8. TargetEconN

FAIRWAY partner: Berit Hasler (AU, DK)

Indsæt logo

Brief description	
The TargetEconN model is an integrated economic and biophysical social planner model which minimizes the costs of meeting a nutrient load reduction target in a specific water body. The model is calibrated for 88 coastal catchments, comprising the Danish territory. The model is also set up for lake catchments. The model is used to advise the Ministry of Environment and The Ministry of Food, Agriculture and Fisheries, on cost-effective nitrogen and phosphorus abatement to achieve load reduction targets for coastal water bodies and lakes.	
Contaminants covered (e.g. nitrate, pesticides etc.)	Nitrogen and phosphorus. A model version is set up to cover effects on pesticide use from the implementation of nitrogen abatement measures.
Intended end users (e.g. farmer, water quality manager, policy maker)	Intended use of results: Policy makers
Level of expertise and/or training required	Experience with linear programming models or the like is beneficial for running the model , as well as access to the software GAMS
Geographical resolution (e.g. field, catchment, national)	The model is set up for 88 coastal catchments, that together comprise the total Danish area, and the model is also subdivided on lake catchments. The model can also be run for the 22 main catchments. The spatial resolution for the data inputs is field level, and the optimisation takes place at catchment level.
Temporal resolution (e.g. daily, annual, long-term).	Annual
Real-time component (e.g. live weather data, soil moisture data feeds etc.)	Soil quality data (clay, sand), retention data, crops at field level, fertiliser application at field level
Number and type of mitigation measures included	24
Platform (e.g. paper-based tool, phone app, bespoke software).	The model is set up in GAMS which is software for optimisation (in English).
Frequency of updates	It is currently updated upon demand from the Ministry, updates are dependent on end-user demand, use in research projects and alike.
Cost/availability	Use of the model requires expert consultation
Number of users or number of copies distributed/ downloaded/purchased	The main users are researchers at AU (4-5 users), but the results are used by the Ministry
Links to demo material and other relevant information (e.g. user guides).	http://dnmark.org/wp-content/uploads/2017/03/Fact-sheet-TargetEconN-modelling-framework_Final.pdf
Additional comments	

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Input data required to run the DST	Load reduction targets for N and P; can be run for only N or P.
Outputs (including links to water quality and economic or financial aspects)	Abatement costs for nutrient reductions in a catchment and total costs for the whole country; load reduction achieved per catchment and in total; costs and effects down to field level; cost-effectiveness ratio; distribution of abatement measures at field level.
Age/provenance of supporting data used to develop the DST	The model is set up using data from 2013-2018 for crops grown at field level (average of 5 years) and fertiliser use. Retention data from 2020.
Country-specific calibration or data requirements (including restrictions on use)	To calibrate the model to other countries detailed catchment data are needed on crops, fertiliser application, and retention in the catchment.
Details of validation and testing	The model is being tested and validated in 2021, and results are compared with another cost-effectiveness model SMART used in Denmark. The model inputs for the two models are consistent, and differences in model outputs and results are discussed and explained in a Danish report, planned for publication in August 2021.
Date developed/released (or planned release date)	Planned release data for validated national model , including N and P, is august 30th, 2021
Author/developer names and affiliations	Berit Hasler, Aarhus University
Member state(s) where developed	Denmark
Member State(s) where currently used	Denmark
Key publication references (including url)	Hasler, B, Hansen, LB, Andersen, HE & Termansen, M 2019, 'Cost-effective abatement of non-point source nitrogen emissions: The effects of uncertainty in retention', Journal of Environmental Management, vol. 246, pp. 909-919. https://doi.org/10.1016/j.jenvman.2019.05.140 http://dnmark.org/wp-content/uploads/2017/03/Fact-sheet-TargetEconN-modelling-framework_Final.pdf

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Any other useful information (e.g. screenshots of DST input/outputs)	
Indsæt illustration eller lign.	