	Q_{min} = ± o $m^3 s^{-1}$, Q_{max} = 4,3 $m^3 s^{-1}$, coeff. var.= 239 %

Map of the research basin



Mean hydrograph / Pardé flow regime





Special basin characteristics (hydrogeology, lakes, reservoirs etc.)

The Skuterud catchment

Land use	Area (ha)
Arable land	272
Forested area	129
Urban/other	38
Total area	449

The Skuterud catchment is part of the JOVA-programme, the Norwegian Agricultural Environmental Monitoring Programme

The catchments represent different climatological conditions and agricultural practices as well as different geo-hydrological settings. Agriculture with cereals is the dominating land use form in the many of the catchments in the national monitoring programmes.

In general, the Norwegian catchments are intensively drained, with a drain spacing of 8 – 10 m and a drain depth 0.80 – 1 m.

Instrumentation and data

Measured hydrological parameters	Measuring period	Temporal resolution	Number of stations
Discharge	1993 – present	30 min – 1 hr resolution	3
Precipitation, temperature, rel. hum., solar radiation, wind speed, soil temperature, snow depth	1950 – present	1 hr - daily	4
suspended solids, tot-N, tot-P, NO3, PO4, turbidity, EC, pH, more	1993(2006) - present	14 day average, 30 min – hour	3

Applied models

1.SWAT (water balance, nutrient and soil loss)
The SWAT model has also been applied in Norway as part of EuroHarp and Striver, two EU – projects (large scale). The model is tested in Skuterud.
Needs modification (saturation from below, subsurface drainage, winter)

2. DRAINMOD, developed at NCSU (Skaggs) simulating subsurface drainage/surface runoff/nitrogen dynamics

3. HBV – model (hydrology)

4. INCA – model (hydrology, nutrient dynamics)

5. SOIL/SOIL_NO and COUP (hydrology,nitrogen), have been tested.

6. WEPP (Water erosion prediction model) tested on small plots

Main scientific results

1. Yearly catchment discharge shows a high variation and is extremely outlier prone.

2. Large in-day variation in discharge occurs during periods with excess rainfall/snowmelt.

3. A large difference exists in specific discharge when calculated on average daily and hourly discharge values respectively.

4. 50 - and 90 % of the yearly runoff is discharged in 28 and 141 days respectively. The same applies for nitrogen. Phosphorus and suspended solids are discharged in less days due to being linked to extreme events.

5. No major runoff, erosion and nutrient loss occurs during the growing season

6. The construction of wetland at catchment outlet has a significant effect on reducing loss of suspended solids and total phosphorus. The effect on reduction of nitrogen loss is negligible.

Key references for the basin

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