



CASCADE model predicts exposure at different locations within catchments

Theme: Water framework directive

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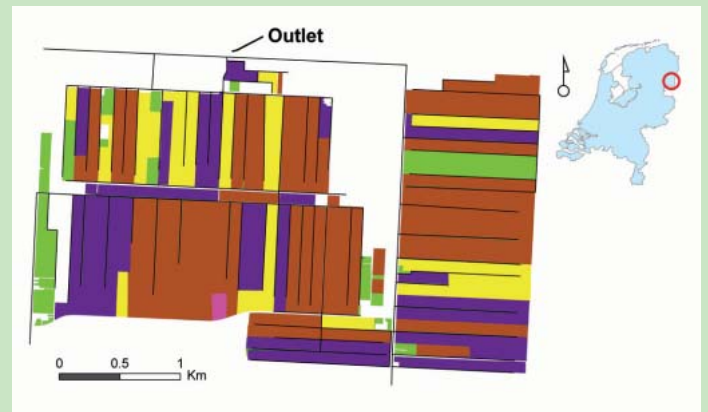
Problem

Aquatic life is protected from pesticide stress by two EU directives. It is not clear whether the ecotoxicological criteria from both directives can be met and what will be the consequences for Dutch agriculture. The two directives are:

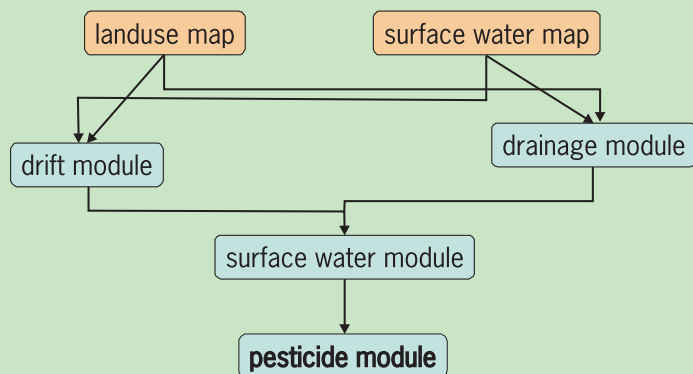
- 91/414/EEC: placing of Plant Protection Products on the market
- 2000/60/EC: Water Framework Directive
- The former evaluates ecotoxicological criteria at edge-of-field level, while the latter considers larger waterbodies (catchments > 10 km²).

Approach

In this project we obtain insight in exposure concentrations at the two scale levels. We develop the CASCADE model, using as much as possible existing models. We parameterize an example catchment, the 10 km² Drentse Veenkoloniënpolder, and we calculate how spray drift deposits on watercourses flow towards the single polder outlet.



Drentse Veenkoloniënpolder with its main crops potatoes (brown), sugar beets (purple) and cereals (yellow). The single outlet of the polder is situated in the top centre of the area.



Components of the CASCADE model to predict pesticide exposure concentrations in a network of watercourses.

Results

First calculation results show that pesticide concentrations in edge-of-field watercourses are diluted downstream by mixing with water from other watercourses.

Future use in risk assessment

Results of the CASCADE model will be applied to evaluate the various political options regarding the protection level of aquatic life in the Netherlands. The ultimate aim is to develop a model that helps evaluating risks at edge-of-field level as well as in larger waterbodies before pesticides are registered in the Netherlands.

Communication 2008

Model development and its applications in the future registration procedure are being discussed in the Dutch work group 'Exposure aquatic organisms'.



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