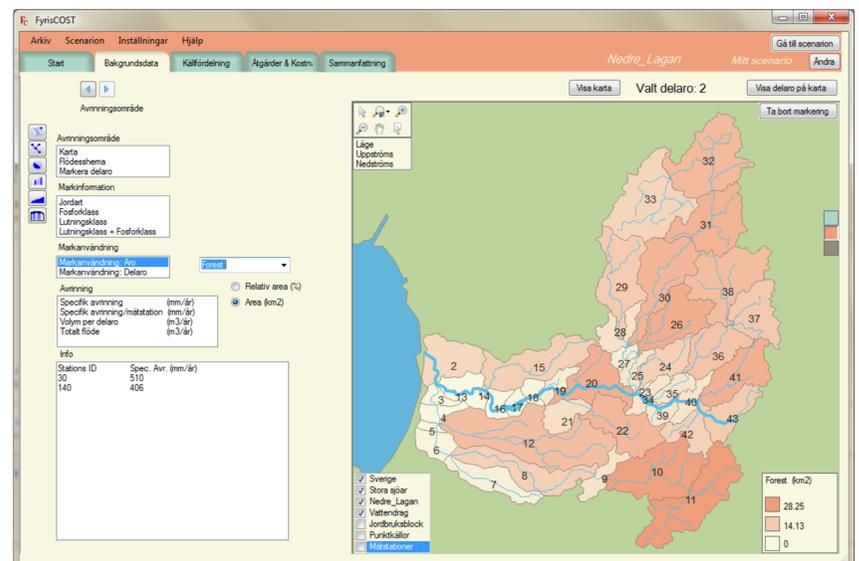


Developing catchment level measures to reduce eutrophication: The crop rotation coefficient calculator in the DSS FyrisCOST

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FyrisCOST

FyrisCOST is a PC-based catchment scale decision support system (DSS) for the evaluation of alternative nutrient mitigation strategies. The model is able to evaluate a range of mitigation approaches for P and N from point and diffuse sources. FyrisCOST also contains measures involving changes in land use, such as the construction of wetland areas in key positions. This allows cost efficiency to be estimated for a catchment based on the combination of a wide range of measures.

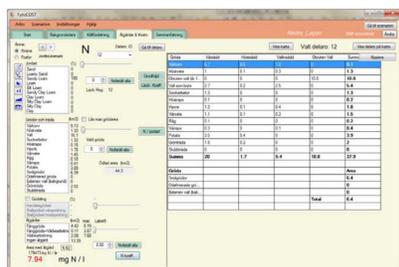


Nitrogen mitigation

FyrisCOST calculates nitrogen concentrations in effluent water for each sub-catchment. The concentration of nitrogen is dependent on the current land use and geographical conditions. In order to evaluate agricultural scenarios in FyrisCOST, a "crop rotation coefficient calculator" for estimating N leaching from agricultural land was constructed. The calculation includes crop rotations and tillage systems and differentiates between annual and perennial crops. The system is able to take into account that a primary crop is followed by a specific crop/tillage system and estimate the effect of this on nutrient losses. The crop rotation coefficient calculator provides a localised estimation of leaching from cropland depending on the crop distribution. This makes it possible for stakeholders to include crop distribution in catchment mitigation programs.

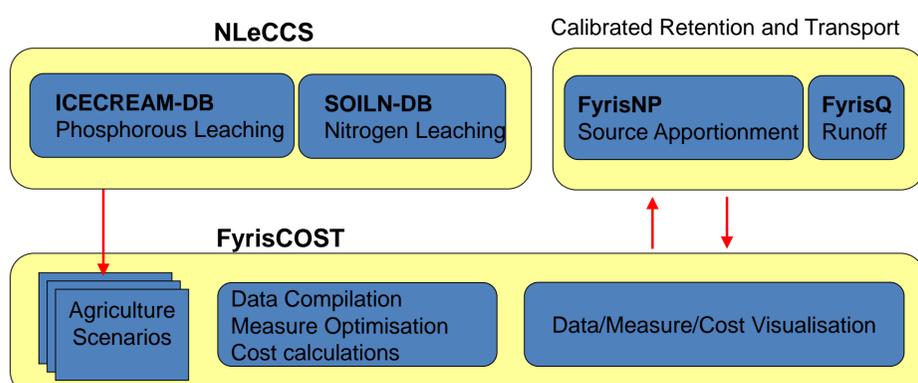
Available N measures:

- Changed crop distribution
- Changed land use
- Changed fertilisation regime
- Catch crop and/or spring tillage
- Constructed wetlands
- Changes in household septic systems



System structure

Data used in FyrisCOST is derived from an array of field to catchment scale models used by the SLU water HUB. Nutrient flows in the FyrisCOST system are built on the semi-distributed model FyrisNP and nutrient losses are derived from simulations by the Nutrient Leaching Coefficient Calculation System (NLeCCS) which includes the ICECREAM-DB model for estimating P leaching and the SOILN-DB model for nitrogen leaching from arable soils.



Phosphorous mitigation

FyrisCOST calculates P losses from agricultural land based on region, soil type, crop distribution, point sources and measures. FyrisCOST contains a national database including (1) all agricultural fields within 30 meters from a waterway and (2) all of those areas that currently have buffer strips (baseline scenario). FyrisCOST also contains detailed information about buffer strip efficiency based on buffer width and slope. The model calculates the maximum potential buffer strip area in each sub-catchment based on crop distribution.

Available P measures:

- Changed crop distribution
- Changed land use
- Buffer strips
- Constructed wetlands
- Changes in household septic systems

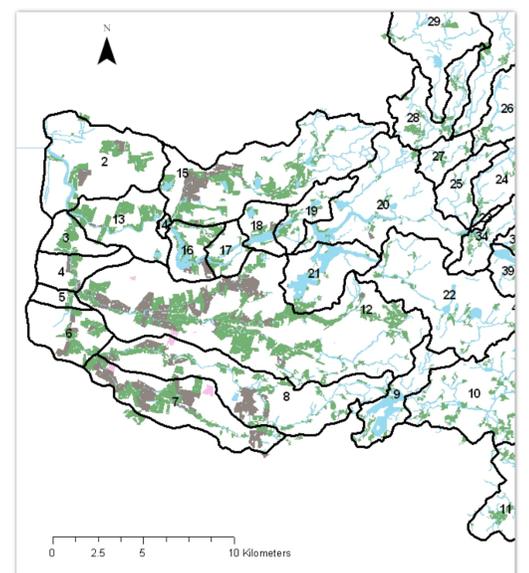


Figure: Lower Lagan catchment in Sweden: green areas are agricultural fields within 30 m of waterways, grey areas are those fields currently with buffer strips.

Further information



Please approach me for more information and live demonstration of FyrisCOST.

