Devise strategies and modelling tools to target the objectives of the EU Nitrates Directive and to enhance agricultural water management

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SMAQua: smart ICT tools for efficient water use

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Mitigating the impacts of agricultural production on water resources

Development of a tool for simulating nitrogen cycle in the soil

The Nitrogen Cycle

Overview of the modelling approach

Flow through the unsaturated zone

Vertical flow through the unsaturated zone (UZF MODFLOW package)

Nitrogen cycle

Transformation processes in the soil for each N pool (ANIMO model + EPIC approach for NO₃ crop uptake)

Flow and Transport in the saturated zone

NO₃ concentration simulated at the water table is treated as a mass source to the saturated zone (MT3DMS code)

How ANIMO works (Agricultural Nutrient Model)

1st equation NH₃

mineralization

2nd equation NH₄⁺
nitrification

3rd equation NO₃⁻

How?